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Unit :16: Working Capital Management

Introduction

For any business normally there are two types of capitals are required. One is investment in fixed assets which is of long term in nature, While other is working capital which is required for day to day running of the business. Working capital is also known as current capital, circulating capital, and floating capital. It is a short term capital and constantly converted into cash. The element of risk is comparatively less in working capital. Though, it contains a larger degree of liquidity, a part of it is permanently locked up in the business. Working capital will be the difference of investments in current assets and current liabilities. Working capital management is a significant in Financial Management due to the fact that it plays a great role in keeping the wheels of a business enterprise running. If working capital is not properly managed it may affect the smooth running of the business. Working capital management is concerned with short term financial decisions. Shortage of funds for working capital has caused many business to fall and in many cases, has retarded their growth. Lack of efficient and effective utilisation of working capital leads to earn low rate of return on capital employed or even compels to sustain losses. The need for skilled working capital management has thus become greater in recent years.

Now a days it is difficult to find a firm where working capital is not required. The requirement of working capital varies from firm to firm depending upon the nature of business, production policy, market conditions, seasonally of operations, conditions of supply etc. Working capital to a company is like the blood to human body, which requires constant circulation in the business. If working capital management is carried out effectively, efficiently and consistently, will assure the health of an organisation.

Structure of the Chapter:

- 16.1 Objectives:
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16.1 Objectives:

At the end of this chapter the student will learn about –

- Concept of working capital
- Objects and need of working capital
- Operating cycle concept
- Calculation of working capital
- Working capital requirement in special circumstances like seasonal business, inflation
- Strategies for working capital

16.2 Working Capital : Meaning

Working Capital is defined as the excess of current assets over current liabilities. Current assets are those assets which will be converted into cash within the current accounting period or within the next year as a result of the ordinary operations of the business. They are cash or near cash resources. These include:

- Temporary investments
- Prepaid expenses
- Receivables
- Short term advances
- Inventory
 - o Raw materials, stores and spares
 - o Work-in-progress
 - o Finished goods
- Cash and Bank balance

The value represented by these assets circulates among several items. Cash is used to buy raw-materials, to pay wages and to meet other manufacturing expenses. With the use of such raw-materials, wages and other manufacturing facilities finished goods are produced. These are held as inventories. When these are sold, accounts receivables are created. The collection of account receivable brings cash into the firm.

Current liabilities are the debts of the firms that have to be paid during the current accounting period or within a year. These include:

- Other liabilities maturing within a year.
- Advances received against sales
- Outstanding expenses i.e. expenses due but not paid
- Short term borrowings
- Taxes and dividends payable
- Creditors for goods purchased

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.

In simple term, It is the difference between current assets and current liabilities (excluding short-term debt). Used to evaluate the liquidity of a company and how well it is positioned to fund operations in the short-term using cash and other assets convertible to cash.

Working Capital = Current assets – Current Liabilities

16.3 Objective of Working Capital Management

Working capital management involves the relationship between a firm's short-term assets and its short-term liabilities. The goal of working capital management is to ensure that a firm is able to continue its operations and that it has sufficient ability to satisfy both maturing short-term debt and upcoming operational expenses. The management of working capital involves managing inventories, accounts receivable and payable and cash.

The basic objectives of working capital management are as follows:

- With the help of working capital management the firm can manage its current assets in such a way that the marginal return of investment in these assets is not less than the cost of capital employed to finance the current assets.
- Second important objective of working capital management is that the company should always be in a position to meet its current obligations which should properly be supported by the current assets available with the firm and so the company's operations do not stop due to lack of working capital.
- By proper working capital management a company can reduce the locking up of funds in working capital and thereby it can improve the return on capital employed in the business.

16.4 Gross and Net Working Capital

Generally the working capital has its significance in two perspectives - 'Gross working capital' and 'Net working capital', the term 'Gross working capital' refers to the firm's investment in current assets. The term 'Net working capital' refers to the excess of current assets over current liabilities.

On the basis of time working capital can be classified in two ways viz., 'Permanent' and 'Temporary'. Permanent working capital represents the assets required on a continuing basis over the entire year, whereas temporary working capital represents additional assets required at different times during the operation of the year. Generally a firm will finance its seasonal and current fluctuations in business operations through short-term debt financing. For example, in peak season, more raw materials to be purchased, more manufacturing expenses to be incurred, more funds will be locked in debtors' balance etc. In such times excess requirement of working capital would be financed from short-term financing sources.

Permanent component of 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 Current Assets'. Core Current Assets are those required by the firm to ensure the continuity of operation which represents the minimum levels of various items of current assets viz., stock of raw materials, stock of work-in-progress, stock of finished goods, debtors' balances, cash 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 current assets will be financed by the short-term financing. Sometimes core current assets are also referred to as 'hard core working capital'.

The management of working capital is concerned with maximizing the return to shareholders within the accepted risk constraints carried by the participants in the company. 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.

16.5 Disadvantages of Insufficient Working Capital

The disadvantages suffered by a company with insufficient working capital are as follows:

- There may be concerted action by creditors and will apply to court for winding up.
- The advantages being able to offer a credit line to customers are foregone.
- Trade discounts and cash discounts are lost. A company with ample working capital is able to finance large stocks and can therefore place large orders.
- Financial reputation can be lost due to non-cooperation from trade creditors in time of difficulty.
- The company is unable to take advantage of new opportunities or adapt to changes.

16.6 Operating Cycle Concept

A new concept which is gaining more and more importance in recent years is the 'Operating Cycle Concept' of Working Capital. The operating cycle refers to the average time elapses between the acquisition of raw materials and the final cash realization.

A useful tool for the small-business owner is the operating cycle. The operating cycle analyzes the accounts receivable, inventory and accounts payable cycles in terms of days. In other words, accounts receivable are analyzed by the average number of days it takes to collect an account. Inventory is analyzed by the average number of days it takes to turn over the sale of a product (from the point it comes in your door to the point it is converted to cash or an account receivable). Accounts payable are analyzed by the average number of days it takes to pay a supplier invoice.

Most businesses cannot finance the operating cycle (accounts receivable days + inventory days) with accounts payable financing alone. Consequently, working capital financing is needed. This shortfall is typically covered by the net profits generated internally or by externally borrowed funds or by a combination of the two.

Cash is used to buy raw materials and other stores, so cash is converted into raw materials and stores inventory. Then the raw materials and stores are issued to the production department. Wages are paid and other expenses are incurred in the process and work-in-progress comes into existence. Work-in-progress becomes finished goods. Finished goods are sold to customers on credit. In the course of time, these customers pay cash for the goods purchased by them. 'Cash' is retrieved and the cycle is completed. Thus, operating cycle consists of four stages:

- The receivable stage
- The finished goods inventory stage
- The work-in-progress stage
- The raw materials and stores inventory stage

The operating cycle begins with the arrival of the stock, and ends when the cash is received. The cash cycle begins when cash is paid for materials, and ends when cash is collected from receivables.

Importance of Operating Cycle Concept – On the basis of working capital concept a firm can determine its working capital requirement. This is an important concept because the longer the operating cycle, the more working capital funds the firm needs. Moreover, the management should ensure that the wheels of working capital cycle should run for as many time as possible during a year. Management must ensure that this cycle does not become too long. This concept more precisely measures the working capital fund requirements, traces its changes and determines the optimum level of working capital requirements.

16.7 Factors determining Working Capital Requirement

There are no given set of factors on the basis of which we can determine working capital requirement of any particular firm but following factors definitely influence the need level of working capital.

- **Nature of business:** Quantum of working capital will depend more or less on the nature of the business. If we look at the Balance sheet of any trading organisation, we find major part of the resources are deployed on current assets, particularly stock-in-trade. Whereas in case of a transport organisation major part of funds would be locked up in fixed assets like motor vehicles, spare and working shed etc. and the working capital component would be negligible. The service organisation or public utilities need lesser working capital than trading and financial organisation. Therefore, the requirement of working capital depends upon the nature of business carried by the organization.
- **Manufacturing Cycle:** Manufacturing cycle is the time required to convert raw materials into finished goods. This cycle determines the need of working capital. If this cycle is longer then more working capital is required and vice versa. Management should take all measures to keep this cycle as short as possible.
- **Business Cycle Fluctuation:** It is another factor which determines the need of working capital level. Barring exceptional cases, there are variations in the demand for goods/services handled by any organisation. Economic boom or recession etc., have their influence on the transactions and consequently on the quantum of working capital required. In boom economic conditions more will be the demand requiring more production, more raw material and more blockage of funds in working capital. But in the time of recession in the economy, conditions will be reversed.
- **Seasonal Variations:** This factor affects the working capital requirement of seasonal business. e.g. There are woollen 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.
- **Scale of Operations:** Operational level determines working capital demand during a given period. Higher the scale, 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 turnover rate necessitates larger investment.

- **Credit Policy:** Credit policy of the business organisations 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 other component in credit policy of the suppliers, their terms and conditions of credit. Trade credit has its historical presence in the trading world. Availability of normal credit suppliers as well as trade credit facilitate working capital supply and reduce the need for bank finance. Management should try to restriction in giving credit to customers and should take credit as much as possible from creditors for reduction in investment in working capital.
- **Growth and Diversification of Business:** Growth and diversification of business call for larger volume of working fund. 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.
- **Supply Situation:** If easy and regular supply of raw material is available then there is no need of contingency plan and even no need for precautionary steps in inventory management. 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.

16.8 Assessment of Working capital Requirement in Seasonal Industries

In the seasonal industries the level of working capital requirement will not be similar all through the year. In times of off-season, the working capital requirement will be low and therefore the levels of investment in current assets and liabilities are very low. But, during season, the firm's requirement of working capital is at peak level. Let us look at the sugar industry. The crushing season in a year will remain for 5 to 6 months time. During the season the plant is expected to work at full capacity with triple shift working and the requirement of stocks of raw material is very high and resultant increase in stocks of sugar. The requirements for payment of labour expenses and maintenance is also higher. There will not be immediate sales of sugar and finished stock inventory would be much higher.

After the completion of the crushing season, the plant will be closed and only upkeep and maintenance of plant will be incurred and the level of current assets and current liabilities comes down and the working capital requirement would be very low. For efficient management of working capital, the Finance manger should be able to properly estimate the season and off-season requirements of working capital. For this he has to take the following precautions:

- Care to be taken to reduce the level of investments in current assets after the season in completed.
- Proper and careful assessment of working capital requirements for the season and off-season requirement.

- Make proper arrangement for meeting the contingencies of higher level requirement than the projected levels of requirement.
- Make proper arrangements with the banks and other sources of finance to meet the short-term needs of season.
- Preparation of projected cash flow statement showing the cash flow for peak season, normal season and off-season requirements.

16.9 Impact of Inflation on Working Capital Requirement

When the inflation rate is high, it will have its direct impact on the requirement of working capital as explained below:

- Increase in investments in current assets means the increase in requirement of working capital without corresponding increase in sales or profitability of the firm.
- Increase in valuation of closing stocks result in showing higher profits but without its realization into cash causing the firm to pay higher tax, dividends and bonus. This will lead the firm in serious problems of funds shortage and firm may be unable to meet its short-term and long-term obligations.
- Inflation will result in increase of raw material prices and hike in payment for expenses and as a result, increase in balance of trade creditors and creditors for expenses.
- Inflation will cause to show the turnover figure at higher level even if there is no increase in the quantity of sales. The higher the sales means the higher levels of balances in receivables.

Keeping in view of the above, the Finance Manager should be very careful about the impact of inflation in assessment of working capital requirements and its management.

16.10 Impact of Double Shift Working on Working Capital Requirement

If the firm which is presently running in single shift, plans to go for working in double shift and following factors should be considered while assessing the working capital requirements of the firm.

- The fixed expenses will increase with the working on double shift basis.
- Increase in production to meet the increased demand which will also increase the stock of finished goods. The increase in sales means increase in debtors balance.
- With the increase in raw materials requirement and expenses, the raw material inventory and work-in-progress will increase simultaneously the creditors for goods and creditors for expenses balance will also increase.
- Increase in production will result in increased requirement of working capital.
- Working in double shift means requirement of raw materials will be double and other variable expenses will also increase drastically.

The Finance Manager should reassess the working capital requirements if the change is contemplated from single shift operation to double shift.

16.11 Overtrading

Overtrading arises when a business expands its operations beyond the level of funds available. Overtraded means an attempt to finance a certain volume of production and sales with inadequate working capital. If the company does not have enough funds of its own to finance stock and debtors and still if it wishes to expand its operations by borrowing from creditors and from the bank on overdraft then sooner or later such expansion, financed completely by the funds of others, will lead to a chronic imbalance in the working capital ratio.

Expansion is advantageous so long as the business has the funds available to finance the stocks and debtors involved. Overtrading begins at the point where the business relies on extra trade credit and increased turnover are financed by taking longer periods of credit from suppliers and/or negotiating and extension of overdraft limits with the Bank. Over dependence on outside finance is a sign of weakness, because sometimes suppliers may refuse credit beyond certain limits, and the bank may call for a reduction of the overdraft. If this happens, the business may be insolvent in that it does not have sufficient liquid resources (cash) to pay for current operations or to repay current liabilities until customers pay for sales made on credit terms, or unless stock is sold at a loss for immediate cash payment.

16.12 Overcapitalization and Working Capital

Working Capital should be optimum. More investment in working capital than what is needed is even not beneficial moreover it can create adversely affect the business. If there is excessive investment in current assets and in comparison current liabilities are very less than such situation can be denoted as overcapitalization of assets. The inefficiency in managing working capital will cause this excessive working capital resulting in lower return on capital employed and long-term funds will be unnecessarily tied up when they could be invested elsewhere to earn profit. So due to such overcapitalization opportunity cost is also arises.

Thus in short, **Overcapitalization** means Processing more capital than is necessary for the scale of operations being undertaken.

16.13 Under Capitalization

Under capitalization is in fact more harmful than over capitalization. Under capitalization is a situation where the company does not have funds sufficient to run its normal operations smoothly. This may happen due to insufficient working capital or diversion of working capital fund to finance capital items. If the company faces the situation of under capitalisation, it will face difficulties in meeting current obligation, procurement of raw material and stores items, meeting day to day running expenses etc. Its impact will ultimately be the reduced turnover and reduced profitability. The Finance Manager should take immediate and proper steps to overcome the situation of under capitalisation by making arrangement for the sufficient working capital. For this purpose he should prepare the realistic cash flow and funds flow statement of the company. Moreover for the purpose finance manager should renegotiate with the bankers as well as with creditors.

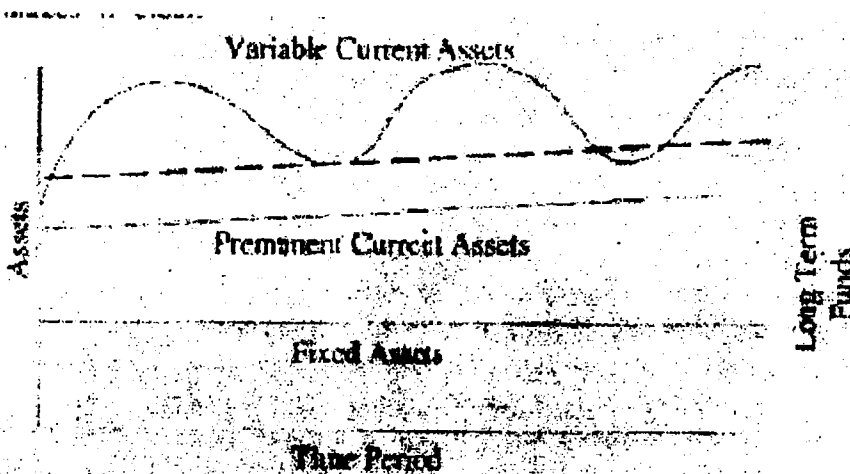
16.14 Strategies in working capital Management

Earlier the banks were the main 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, mainly two strategies are evolved to manage the working capital.

Thus, **Undercapitalization** means Possessing less capital than is necessary for the scale of operations undertaken. undercapitalization often arises when business expand too quickly, making profits but being unable to turn them into cash sufficiently fast to pay debts.

16.14.1 Conservative Working Capital Strategy – Under this strategy high level of current assets are maintained 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. Additionally, 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. But conservative policy will enable the firm to absorb day-to-day business risks. It assures continuous flow of operation 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 to meet the urgent requirements of working capital.

The figure given below shows the conservative approach indicating that for financing fixed assets, permanent current asset and for a part of variable current assets, funds are raised from long-term sources. Only for meeting peak period demand, short-term funds are raised. The element of risk is the minimum in this policy, because the maturity of long-term liability is known much in advance and provision can be made for its repayment. But the policy is expensive and reduces profitability.

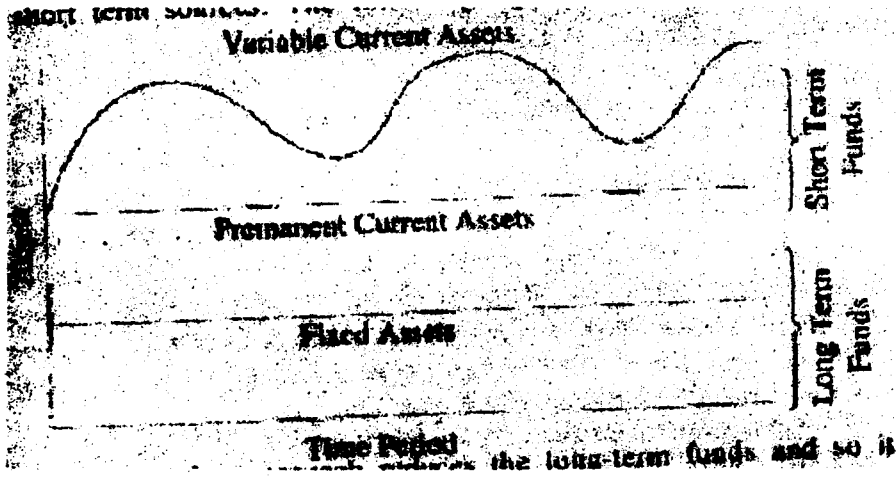


16.14.2 Aggressive Working Capital Strategy – Under this approach current assets are maintained just to meet the current liabilities without keeping any cushion for the variations in working capital needs. The core working capital, which is required on continuous basis, is financed by long-term sources 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 financing working capital. The main drawbacks of this strategy is that it 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. But when aggressive strategy is adopted, some time the firm runs into mismatches and defaults.

It is a cardinal principle of corporate finance that long-term assets should be financed by long-term sources and short-term assets by a mix of long and short-term sources. The above given strategy is explained in the following diagram.



Working capital policies

There are three possible approaches:

	<i>Aggressive</i>	<i>Moderate</i>	<i>Conservative</i>
Cash	Minimum holding	Prepared to hold some precautionary balances	Prepared to hold idle cash balances
Debtors and stock	Minimum consistent with business needs	Moderate levels	High-stock and debtor levels to maximize sales
Creditors	Maximum available without compromising business needs	Moderate level	Low level seeking discounts and reputation for good payment
Future cash flows	Predictable	Reasonably predictable	Unpredictable
Attitude to Risk	Accepting	Neutral	Rejecting

16.14.3 Hedging Approach:

Under this approach, funds for acquiring fixed asset and permanent current assets should be acquired with long-term funds like long-term loan or issue of debentures or equity shares. In other words, it can be said that fixed assets and permanent current assets

should be financed by long-term funds and for temporary working capital short term funds should be used. The following diagram makes it clear.

The above figure shows that for financing fixed assets and permanent current assets, long-term funds are used, while for variable current assets, short-term funds are used, while for variable current assets, short-term funds are utilized as and when necessary. Short term borrowing would be paid off with surplus cash. For expansion and development, when permanent financing is needed, it should be acquired from long-term source only.

16.15 Practical

1. The Board of Directors of Shahin 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.

(Rs. Per unit)

Raw materials	90
Direct Labour	40
Overheads	75
Profit	205
	60
Selling price per unit	265

1. Raw Materials are in stock on average one month
2. Materials are in process, on average 2 weeks
3. Finished goods are in stock, on average one month.
4. Credit allowed by suppliers – one month
5. Time lag in payment from debtors – 2 months
6. Lag in payment of wages – 1 1/2 weeks
7. Lag in payment of overheads – one month

20% of the output is sold against cash. Cash on 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.

Working Notes:

$$1. \quad \text{Raw Material} = 1,56,000/52 \times 4 \text{ weeks} \times \text{Rs. } 90 = \text{Rs. } 10,80,000$$

$$2. \quad \text{Work-in-progress} - 1,56,000/52 \text{ units} \times 2 = 6,000 \text{ units}$$

Rs.

Raw materials (6000 @ Rs. 90)	5,40,000
Wages (6000 @ Rs. 40 x 1/2)	1,20,000
Overheads (6000 @ Rs. 75 x 1/2)	2,25,000
Total	8,85,000

3. Finished goods = $1,56,000/52 \times 4 \times 205$ =Rs. 24,60,000
4. Debtors = $1,56,000/52 \times 8 \times 80/100$ =Rs. 39,36,000
5. Creditors = $1,56,000/52 \times 4 \times 90$ =Rs. 10,80,000

6.	Wages	=1,56,000/52 x 1.5 x 40	=Rs. 1,80,000
7.	Expenses	=1,56,000/52 x 4 x 75	=Rs. 9,00,000

Statement of Working Capital required
Rs.

Current Assets		
Cash in hand and cash in hand		60,000
Stock in hand:		
Raw Material	10,80,000	
Work-in-progress	8,85,000	
Finished goods	24,60,000	44,25,000
Sundry Debtors		39,36,000
		84,21,000
(A)		
Current Liabilities		
Sundry Creditors		10,80,000
Wages Payable		1,80,000
Expenses payable		9,00,000
		21,60,000
(B)		62,61,000
Net Working Capital employed		
(A)-(B)		

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

Particulars	Average period of credit	Estimate for the 1 st year Rs.
Purchase of Material	6 weeks	26,00,000
Wages	1 ½ 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
Sales	cash	2,00,000
Credit Sales	2 months	60,00,000
Average amount of stocks and works-in-progress		4,00,000
Average amount of undrawn profit:		3,00,000

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

Assessment of average amount of Working Capital requirement
(Rs.)

Current Assets	
Stock and work-in-progress	40,000
Debtors (Rs. 60,000 x 2/12)	10,00,000
	14,00,000

(A)	
Current Liabilities	
Lag in payments:	
Purchases	3,00,000
Wages	56,250
Rent	50,000
Salaries	66,666
Other Overheads	1,25,000
	<u>5,97,916</u>
(B)	8,02,084
Total working capital requirement	3,00,000
(A)-(B)	5,02,084
Less: Average amount of undrawn profit	
Net working capital required	

3. A Performa cost sheet of Kalyan Ltd. is given below:

Raw Material		Per Unit Rs.
Direct Labour		80
Overheads		30
		60
	Total Cost	<u>170</u>
Profit		30
	Selling Price	<u>200</u>

The following further particulars are available:

- (1) Raw materials are in stock on average for two month. Materials are in process, on average for half a month. Finished goods are in stock on average for half month.
- (2) Credit allowed by suppliers is two month. Credit allowed to debtors is two months.
- (3) Lag in payment of wages is 1 ½ weeks. Lag in payment of overhead is one month.
- (4) One-fourth of the output is sold against cash. Cash on hand and at bank is expected to be Rs.200000.

You are required to prepare a statement showing the working capital needed to finance a level of activity of 104000 units of production.

You may assume that production is carried on evenly throughout the year, wages and overhead accrue similarly and a time period of 4 weeks is equivalent to a month.

Solution:

- (1) Raw materials remain in stock for one month. If all calculations are made in weeks then production of 52 weeks is 104000 units and so if 1 month = 4

weeks then monthly production would be $14000 \times 4/52 = 8000$ units. It means the working capital required must be equal to raw materials used for 8000 units at Rs.80 per unit.

- (2) Work-in-progress remains in stock for half a month or for 2 weeks. The production for 2 weeks = $104000 \times 2/52 = 4000$ units. The cost of work in progress will be treated as Rs.170 per unit and the working capital required for work in progress will be calculated on that basis.
- (3) Finished goods remain in stock for one month = 4 weeks for which production is of 8000 units. So the working capital equal to the cost of 8000 units will remain invested in finished stock.
- (4) Debtors are given 2 months credit = 8 weeks credit. So the amount which gets invested in debtors is equals to 8 weeks sale. Of course, this sale includes profit and so the actual amount which gets invested in debtors must be calculated on the basis of cost of sales. On that basis the cost should be considered as Rs.170 per unit and sales for 8 weeks would be 16000 units less cash sale of 4000 units = 12000 units only.
- (5) The credit period allowed by suppliers is one month = 4 weeks for which the production is of 8000 units. To that extent the working capital would be reduced.
- (6) Similarly, due to time lag of 1 ½ weeks for wages less working capital would be required. Similar would be the case with payment of overheads (1 month's time lag = 4 weeks for which production is 8000 units).

Statement of Working Capital Requirement

Current Assets:	Rs.
(1) Cash at Bank	200000
(2) Stock	
(i) Raw Materials – 4 week's Requirement i.e. $104000/13 = 8000$ units x Rs.80 per unit	1280000
(ii) Work-in-progress	320000
(a) Material Expenses – half month 4000 units x Rs.80 per unit	
(b) Labour = 4000 units at Rs.30 per unit	120000
(c) Overheads = 4000 units x Rs.60 per unit	240000
(iii) Finished goods: 8000 units x Rs.170 per unit	680000
(3) Sundry Debtors:	Units
Total Sales Units (Two months)	16000
Less : Cash Sales	4000
	12000
Credit sales 12000 units x Rs.170 Cost	2040000
Total Current Assets	4880000
Less: Current Liabilities:	

(1) Sundry creditors for 8000 units x Rs.80 pr unit	Rs. 1280000
(2) Expenses outstanding Wages - 1 ½ weeks production 3000 unit x Rs.30 per unit Overheads One months' production 8000 units x Rs.60 per unit	90000 480000
Total Current Liabilities	1950000
∴ Net working capital required	3030000

4. Padmavati Ltd. operates a normal working day of eight hours. There are 25 working days in a month. Production costs per month are as follows:

	Rs.	Rs.
Raw materials		200000
Direct labour		100000
Overheads:		
Fixed	75000	
Semi-variable	37500	
Variable	37500	150000
Net profit		50000
Sales		500000

Raw materials are in stock on average for	2 month
Materials are in process on average for	½ month
Finished goods are in stock on average	1 month
Credit allowed by creditors is	2 month
Credit allowed to Debtors	1 month
Lag in payment of Wages	1/8 month
Lag in payment of Overheads	2 month

You are asked by the Management to submit statement of working capital required.

Solution:

Statement of Working Capital Requirement

Current Assets :		Rs.
(1) Requirement of Raw material for 2 month		400000
(2) Work-in-progress Total Cost for one month is Rs.450000, So for ½ month		225000
(3) Finished goods for one month Total cost Rs.450000		450000
(4) Investment in debtors on basis of 1 months' cost (450000 x 1)		450000
		1525000
Less: Current Liabilities:		
(1) Creditors for one month's purchase of raw materials	400000	
(2) Wages : Rs.100000 x 1/8 =	12500	
(3) Overheads : Rs.150000 x 1 =	300000	
	712500	
Total requirement of working capital		812500

5. Adinath Ltd. is about to commence a subsidiary business and has provided finance in respect of the acquisition of the necessary fixed assets and you are now required to advise the Directors as to the additional amounts which should be made available for working capital. You are provided with the following estimates of the coming year and you are informed that the overdraft limit of Rs.20000 has been arranged with the company's bankers.

	Average Period of Credit	Estimate for coming year Rs.
Purchase of Materials	12 weeks	260000
Wages	½ weeks	195000
Overheads:		
Rent etc.	6 month	10000
Directors and Manager's Salaries	1 month	36000
Office Salaries	2 weeks	45500
Travelers Commission	3 month	20000
Other Overheads	2 month	60000
Sales :		
Cash	--	14000
Credit	14 weeks	650000
Average amount of stock and Work-in-progress		30000
Average amount of undrawn profits		60000

You are required to prepare from the above figures and information, statements for submission to your Directors giving and estimate of average of working capital which they should provide.

Solution:

Statement of Working Capital Requirement

		Rs.
Current Assets:		
1.	Average amount of stock and W.I.P	30000
2.	Credit Sales : 650000 x 14/52	175000
		205000
Less : Benefit of late payment : (Current Liabilities)		
1.	Materials 260000 x 12/52 = 60000	
2.	Wages 195000 x 1/2 x 1/52 = 1975	
3.	Rent 10000 x 6/12 = 5000	
4.	Directors' Salaries 36000 x 1/12 = 3000	
5.	Office Salaries 45500 x 2/52 = 1750	
6.	Travelers Commission 20000 x 3/12 = 5000	
7.	Other Overheads 60000 x 2/12 = 10000	
Working Capital Requirement		119375
Less : Undrawn Profit		60000

Note:

- (1) As the management has arranged for the bank overdraft of Rs.20000, they will have to make arrangement for further Rs.38375 (58375 – 20000).
- (2) As the rate of gross profit is not given, the investments in debtors have been calculated on the basis of sales.

16.16 Exercise

Answer the following questions:

1. Define working capital? (in terms of gross and net working capital)
2. Explain the objectives for working capital management?
3. What can be the outcomes if sufficient working capital is not maintained in the business?
4. Explain the concept of operating cycle with its usefulness?
5. Explain the various factors that help in determining the quantum of working capital?
6. What special care should be taken while determining the quantum of working capital in case of seasonal business?
7. In what manner inflation affects in determination of working capital?
8. Explain the concepts of overtrading?
9. Explain the concept of 'over capitalization' and 'under capitalization'?
10. Explain various strategies used in working capital management?

16.17 Practical Exercise:

1. You are required to prepare for directors of The Mahavir Ltd. a Statement showing the Working Capital needed to finance a level of activity of 2600 units of output. Your are given the following information for the year 2001.

	Cost per unit (Rs.)
Raw materials	20
Direct Labour	5
Overheads	15
Total Cost	40
Profit	10
Selling Price	50

Raw materials in stocks is kept for one month and materials are in process on average for 1 month.

Debtors are allowed credit of one month. Credit allowed by creditors is two month Lag in payment of wages is 1 weeks. Lag in payment of overhead is half month. Cash on hand and in bank is expected to be Rs.17000.

Finished goods are in stock on average 12 weeks.

You are informed that production is carried on evenly during the year and wages and overheads accrue similarly. For the purpose of calculation it is assumed that a period of four week is equivalent to a month.

2. Shri Krishana Ltd. is desirous to purchase a business and has consulted you and one point on which your are asked to advise them is the average amount of working capital which will be required in the first year's working.

Your are given the following estimates and are instructed to add 12 % to your computed figure to allow for contingencies.

Figures for the year

	Rs.
(i) Average amount locked up for stocks:	
Stock of finished product	8000
Stocks of stores, materials etc.	9000
(ii) Average credit given:	
Inland sales – 6 weeks' credit	324000
Export sales – 1 ½ weeks' credit	72000
(iii) Lag in payment of wages and other outgoing	
Wages 1 weeks	360000
Stocks, materials etc. 1 months	52000
Rent, royalties etc. 12 months	12000
Clerical staff 1 month	62000
Manager : ½ month	4800
Miscellaneous Expenses 1 months	52000
(iv) Payment in advance:	
Sundry expenses (paid quarterly in advance)	19000
(v) Undrawn profits on the average throughout the year	10000

Set up your calculations for the average amount of working capital required.

3. Prepare a statement of Working Capital requirement from the following information for Dev Ltd.:

	Per unit
	Rs.
Raw materials	60
Direct labour	40
Overheads	50
	<hr/>
Total cost	150
Profit	75
	<hr/>
Selling price	<u>225</u>

- (1) Estimated output 169000 units (yearly).
- (2) Raw materials are in stock on an average for one month.
- (3) Materials are in process on an average for one month.
- (4) Finished goods are in stock in an average for two month.

- (5) Credit allowed by suppliers is two month.
- (6) Credit allowed to customers is 1 months.
- (7) Lag in payment of wages is 1 weeks.
- (8) Lag in payment of overhead is two month.
- (9) All sales are on credit.
- (10) Cash in hand and Bank Balance to be kept is Rs.80000.
- (11) Production is carried evenly throughout the year.
- (12) Wages and overheads accrued evenly throughout the year.
- (13) A period of 4 weeks is equivalent to a month.

4 X & Y Ltd is desirous to purchase a business and has consulted you, and one point on which you are asked to advise them, is the average amount of working capital which will be required in the first year's working.

You are given the following estimates and are instructed to add 10 per cent to your computed figure to allow for contingencies.

Amount for the year	
(i) Average amount backed up for stocks:	
Stocks of finished product	Rs 8,000
Stocks of stores and materials	8,000
(ii) Average credit given:	
Inland sales, 6 weeks' credit	3,12,000
Export sales, 1.5 weeks' credit	84,000
(iii) Average time lag in payment of wages and other outgoings:	
Wages, 1.5 weeks	2,60,000
Stocks and materials, 1.5 months	48,000
Rent and royalties, 6 months	10,000
Clerical staff, 0.5 month	62,400
Manager, 0.5 month	4,800
Miscellaneous expenses, 1.5 months	48,000
(iv) Payment in advance:	
Sundry expenses (paid quarterly in advance)	9,000
Undrawn profits on an average throughout the year	11,000

Set up your calculations for the average amount of working capital required.

5. A proforma cost sheet of a company provides the following particulars:

	Amount per unit
Elements of cost:	
Raw materials	Rs 80
Direct labour	30
Overhead	60
Total cost	170
Profit	30
Selling price	200

The following further particulars are available:

Raw materials in stock, on average, one month; Materials in process (completion stage, 50 per cent), on average, half a month; Finished goods in stock, on average, one month.

Credit allowed by suppliers is one month; Credit allowed to debtors is two months; Average time-lag in payment of wages is 2 weeks and one month in overhead expenses; one-fourth of the output is sold against cash; cash in hand and at bank is desired to be maintained at Rs 3,68,000.

You are required to prepare a statement showing "the working capital needed to finance a level of activity of 1,04,000 units of production. You may assume that production is carried on evenly throughout the year, and wages and overheads accrue similarly. For calculation purposes, 4 weeks may be taken as equivalent to a month.

6. While preparing a project report on behalf of a client you have collected the following facts. Estimate the net working capital required for that project. Add 20 per cent to your computed figure to allow contingencies:

	Amount per unit
Estimated cost per unit of production is:	
Raw material	Rs 80
Direct labour	30
Overheads (exclusive of depreciation, Rs 10 per unit)	60
Total cash cost	170

Additional information:

Selling price, Rs 200 per unit

Level of activity, 1,04,000 units of production per annum

Raw materials in stock, average 4 weeks

Work in progress (assume 50 per cent completion stage in respect of conversion costs and 100 per cent completion in respect of materials), average 2 weeks

Finished goods in stock, average 4 weeks

Credit allowed by suppliers, average 4 weeks .

Credit allowed to debtors, average 8 weeks

Lag in payment of wages, average 1.5 weeks

Cash at bank is expected to be, Rs 35,000.

You may assume that production is carried on evenly throughout the year (52 weeks) and wages and overheads accrue similarly. All sales are on credit basis only.

7. A newly formed company has applied for a loan to a commercial bank for financing its working capital requirements. You are requested by the bank to prepare an estimate of the requirements of the working capital for the company. Add 15 per cent to your estimated figure to cover unforeseen contingencies. The information about the projected profit and loss account of this company is as under:

Sales		Rs 21,00,000
Cost of goods sold		<u>15,30,000</u>
Gross profit		<u>5,70,000</u>
Administrative expenses	Rs 1,40,000	
Selling expenses	<u>1,30,000</u>	
		<u>2,70,000</u>
Profit before tax		<u>3,00,000</u>
Provision for tax		<u>1,00,000</u>

Note: Cost of goods sold has been derived as follows:

Materials used	8,40,000
Wages and manufacturing expenses	6,25,000
Depreciation	<u>2,35,000</u>
	<u>17,00,000</u>
Less stock of finished goods (10 per cent not yet sold)	<u>1,70,000</u>
	<u>15,30,000</u>

The figures given above relate only to the goods that have been finished and not to work in progress; goods equal to 15 per cent of the year's production (in terms of physical units) are in progress on an average, requiring full materials but only 40 per cent of other expenses. The company believes in keeping two months consumption of material in stock; Desired cash balance Rs 40,000.

Average time-lag in payment of all expenses is 1 month; suppliers of materials extend 1.5 months credit; sales are 20 per cent cash; rest are at two months credit 78 per cent of the income tax has to be paid in advance in quarterly instalments.

You can make such other assumptions as you deem necessary for estimating working capital requirements.

8. From the following projections of Nariol Ltd for the next year, you are required to determine the working capital required by the company.

Annual sales,	Rs 14,40,000
Cost of production (including depreciation of Rs 1,20,000),	Rs 12,00,000
Raw material purchases.	Rs 7,05,000
Monthly expenditure,	Rs 30,000
Estimated opening stock of raw materials,	Rs 140,000
Estimated closing stock of raw materials,	Rs 1,25,000

Inventory norms:

Raw materials, 2 months

Work-in-process, 1/2 month

Finished goods, 1 month

The firm enjoys a credit of half-a-month on its purchases and allows one month credit on its supplies. On sales orders, the company receives an advance of Rs 15,000.

You may assume that production is carried out evenly throughout the year and minimum cash balance desired to be maintained is Rs 37,000.

9. From the following information, extracted from the books of a manufacturing company, compute the operating cycle in days:

Period covered: 365 days

Average period of credit allowed by suppliers, 16 days

Other data are as follows:

	(Rs)
Average debtors (outstanding)	480
Raw material consumption	4,400
Total production cost	10,000
Total cost of sales	10,500
Sales for the year	16,000
Value of average stock maintained:	
Raw material	320
Work-in-process	350
Finished goods	280

10. You are supplied with the following information in respect of Amar Ltd for the ensuing year: Production of the year, 69,000 units Finished goods in store, 3 months Raw material in store, 2 months' consumption Production process, 1 month Credit allowed by creditors, 2 months Credit given to debtors, 3 months Selling price per unit, Rs 50 " Raw material, 50 per cent of selling price Direct wages, 10 per cent of selling price Manufacturing and administrative overheads, 16 per cent of selling price Selling overheads, 4 per cent of selling price

There is a regular production and sales cycle and wages overheads accrue evenly. Wages are paid in the next month of accrual. Material is introduced in the beginning of the production cycle. You are required to ascertain its working capital requirement.

11. Sun Ltd sells goods at a gross profit of 22 per cent. It includes depreciation as a part of cost of production. The following figures for the 12 months period ending March 31, current year are given to enable you to ascertain the requirements of working capital of the company on a cash cost basis. In your working, you are required to assume that:

- (i) A safety margin of 15 per cent will be maintained;
- (ii) Cash is to be held to the extent of 50 per cent of current liabilities;
- (iii) There will be no work-in-progress;
- (iv) Tax is to be ignored;
- (v) Finished goods are to be valued at manufacturing costs. Stocks of raw materials and finished goods are kept at one month required

Sales at 2 month's credit, Rs 27,00,000

Materials Consumed (suppliers' credit is for 2 months), Rs 6,75,000

Wages (paid on the last day of the month) 5,40,000

Manufacturing expenses outstanding at the end of the year (cash expenses are paid one month in arrear), Rs 60,000

Total administrative expenses (paid as above) Rs 190,000

Sales promotion expenses (paid quarterly in advance), Rs 90,000

12. Sumi Company has the following selected assets and liabilities:

Cash	Rs 45,000
Retained earnings	1,60,000
Equity share capital	1,50,000
Debtors	60,000
Inventory	1,11,000
Debentures	1,00,000
Provision for taxation	57,000
Expenses outstanding	21,000
Land and buildings	3,10,000
Goodwill	50,000
Furniture	28,000
Creditor	39,000

You are Required to determine (a) Gross working capital and (b) Net working capital.

13. The management of Genius Ltd has called for a statement showing the working capital needed to finance a level of activity of 3,00,000 units of output for the year. The cost structure for the company's product, for the above mentioned activity level, is detailed below:

	Cost per unit
Raw materials	Rs 20
Direct labour	5
Overheads	15
Total cost	40
Profit	10
Selling price	50

Past trends indicate that raw materials are held in stock, on an average, for two months.

Work-in-progress will approximate to half-a-month's production.

Finished goods remain in warehouse, on an average, for a month.

Suppliers of materials extend a month's credit Two month's credit is normally allowed to debtors. A minimum cash balance of Rs 25,000 is expected to be maintained.

The production pattern is assumed to be even during the year.

Prepare the statement of working capital determination.

14. A client yours, Care Ltd, is about to commence a new business, and finance has been provided in respect of fixed assets. They have, however, asked you to advise the additional amount which they should make available for working capital.

They provide you with the following estimates for their first year and inform you that they have arranged on overdraft limit with "their banker of Rs 1,80,000.

	Average period of credit	Estimate for the first year
Purchase of materials	6 weeks	Rs- 26,00,000
Wages	1.5 weeks	19,50,000
Overheads		
Rent etc	6 months -	1,00,000
Director and managers salaries	1 month	3,60,000
Travel and office salaries	2 weeks	4,55,000
Travelers' commission	3 months	2,00,000
Other overheads	2 months	6,00,000
Sales-cash		1,40,000
-credit	7 weeks	65,00,000
Average amount of stocks and work-in-progress	—	3,00,000
Average amount of undrawn profits		3,10,000

Sales were made at an even rate for the year.

You are required to prepare from the above figures and information table for submission to your clients, giving an estimate of the average amount of working capital which they should provide. State your assumptions, if any, clearly.

15. Hiten Ltd plans to sell 30,000 units next year. The expected per unit cost of goods is as follows:

Raw material	Rs 100
Manufacturing expenses	30
Selling, administrative and financial expenses	20
Selling price	200

The duration at various stages of the operating cycle is expected to be as follows: Raw material stage, 2 months Work-in-process stage, 1 month Finished goods stage, 1/2 month Debtors stage, 1 month

Assume the monthly sales level of 2,500 units. Calculate the investment in various current assets and estimate the gross working capital requirement. The desired cash balance is 5 per cent of the gross working capital requirements.

16. Determine the working capital requirements from the following particulars:

Annual budget for:	Amount (Rs lakhs)
Raw materials	360
Supplies and components	120
Manpower	240
Factory expenses	60
Administration	90
Sales	1,100

You are given the following additional information:

- (i) Stock-levels planned: Raw materials, 30 days, supplies and components, 90 days.
- (ii) 50 per cent of the sales is for cash; for the remaining 22 days credit is normal.
- (iii) Finished goods are held in stock for a period of 7 days before they are released for sale.
- (iv) Goods remain in process for 6 days,
- (v) The company enjoys 30 days credit facilities on 20 per cent of the purchases.
- (vi) Cash/bank balances had been planned to be kept at the rate of half month's budgeted expenses. You may make assumptions as considered necessary and relevant in this connection.

17. Samir Ltd sells goods in domestic market on a gross profit of 25 per cent, not counting depreciation as a part of the 'cost of goods sold'. Its estimates for next year are as follows:

Sales — Home at one month's credit	1,200
Exports at 3 months' credit, selling price 10 per cent below home price	540
Materials used (suppliers extend 2 months' credit)	450
Wages paid, 1/2 month in arrears	360
Manufacturing expenses (cash) paid, one month's arrears	540
Depreciation on fixed assets	60
Administrative expenses, paid one month in arrears	120
Sales promotion expenses (payable quarterly — in advance)	60
Income — tax payable in 4 instalments of which one falls in the next financial year	150

The company keeps one month's stock of each of raw materials and finished goods and believes in keeping Rs 20 lakh as cash.

Assuming a 15 per cent safety margin, ascertain the estimated working capital requirements of the company (Ignore work-in-process).

Unit: 17 : Management of Receivables

Introduction

When a firm sells goods for cash, payments are received immediately and therefore no receivables are created. However, when a firm sells goods or services on credit, payments are received only at a future date and receivables are created. It is an essential marketing tool in modern business trade. Credit sales creates receivables which the firm is expected to collect in near future. A firm grant credit to its customers so that its sales are not lost to competitors. A typical manufacturing company has a receivables to total asset ratio in the region of 20% to 25%. This represents a considerable investment of funds and so the management of this asset can have a significant effect on the profit performance of the company.

An account receivable is generated when an enterprise, having granted credit, accepts, in lieu of cash, a written or implied promise to pay in the future for delivery of its goods or services. In today's business environment, competitive pressures, customer preferences, and promotional selling opportunities lead the management of most enterprises to offer credit.

Accounts receivable often constitute a significant portion of assets and are, therefore, a major business investment. Successful control of the accounts receivable process demands development of appropriate credit, collection, and financing policies compatible with the enterprises profit, liquidity, and market share.

Accounts receivable policy development is subject to internal and external business constraints and requires careful evaluation of the policy's potential impact on sales volume; cash management objectives and procedures; direct and indirect costs of receivables management; and customer relations.

Once an accounts receivable policy is implemented, it should be reassessed at least annually, since policy changes could be required to adjust for changing internal and external conditions, such as changing business objectives, varying competitive industry standards, fluctuating interest and foreign exchange rates, inflation, rapidly increasing credit volume, technological advances, and global trade pattern trends.

This guideline highlights the generally accepted industry principles and processes used to achieve effective management of an enterprises accounts receivable. It also addresses important issues arising from receivables transactions. Emphasis is placed on the development of appropriate credit, collection, and financing policies, and the evaluation and control techniques needed to ensure effective management of the accounts receivable process. The guideline provides prescriptive recommendations to assist managers to make rational decisions and choose effective implementation techniques. It does not include examples of accounting transactions.

Receivables balance as shown in the Balance sheet of a company related to sales made on credit for which payment has not yet received. They arise from the sale of goods and services on credit basis. Sales on credit depends upon the nature of business. To increase the sale volume, generally the credit facility will be offered to the customers

which result in investment in receivables to maximize return on capital employed. The balance in receivables account is determined by the number of customers, length of credit, amount of credit allowed to each customer etc.

To achieve growth in sales and to meet competition in the industry a firm may resort to credit sales. A retail trader will do his business mainly on cash basis whereas a manufacturing concern will have heavy balance in receivables. Firms offer credit to customers to attract more business, and the increased turnover will result in increased profit to the firm. Though it has become normal to give credit to the customers but it is the market in which the firm is doing business is the ultimate determinant in credit sales and receivables balance.

Structure of the Chapter:

- 17.1 Objectives:
- 17.2 Definition:
- 17.3 Cost of Extending Credit
- 17.4 Cost – Benefit Analysis of Credit Sales
- 17.5 Cash Discount
- 17.6 Credit Rating of Customer
- 17.7 Credit Policy
- 17.8 Age wise Analysis of Receivables
- 17.9 ABC Analysis of Receivables
- 17.10 Factoring of Book Debts
- 17.11 Exercise
- 17.12 Practical
- 17.13 Practical Exercise

17.1 Objectives:

At the end of the chapter the student will learn about –

- What is receivables
- Cost associated with receivable management
- Techniques of receivable management
- Factoring

17.2 Definition:

According to Hampton 'receivables are asset accounts representing amounts owned to the firm as a result of the sale of goods/services in the ordinary course of business.

17.3 Cost of Extending Credit

Every time Company extend credit or terms to a Debtor, Company become the Debtors Financer. In effect, Company loan the Debtor money for 30 days, or more, Interest Free, and Company lose the use of that money while Company are waiting to be paid.

Extending Credit impacts the company in three major ways:

- Company lose interest that Company could have earned, even if Company put it into a low interest savings account.
- Company can't take advantage of purchase discounts from the vendors if the funds are not available.

- Company may lack the capital to produce the next job, and may be forced to decline profitable deals from good payers.

The longer Company's Debtor takes to pay, the greater the impact upon company.

The costs involved in extension of credit to the customers are as follows:

- **Carrying Cost:** This cost includes the interest on capital blocked in the receivables balances, the administration costs associated with the credit decision making and controlling of debtors balances, cost of keeping the records of credit sales and payments cost of collection of payments from customers, opportunity cost of capital that can be employed elsewhere than in receivables balances.
- **Default Risk:** There are also costs associated with the risk of default – a certain portion of receivables will never pay, and will become 'bad debts' which has to be written off of against the profits of the firm.

Administration costs of receivables Management

The costs relating to the administration of receivables is as follows:

- Use of office space, processing equipment and remuneration of sales force involved in debtors collection etc.
- Chasing up slow paying debtors.
- Recording receipt of cash and processing on individual customer records.
- Expenditure incurred for credit control checks.
- Cost incurred for sending invoices and statement of accounts to individual customers.
- Accounting, recording and processing of debtors balances.
- Costs incurred for classification of payables.
- Screening the potential customers for granting credit.

17.4 Cost – Benefit Analysis of Credit Sales

When the sales on credit terms are extended to the customers, the firm will consider the level of default risk attached to it. With every sale there is some risk that the customers will not be able to pay, but with large companies the risk is minimal and with small and illiquid companies the risk of non-payment might be high. Moreover, cost of administering such receivables will also increase. But by giving credit to the customers the quantum of sales will be increased which will increase the profits of the business. If the benefits due to credit sale are more than the cost associated with it then the firm should go for increased credit sales and vice versa.

17.5 Cash Discount and Sales Volume

Cash discount policies may be established for a number of reasons to conform to the company's overall financial strategy. It is expected that a firm should be an effective manager of its receivables if the discount rate is higher than the cost of capital, and the cost of capital is higher than that

at which the customer is able to borrow. Consideration should be given to the implications of customers taking a discount to which they are not entitled.

A surcharge, or late payment charge, can be used to encourage prompt payment and to equalize treatment for customers who pay on time versus those who delay payment.

17.6 Credit Rating of Customer

For credit rating the customer the following information will be collected and processed, depending upon which the individual credit limits and the terms will be fixed to each individual customer.

- Statistical data available with credit rating agencies.
- Company's own experience
- Bank checking
- Financial statements of the customer
- The experience of sales force

The Credit Manager should thoroughly check the following five 'Cs' - Character, capacity, capital, collateral and condition.

Character	-	Relates to the customer's willingness to pay.
Capacity	-	The customer should have ability to pay his dues.
Capital	-	The customer should have sufficient funds to pay the dues.
Collateral	-	The security available with the customer in paying the debt.
Condition	-	The economic position of the customer.

17.7 Credit Policy

An enterprises credit policy is a major, controllable element that has a significant influence on sales demand and profits. The many factors that comprise credit policy should be analyzed before the decision is made whether or not to offer credit or to make changes to current policy. Factors that could constrain or influence credit policy include: Ability to finance the credit policy. Costs of financing receivables by means of internal or external credit facilities should be estimated to determine which approach is feasible for the enterprise;

Industry credit terms. Terms tend to be alike throughout an industry. However, if an enterprise has a superior product or service, it could consider applying more restrictive credit terms than those offered by the industry in general;

Competitive issues. The initial credit policy and any subsequent changes made to it are often limited by competitor and customer reactions to competitive credit benefits, to payment convenience, and to pricing discount and financing efficiency;

The size of the customer base and relative risk profile of major customers. Credit policy should take into account major, high-risk customers and the weighting that should be given to them in relation to the total customer base;

Sales volume. If a new or changing credit policy is expected to increase sales volume, the ability to meet customer demand should be considered;

Late payments and defaults. As a firm's credit policy is eased, late-payment and default risk usually increase;

Promotional activities. The implementation of a promotional program may require a target market base, which is provided by records of credit customers; and **Sovereign risk and credit policy on export sales.** Export sales credit policy should consider political, economic, and local practices as well as specific banking requirements.

The development of the enterprise's credit policy requires that specific decisions be made regarding several variables that establish the terms of sale and the acceptable level of credit risk. The variables are:

- credit period;
- credit quality standards;
- credit terms;
- cash discounts and surcharges;
- credit limits;
- credit instruments
- payment methods.

When implementing or varying the credit policy by changing any one, or all, of the above variables, management must assess the impact on net income, calculate the probability of achieving the planned results, and determine the additional level of risk assumed. In particular, any relaxation of credit policy should be considered only after very careful evaluation of the impact of the change by top management, because it is extremely difficult to revert to more stringent policies without experiencing adverse effects on customer relations and sales.

Process of Receivables Management

The following process will help in efficient management of the receivables:

- Develop the reports for internal appraisal of the customer.
- Review the customer credit if required.
- Establish the initial creditworthiness.
- Close monitoring of the credit terms and customer compliance.
- Check the credit before the dispatch of consignment.
- Frame the credit terms for the customers if credit is sanctioned.
- Take the opinion of the sales force and internal staff.

Optimum Size of Accounts Receivables

A firm should strike a balance of accounts receivables. A liberal credit policy increase the sales as well as the profitability of the firm. But simultaneously it should consider the costs involved in liberal credit policy which leads to the increased investment in receivables balances, risk of bad debts, costs of administration of receivables, the problems of liquidity, etc. Hence, a firm should adopt the policy on accounts receivable to minimize the costs and risk; and maximize the firm's profitability and return. So the credit policy should be decided after considering all the benefits and cost associated with such credit policy.

17.8 Age wise Analysis of Receivables

For better control on collection of receivables, a statement analyzing the period of overdue and the amount involved has to be prepared in the following lines illustrated below:

No. of days Outstanding	Amount RS.	% to total Debtors	Number of accounts	% of total accounts
Less than 30	36,00,000	60	750	62.5
31 - 60	9,00,000	15	240	20.0
61 - 90	7,60,000	12.7	110	9.17
91 - 120	4,40,000	7.3	60	5.00
121 and above	3,00,000	5	20	3.33
Total	60,00,000	100	1200	100

17.9 ABC Analysis of Receivables

The ABC analysis technique mainly framed for effective control of inventory. The application of the same technique to manage the debtors will also give good results for the firm with huge number of accounts. Here, in this method the balances of debtors will be distributed in three categories namely A, B and C according to amount involved in receivable. The application of the technique is explained with the help of the following table:

Category of Debtors	% of accounts to total accounts	% of balance outstanding to total debtors balance
A	20	70
B	30	20
C	50	10
TOTAL	100	100

It is seen from the above table that only 20 per cent of the total accounts represents the 70 per cent of total debtors balance and a close scrutiny of these account and realization of dues in time will cost only moderately and improves the efficiency of debtors collection and also improve the liquidity of the firm and avoids unnecessary

blockage of funds in debtors' balances which can be invested elsewhere to obtain the opportunity cost of funds. To a large extent it avoids the administration costs also.

Category B debtors' balance needs moderate control and Category C balance, though large in number, but are very less in amount to the proportion of total debtors and the managerial attention should not be diverted to these balances. However, it also requires moderate attention for efficient management of Debtors.

17.10 Factoring of Book Debts

Some times a business firm may seek the financial service called 'factoring' to finance on its debtors' balances. This involves selling of book debts to an organisation, which will purchase the book debts at less than their face value and will collect the balances from the debtors on due dates. Factor may be defined as a contract by which the factor is may provide following services, i.e. finance, the maintenance of accounts, the collection of receivables and protection against credit risks. The supplier is to assign to the factor on a continuing basis, by way of sale or security, receivables arising from the sale of goods or supply of services. And on the other hand, the factor will collect receivable on behalf of client.

Broadly speaking factors perform following functions:

- Providing finance against bills receivables and trade debts.
- Undertaking sales ledger administration responsibilities of the client including maintenance of books, accounting, asset management, collection of debts and furnishing information reports to the client.
- providing debt insurance facility to the client against possible losses arising insolvency/bankruptcy of debtors and,
- Offering relevant consultancy services in the areas of finance, marketing etc.

Essentials of Factoring:

- Collection of receivables and protection against default in payment by debtors is managed by the factors.
- The factor is financing the client by giving advance. He fulfils the need for working capital. It is less costly.
- The client is relieved of difficulty in collecting moneys from the debtors. Thereby he is free from such burden.
- The factors take all possible risks in management of debtors.
- Moreover, the factor is providing services of maintaining accounts in clear manner which is useful in finalizing accounts of the company.

Cost-Benefit analysis of factoring:

There are mainly two costs are involved in factoring:

1. Factoring commission
2. Interest on advance granted by factor.

The benefits of factoring are:

1. It provides specialized service in credit management.
2. It saves the cost of administration due to the scale of economies and specialization.

A firm has to evaluate costs and benefits to arrive at a decision regarding the use of factoring services with the aid of numerical computation.

17.11 Exercise

Answer the following questions:

1. Define 'Receivables'? what are the various costs associated with extending credit to customers?
2. Need for receivable management?
3. Write a note on determining the credit policy?
4. Explain the concept of age wise analysis of receivable management?
5. Explain the ABC analysis for inventory management?
6. Write a note on 'factoring' in receivable management?
7. Define 'Receivables'? what are the various costs associated with extending credit to customers?
8. Need for receivable management?
9. Write a note on determining the credit policy?
10. Explain the concept of age wise analysis of receivable management?
11. Explain the ABC analysis for inventory management?
12. Write a note on 'factoring' in receivable management?

16.12 Practical

1. Bhavin Ltd. is selling a product at Rs. 16 per unit. The data regarding its sales, cost etc. are given below:

Sales	20000 units
Variable cost per unit	Rs. 10
Average cost per unit	Rs. 13
Total fixed cost	Rs. 100000
Average collection period	40 days

The company is contemplating relaxation of its credit policy which is expected to result in 20 percent increase in unit sales, and the average collection period would increase to 60 days. There would be no change in bad debts. There would be negligible increase in collection expenses.

If the required return on investments of the company is 19 percent, should the company relax its credit policy?

Solution:

For answering this question, two things are to be compared:

- (1) Increase in profit due to increase in sales.
- (2) Cost of marginal (additional) investment in accounts receivable (debtors).

If additional profit is in excess of the cost, the credit policy should be relaxed and if the cost is in excess of additional profit, the policy should not be relaxed.

(A) Increase in Profit due to Increase in Sales:

The fixed costs are fully recovered at the current level of sales and so the contribution of additional units sold would be the profit.

Contribution per unit	=	S. P. Rs. 16 – Rs. 10 Variable Cost
	=	Rs. 6
Additional Sales	=	20000 unit x 20 %
	=	4000 units
Profit on additional sales	=	4000 units x Rs. 6
	=	Rs. 24000

(B) Additional Investments in Accounts Receivable:

$$\text{Marginal Investment} = \frac{\text{Total Cost of Sales}}{\text{Debtors Turnover}}$$

$$\text{Now Debtors Turnover (current)} = \frac{360 \text{ days}}{40} = 9$$

$$\text{Proposed} = \frac{360 \text{ days}}{60} = 6$$

$$\begin{aligned} \text{Average Investment (current)} &= \frac{20000 \text{ units} \times \text{Rs.} 13}{9} \\ &= \frac{260000}{9} = \text{Rs.} 28888 \end{aligned}$$

$$\text{Average Investment (proposed)} = \frac{(20000 \times \text{Rs.} 13) + (4000 \times 10)}{6}$$

$$\frac{260000 + 40000}{6}$$

$$\frac{300000}{6} = \text{Rs.}50000$$

Additional Investment = Rs.50000 – Rs.28888
= Rs.21112

(C) Return on Additional Investment = Rs.21112 x 19%
= Rs.3800

This is an opportunity cost. If these funds were invested outside it would have earned an income of Rs.3800 at 19 percent.

(D) Comparison of Additional Profit and Additional Costs:

Additional Profit	Rs.21112
Less: Additional Costs	Rs. 3800
	Rs.17312

The calculations show that by relaxing credit policy, there would be an additional profit of Rs.17312. Hence the credit policy should be relaxed.

The details of Jay Ltd. are as follows:

Sales	:	20000 units
Selling price per unit	:	Rs. 19
Variable cost per unit	:	Rs. 13
Average cost per unit	:	Rs. 16
Average collection period	:	40 days

2.Moon Ltd. is contemplating to allow 4 % cash discount for payment prior to the 15th day after a credit purchase by a customer. It is expected that due to this policy the sales would increase by 20 percent. Assume that bad debts will not be affected. The collection period will decline to 20 days. The estimate 50% of the total sales would be on discount. Should the proposed plan be implemented if expected rate of return is 15%?

Solution:

The answer depends upon two factors:

- (1) Increase in Profit. It will increase (i) due to increase in sales and (ii) Due to reduced investment in account receivable as the collection period will decrease.
- (2) Expense means the amount of cash discount on collection of debtors.

(A) Profit on increased Sales :

Sale of additional units x Contribution per unit
= 4000 units x Rs. 5 (Additional Sale = 20000 units x 20 %)
= Rs. 20000

(B) Saving due to reduced collection period:

	Cost of sales
Average Investment in Account Rec.	= $\frac{\text{-----}}{\text{Receivable Turnover}}$
	$\frac{20000 \times \text{Rs.} 16}{360 / 40} = \frac{320000}{9}$
Average Investment in A.R. (present)	= $\frac{\text{-----}}{\text{-----}}$
	$\frac{(20000 \times 16) + (4000 \times 13)}{360 / 20}$
Average Investment (in proposed plan)	= $\frac{\text{-----}}{\text{-----}}$
	$\frac{280000}{19}$
	= Rs. 20666
Decrease in Average Investment	= 35555 - 20666 = Rs. 14889
The expected rate of return	= 15 %
∴ Return = 14889 x 15 %	= Rs. 2233
Total Benefit = Rs. 20000 profit + Rs 2233 savings in Av. Inv.	= Rs. 22233

(C) Cost involved in cash discount:

Total Sales = 20000 + 40000 = 24000 units
Total Sales Value = 24000 x Rs. 19
= Rs. 432000
Cash discount will be allowed on 50 % of 432000
Rs. 216000 x 4 % discount = Rs.8640

(3) Comparison o' Additional Profit and Cost:

Additional Profit	Rs. 22233
Additional Cost	Rs. 5640
Net Extra Profit	Rs.13593

Thus this proposal should be implemented, as it will insurance the profit by Rs. 13593.

3. Prakash Ltd. contemplating to increase the credit period from 45 days to 72 days. At present, the average collection period is 60 days, which is expected to increase to 90 days. It is also expected that bad debts will increase from the current level of 3 % to 5 % of sales. The credit sale which is at present 19000 units is expected to increase to 21000 units. The average cost per unit is Rs.16 the selling price is Rs.21 and variable cost per unit is 13. The expected rate of return of the firm is 22 %.

State whether the firm should extent the credit policy.

Solution:

(A) Additional Profit on Increase Sales:

$$\begin{aligned} \text{Additional Sale} &= 21000 - 19000 \text{ units} \\ &= 3000 \text{ units} \times \text{Rs.8 contribution} \\ &= \text{Rs. 24000} \end{aligned}$$

Here it is assumed that total fixed costs are recovered from present sales. So for additional sales, the contribution per unit is the profit.

(B) Cost of additional investment in Receivables:

$$\begin{aligned} \text{Average Investment (present)} &= \frac{\text{Cost of Sales}}{\text{Receivable Turnover}} \\ &= \frac{19000 \times \text{Rs. 16}}{360 / 60} \\ &= \frac{288000}{6} \\ &= \text{Rs. 48000} \\ \text{Average Investment (proposed)} &= \frac{(19000 \times \text{Rs.16}) + (3000 \times \text{Rs.13})}{360 / 90} \\ &= \frac{288000 + 39000}{4} = \frac{327000}{4} \\ &= \text{Rs.81750} \end{aligned}$$

Additional Investment	= Rs.81750 – Rs.48000
	= Rs.33750
Return on Additional Inv.	= Rs.31500 x 22 %
	= Rs.7425

(C) Additional Bad Debts:

Present Bad Debts	= (19000 units x Rs.21) x 3%
	= Rs.378000 x 3 %
	= Rs.11340
Bad debts for proposed scheme	= (21000 x Rs.21) x 5 %
	= 441000 x 5 %
	= Rs.22050
	= Rs.22050 – Rs.11340
	= Rs.10710
Total Cost	= Rs.7425 + Rs.10710
	= Rs.19135

(D) Comparison of Additional Profit & Costs:

Additional Profit	Rs.24000
Additional Expenses	Rs.19135
Net Extra Profit	Rs. 5865

The credit period should be extended, as it will result in extra profit of Rs.5865.

4. Saurin Ltd. is considering to make its collection policy stricter. The information is as follows:

The company is selling 15000 units at present at Rs.45 per unit. Its variable cost per unit is Rs.30 and average cost per unit is Rs.35. the average collection period is 60 days, collection expenditure is Rs.8500 and bad debts expenses are 6 %.

If the collection policy is made stricter, the additional collection charges of Rs.13000 will be incurred and bad debts expenses will be reduced to only 3 % the average collection period will decline to 36 day. Due to rigorous collection procedure, the sales are expected to decline by 300 units.

If the required rate of return of the firm is 19 % , what advice would you give to the firm?

Solution:

Here, in order to decide whether the stricter credit policy should be accepted, two items must be compared : one, the additional benefit and two incremental expenses

The benefits of the policy are (1) bad debts expenses would be reduced. Average net profit will be reduced.

There will be additional costs : (1) sales would decrease (2) collection charges would increase.

(A) Decrease in Bad Debts:

<i>Bad debts at present</i>	$= 15000 \times 45 = \text{Rs.}675000 \times 6\%$	$= \text{Rs.}40500$
Bad debts (proposed)	$= 14700 \times 45 = \text{Rs.}661500 \times 3\%$	$= \text{Rs.}19845$
	Decrease in Bad debts	Rs.20655

(B) Reduction in Average Investment:

Present Investment	$= \frac{15000 \times \text{Rs.}35}{360 / 60} = \frac{525000}{6}$	$= \text{Rs.}87500$
Proposed Investment	$= \frac{(15000 \times \text{Rs.}35) - (300 \times 30)}{360 / 36} = \frac{516000}{10}$	$= \text{Rs.}51600$
	Reduction in Investment	$= \text{Rs.}35900$

Return on reduced investment	$= 35900 \times 19\%$	$= \text{Rs.}6462$
Total Benefit	$= \text{Rs.}20655 + \text{Rs.}6462$	$= \text{Rs.}27117$

(C) Reduction in Sales: $= 300 \text{ units} \times \text{Rs.}15 \text{ contribution}$
 $= 4500 \text{ profit will be reduced}$

(D) Increase in collection charges $= \text{Rs.}13000$
Total Expenses $= 4500 + 13000 = \text{Rs.}17500$
Savings $= \text{Rs.}27117 - \text{Rs.}17500$
 $= \text{Rs.}9617$

Thus, there will be as savings of Rs.9617 due to stricter collection policy and so it should be adopted.

5. Star Ltd. currently selling on a credit term of 45 days credit. The directors of the company are considering to change it to "2/10 Net 60" credit terms to increase its sales. The following estimates are made in respect of the proposed change.

Current sales	Rs.1600000
Estimated increase in sales	Rs. 400000
	Rs.2000000
Estimated total sales that will avail discount offer	Rs.900000
Estimated increased investment in receivables	Rs.160000
Estimated increased costs:	
Bad debts losses	: 1.6 % of increased sales
Production and selling cost	: 65 % of increased sales
Administration costs	: 5 % of increased sales

Opportunity costs	: 13 % of increased investment receivables
Cash discount	: 3 % on estimated total sales that will avail Discount

State whether it is desirable to introduce the above changes.

Solution:

Let us calculate opportunity cost.

Suppose credit sale is Rs.100, the receivable will increase by Rs.100.

But the funds invested in this sales is equal to its cost.

Here total cost = Production and selling costs + Adm. Costs
 = 65 % + 6 % = 70 %

The increase in receivable = 160000 x 70 %
 = Rs.112000

Return at 12 % on this additional investment = 112000 x 13 %
 = Rs.14560

Calculated of cost-benefit due to liberalization:

Additional sales			Rs.400000
Less: Production and selling cost 65%	260000		
Administrative costs 5%	20000		
			Rs.280000
	Gross Profit	Rs.120000	
Less: Costs of receivables: Rs.			
Bad debts	6400		
Opportunity costs	14560		
Cash discount			
3 % of Rs.900000	27000		Rs. 47960
	Additional to Profit		Rs. 72040

Thus the profit will increase by Rs.72040 due to liberal credit policy.

17.13 Practical Exercise

1. Power Ltd. is contemplating an increase in the credit period from 40 days to 60 days. The average collection period which is at present 45 days is expected to increase to 72 days. It is estimated that the bad debts will be increased to 4% in comparison of 2% at present. Due to increase in credit period, credit sales are expected to increase from the present level of 10000 units to 12000 units. The present average cost per unit is Rs.40, sales per unit is Rs.50 and variable cost is Rs.32 per unit. The firm expects a rate of return of 14%.

On the basis of the above information, state whether the firm should extend the credit period?

2. Libra Ltd. is currently selling 50000 units at Rs.20 on credit. The variable cost per unit Rs.12 and average cost is Rs.15 per unit. The collection expenses are Rs.10000 and bad debts are 3 per cent of sales.

The company wants to make its credit policy strict. With additional collection charges of Rs.15000, it is expected that the bad debts will be only 1.5% and the average collection period will decline to 30 days from current credit period of 45 days. Due to rigorous collection, the sales are expected to decline by 1000 units. If the required rate of return is 19%, what advice would you give to the firm?

3. Suppose, a firm is contemplating an increase in the credit period from 30 to 60 days. The average collection period which is at present 45 days is expected to increase to 75 days. It is also likely that the bad debt expenses will increase from the current level of 1 per cent to 3 per cent of sales. Total credit sales are expected to increase from the level of 30,000 units to 35,500 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 return of 16 per cent.

Should the firm extend the credit period?

4. S Ltd has at present annual sales level of Rs 10,000 units at Rs 300 per unit. The variable cost is Rs 200 per unit and fixed cost amount to Rs 3,10,000 per annum. The present credit period allowed by the company is 1 month. The company is considering a proposal to increase the credit period to 2 months and 3 months and has made the following estimates:

	Existing		Proposed	
Credit period (month)	1		2	3
Increase in sales (per cent)	—		15	30
Bad debts (per cent)	1		3	5

There will be increase in fixed cost by Rs 50,000 on account of increase in sales beyond 25 per cent of present level. The company plans a pre-tax return of 20 per cent on investment in receivables.

You are required to calculate the most paying credit policy for the company.

5. Sumeet company currently makes all sales on credit and offers no cash discount. It is considering a 2 per cent cash discount for payment within 10 days. The firm's current average collection period is 60 days, sales are 2,10,000 units, selling price is Rs 30 per unit, variable cost per unit is Rs 20 and average cost per unit is Rs 25 at the current sales volume.

It is expected that the change in credit terms will result in increase in sales to 2,25,000 units and the average collection period will fall to 45 days. However, due to increased sales, increased working capital required will be Rs 1,00,000 (it does not take into account the effect on debtors). Assuming that 50 per cent of the total sales will be on cash discount and 20 per cent is the required return on investment. should the proposed discount be offered?

6. A firm is considering an increase in its credit period from 30 to 60 days. It currently sells 3,10,000 units for Rs 3 each. The average age of receivables is 40 days; bad debts are 0.5 per cent; the variables cost per unit is Rs 2.30 and the average cost per

unit is Rs 2.60. The change in the credit period is expected to increase sales to 3,40,000 units; bad debts will increase to 3 per cent and the average collection period to 72 days. Assume the required return on investments is 19 per cent. Should the firm carry out the proposal?

7. A firm is considering whether collection policies should be made more strict. At present, it is selling 1,45,000 units at Rs 32 per unit. Bad debts expenses are 3 per cent, collection expenditure is Rs 40,000; the average collection period is 58 days; the variable and average per unit costs are Rs 25 and Rs 29 respectively.

With additional collection charges of Rs 30,000, it is expected that the bad debt expenses will be only 2 per cent and the average collection period will decline to 40 days. Due to the rigorous collection procedure, the sales are expected to decline by 2,000 units. If the required rate of return is 20 per cent, what advise would you give to the firm?

8. The History Ltd. has currently annual credit sales of Rs 7,90,000. Its average age of accounts receivable is 60 days. It is contemplating a change in its credit policy that is expected to increase sales to Rs 10,00,000 and increase the average age of accounts receivables to 72 days.

The sale price is Rs 25 per unit, the variable cost per unit is Rs 12 and the average cost per unit at Rs 7,80,000 sales volume is Rs 17. Assume a 360 day year.

- (a) What is the average accounts receivable with both the present and the proposed plans?
- (b) What is the average cost per unit with the proposed plan?
- (c) Calculate the marginal investments in accounts receivable resulting from the proposed change.
- (d) What is the cost of marginal investment if the assumed rate of return is 15 per cent?

Unit :19 : Management of Inventory

Introduction

Management of inventory is a branch of management of working capital as in a manufacturing unit usually about 20 to 30% of the total assets are in the form of inventory and any efforts in stock control will bring ultimate benefits for the enterprise. An efficient management of inventory is an essential requirement for the success of the enterprise. The ultimate objective of inventory management may be considered as maintaining optimum level of inventory and overall reduction in inventory ordering and carrying cost. It is necessary to carefully decide how much goods produced or purchased should be kept in stock, because storing each unit of inventory has advantage and disadvantages both from the view point of cost. If inventory is too large, for instance, production is continuous and customers demand can be easily met. But too large an inventory means that huge capital is locked up and cost of storage is also excessive. The management has to compare it in money terms the advantages of large inventory against its disadvantages. Then and then only, the management can arrive at an ideal quantity of inventory. This is the essence of inventory control.

Structure of the Chapter:

- 19.1 Objectives:
- 17.2 Classification of Inventory
- 19.3 Economic Order Quantity
- 19.4 Trial and error method
- 19.5 Fixation of Inventory Levels
- 19.6 ABC Analysis
- 19.7 VED Analysis
- 19.8 FNSD Analysis
- 19.10 Exercise
- 19.11 Practical Exercise

19.1 Objectives:

At the end of this chapter the students will learn about –

- Different types of inventory
- Different cost associated with inventory management
- Techniques for inventory controls

19.2 Classification of Inventory

The inventory of a manufacturing concern is classified into the following types:

- **Raw Materials:** It includes direct material used in the manufacture of a product and it also includes the components, fuels etc. used in the manufacture.
- **Work-in-Progress:** It included semi finished goods and materials, sub-assemblies etc held between manufacturing stages. Stock of work-in-progress are in the process of production.
- **Finished goods:** The goods ready for sale or distribution will come under this category.

The classification of inventory of a particular firm depends upon the nature of business it carries. For a spinning mill cotton is the raw material and yarn is the finished product. But in case of textile mill, yarn is the raw material and fabric is the finished product. A manufacturing concern's inventory consist of all the above three types of inventory but incase of a trading concern, the first two categories will not appear in their stocks.

The Production Manager and Finance Manager of a manufacturing company should know the item of inventory, classification of inventory, and costs related to each item of inventory before taking any step for efficient management of inventory. The efficiency shown in inventory will have direct impact on profitability of a business enterprise. By proper management of inventory all cost associated with inventory management can be reduced to a great extent. In our study about management of inventory, here, we only discuss about the first category of inventory i.e., raw materials.

For efficient management of inventory the following techniques are used:

19.3 Economic Order Quantity

The Economic Order Quantity (EOQ) is an optimum quantity of materials to be ordered so that the different costs associated with inventory can be minimized. Main costs associated with inventory management can be classified as under.

Ordering Costs

Also known as purchase cost or set up cost, this is the sum of the fixed costs that are incurred each time an item is ordered. These costs are not associated with the quantity ordered but primarily with physical activities required to process the order.

- The costs of ordering inventory include the following:
 - Where goods are manufactured internally, the set up and tooling costs associated with each production run.
 - Intermittent costs of chasing orders, rejecting faulty goods
 - Documentation processing costs
 - Transport costs
 - Costs of receiving goods
 - Additional costs of frequent or small quantity orders

Preparation of purchase order Carrying Costs

Also called Holding cost, carrying cost is the cost associated with having inventory on hand. It is primarily made up of the costs associated with the inventory investment and storage cost. For the purpose of the EOQ calculation, if the cost does not change based upon the quantity of inventory on hand it should not be included in carrying cost. In the EOQ formula, carrying cost is represented as the annual cost per average on hand inventory unit. Below are the primary components of carrying cost.

- The carrying costs of inventory include the following:
- Pilferage and damage costs
- Obsolescence and deterioration costs
- Audit, stock taking or perpetual inventory costs
- Required rate of return on investment in current assets
- Stores staffing, equipment maintenance and running costs
- Insurance and security costs
- Handling costs
- Costs of money tied up in inventory
- Storage costs (rent, lighting, heating, refrigeration, air-conditioning etc.)

Storage Costs

Mistakes in calculating storage costs are common in EOQ implementations. Generally companies take all costs associated with the warehouse and divide it by the average inventory to determine a storage cost percentage for the EOQ calculation. This tends to include costs that are not directly affected by the inventory levels and does not compensate for storage characteristics. Carrying costs for the purpose of the EOQ calculation should only include costs that are variable based upon inventory levels.

Stock-out Costs – The stock-out costs are associated with running out of stock which include in following:

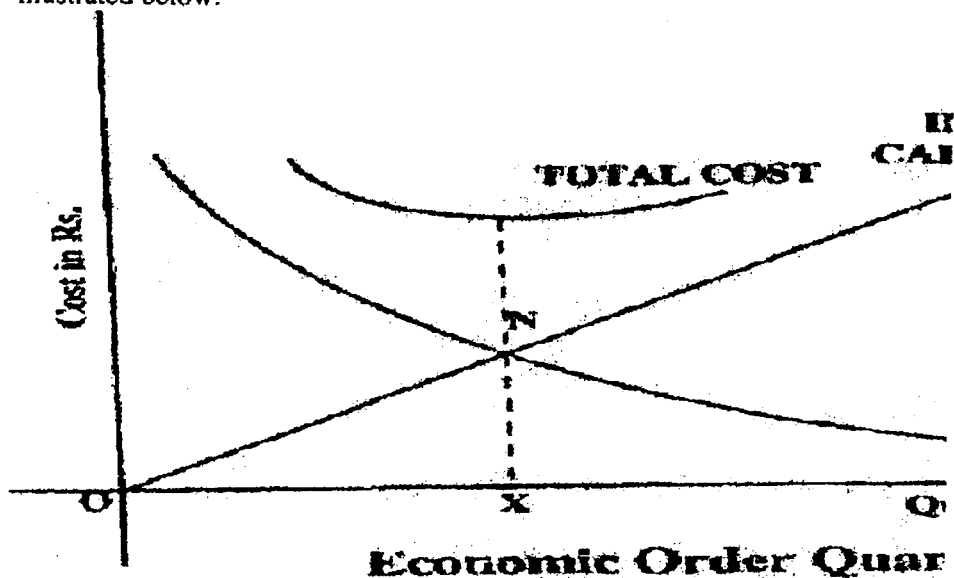
- Extra costs associated with urgent, often small quantity, replenishment purchases.
- Labour frustration over stoppages
- Loss of customer goodwill
- Cost of production stoppage caused by stock outs of WIP or raw material
- Loss of future sales because customers go elsewhere
- Lost contribution through the lost sales caused by the stock-out

The EOQ is the optimum size of the order for a particular item of inventory calculated at a point where the total inventory costs are at a minimum for that particular stock item. It is an optimum size of either a normal outside purchase order or an internal production order that minimizes total annual holding and ordering costs of inventory. Stock-out costs are difficult to incorporate in this model. Since they are based on qualitative and subjective judgment.

The ordering costs are the costs of placing a separate order multiplied by the number of separate orders placed in the period. The carrying costs can be calculated

based on the assumption that annual cost of carrying a particular stock item on average, half the stock is on hand all the time in addition to the safety or buffer stock. The fewer the orders, the lower costs of ordering, but the greater the size of the order the greater the costs of carrying.

Graphical determination of EOQ – The EOQ can also be determined graphically as illustrated below:



In the above diagram, upward moving straight line shows that inventory carrying cost increases with the quantity ordered. The downward sloping curve indicates that ordering cost per unit decreases with the increase in quantity ordered. The U-shaped curve shows that total cost of decreases with the increases in quantity ordered upto point X. After this point it increases with quantity ordered. In other words, total cost is the lowest when OX quantity is ordered. Hence OX is the economic ordering quantity. It should be always remembered that economic ordering quantity is always obtained at the point of intersection between inventory carrying cost line and ordering cost line.

The following formula is used in calculation of EOQ:

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

Where

A = Annual consumption

B = Buying cost per order

C = Cost per unit

S = Storage and other inventory carrying cost

Navjot Ltd. produces a product which has a monthly demand of 4,000 units. The product requires a component X which is purchased at Rs. 20. For every finished product, one unit of component is required. The ordering cost is RS. 120 per order and the holding cost is 10% p.a.

You are required to calculate:

- ii. Economic order quantity
- iii. If the minimum lot size to be supplied is 4,000 units, what is the extra cost, the company has to incur?
- iv. What is the minimum carrying cost, the company has to incur?

(i) Economic order quantity
 $EOQ = 2AB$

$$\frac{2 \times 48,000 \times 120}{2 \times 0.10 \times 48,000} = 2,400$$

Where,

- A = Annual consumption
 4,000 units' p.m. x 12 = 48,000 units
- B = Ordering cost per order = Rs. 120
- C = Cost per unit = Rs. 20
- S = Holding Cost = 10% p.a. or 0.10

$$EOQ = \frac{2 \times 48,000 \times 120}{2 \times 0.10 \times 48,000} = 2,400$$

(ii) Statement showing inventory carrying cost if the minimum lot size to be purchased is 4,000 components

Ordering cost (48,000 units / 4,000 units x Rs. 120)	1,440
Carrying cost (1/2 x 4,000 units x Rs. 20 x 10/100)	4,000
Total	5,440

Statement showing inventory carrying cost if the minimum lot size to be purchased is 2,400 components

Ordering cost (48,000 units / 2,400 units x Rs. 120)	2,400
Carrying cost (1/2 x 2,400 units x Rs. 20 x 10/100)	2,400
Total	4,800

Extra cost = Rs. 5,440 - Rs. 4,800 = Rs. 640

- (i) Calculation of minimum carrying cost if EOQ is not adopted:
 Monthly demand = 4,000 components
 Minimum carrying cost = 1/2 x 4,000 units x Rs. 20 x 10 / 100
 = Rs. 4,000.

EOQ with discounts – Sometimes it may happen that suppliers may offer discount for ordering large quantity. Such price discounts can be incorporated into the EOQ formulas, but it becomes much more complicated. A similar approach is to consider the costs associated with the normal EOQ and compare these costs with the costs at each succeeding discount point and so ascertain the best quantity to order. Price discounts for quantity purchase have three financial effects, two of which are beneficial and one adverse.

- Beneficial Effects:
- Adverse Effects:

Increased costs arise from the extra stockholding costs caused by the average stock level being higher due to the larger order quantity.

Savings will come from:

- Lower price per item, and
- The large order quantity means that fewer orders need to be placed so that ordering costs are reduced.

19.4 Trial and error method –

Under this method economic order quantity is found without using any formula. Here different alternative quantity of orders are considered randomly and for all the alternatives ordering cost, carrying cost and purchase cost are found and the quantity at which the total cost is minimum will be selected as EOQ. The whole procedure can be illustrated as follows.

The inventory requirement of a company for the year is 30,000 units of raw material. The ordering costs in Rs. 80 per order and carrying costs are expected to be Rs. 0.10 per unit. It can make purchases in lot of 30,000 units, 15,000 units, 7,500 units, 5,000 units and 2,500 units.

Find out the economic order quantity with the help of trial and error approach.

Solution :

Table showing Inventory Costs

1. Purchases (units)	30,000	15,000	7,500	5,000	2,500
2. No. of Orders	1	2	4	6	12
3. Cost per Order	Rs. 80	Rs. 80	Rs. 80	Rs. 80	Rs. 80
4. Total Ordering Costs	Rs. 80	Rs. 160	Rs. 320	Rs. 480	Rs. 960
5. Carrying Costs (per unit)	Rs. 0.10	Rs. 0.10	Rs. 0.10	Rs. 0.10	Rs. 0.10
6. Average Inventory (units)	15,000	7,500	3,750	2,500	1,250
7. Total Carrying Costs	Rs. 1,500	Rs. 750	Rs. 375	Rs. 250	Rs. 125
8. Total Costs (Ordering + Carrying Costs)	Rs. 1,580	Rs. 910	Rs. 695	Rs. 730	Rs. 1,085

The above calculations make it clear that when 7,500 units are purchased the total costs is the lowest and so economic order quantity is 7,500 units.

19.5 Fixation of Inventory Levels

Various levels of inventory are fixed to see that no excess inventory is carried and simultaneously there will not be any stock outs. The following inventory levels are fixed for each item of stock:

Reorder Level:

Re-order level is the level of stock availability when a new order should be raised. The store department will initiate the purchase of material when the stock of material reaches at this point. Following formula is useful for this purpose:

$$\text{Reorder level} = \text{Maximum Usage} * \text{Maximum lead time}$$

Thus The inventory level at which a replenishment order should be placed. Often referred to as the "min" of a min-max policy.

Minimum Stock Level: Minimum stock level is the lower limit below which the stock of any item should not normally be allowed to fall. Their level is also called safety stock or buffer stock level. The main object of establishing this level is to protect against stock out of a particular stock item

$$\text{Minimum stock level} = \text{Re-order level} - (\text{Average or Normal usage} * \text{Average lead time})$$

Maximum Stock Level: Maximum stock level represents the upper limit beyond which the quantity of any item is not normally allowed to rise to ensure that unnecessary working capital is not blocked in stock items. Maximum stock level can be expressed in the formula given below:

$$\text{Maximum level} = \text{Re-order level} + \text{Economic Re-ordering quantity} - (\text{Minimum usage} * \text{Minimum lead time})$$

Danger Level: Danger level of stock is fixed below the minimum stock level and if stock reaches below this level, urgent action for replenishment of stock should be taken to prevent stock out position.

$$\text{Danger level} = \text{Average consumption} * \text{Lead time for emergency purchases}$$

Average Stock Level

$$\text{Average stock level} = \frac{1}{2} (\text{Minimum stock level} + \text{Maximum stock level}) \text{ or } = \text{Minimum stock level} + \frac{1}{2} \text{ Re-order quantity}$$

The following data relate to a particular stock item of Mac Ltd.:

Normal usage	110 per day
Minimum usage	50 per day
Maximum usage	140 per day
Lead time	25-30 days

EOQ previously calculated 5,000 units

Using the above data calculate stock levels.

$$\begin{aligned}
 \text{Ans. Re-order level} &= \text{maximum usage} \times \text{maximum lead time} \\
 4,200 \text{ units} &= 140 \times 30 \\
 \text{Minimum level} &= \text{Re-order level} - \text{Average usage for average} \\
 &\quad \text{Lead time} \\
 &= 4,200 - (110 \times 27.5) = 1,175 \text{ units} \\
 \text{Maximum level} &= \text{Re-order level} + \text{EOQ} - (\text{Minimum usage} \times \text{minimum lead time}) \\
 &= 4,200 + 5,000 - (50 \times 25) \\
 &= 7,950 \text{ units}
 \end{aligned}$$

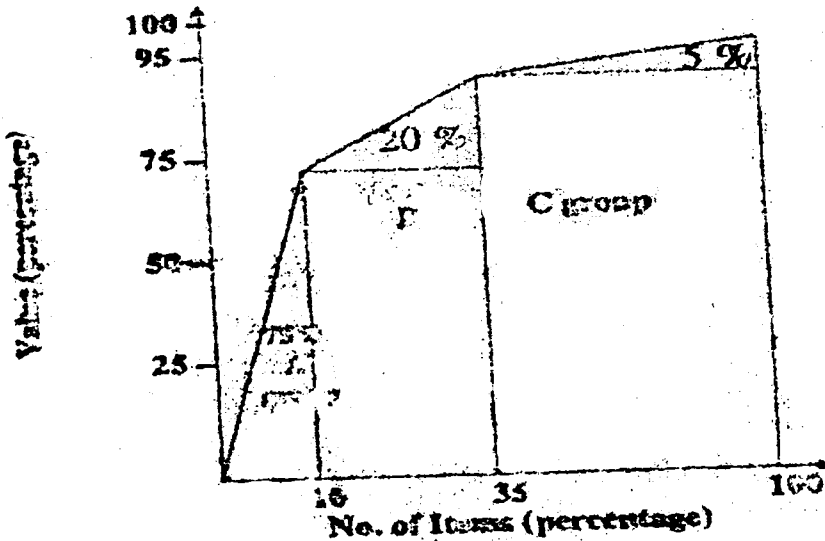
19.6 ABC Analysis

In this technique, the items of inventory are classified according to value of usage. This method divides inventory into three classes A, B and C. Items in class 'A' constitute the most important class of inventories so far as the proportion (or percentage) in the total value of inventory is concerned. Items in class B constitute an intermediate position while those in item 'C' are quite negligible. Inventories are distributed in different categories so that more concentration can be kept on category A type of inventory because though they have less quantity but as they are more in value.

It is seen a very small percentage of the items say 10% accounts for 75% of the total material usage which will fall in category 'A' and large number of items say 65% of the total items accounting 5% of the monetary value which will fall in category 'C'. And the inventory falling in middle of A and C will be denoted as B. ABC analysis divided the total inventory list into three classes using the rupee volume. The A items consist of approximately to 10% of the total items, B items and next 25% and C consist remaining 65% items. The numbers are just indicative and actual breakup will vary from situation to situation. The above categorization is represented below:

Category	% of items	% of value
A	10	75
B	25	20
C	65	5
Total	100	100

It shows ABC analysis of inventory class 'A' is made up of inventory items which are either very expensive or used in massive quantities. Thus these items, though few in number contribute a high proportion of the value of inventories. Class 'B' items are not so few in number. Value wise also they are neither very expensive nor very cheap. Moreover, they are used in moderate quantities. Class 'C' contains a relatively large number of items. But they are either very inexpensive items or used in very small quantities so that they do not constitute more than a negligible fraction of the total value of inventories. Following graph will explain the concept.



Thus Prioritize items:

Sort sales inventory and discontinued items into A, B, and C classifications, where the 'A' items are critical to your business, the 'B' items are less controlled, and the 'C' items have minimal activity and need little attention and review.

19.7 VED Analysis

This type of analysis divides items into three categories in the descending order of their criticality. Here V stands for vital items and that is vital for running of business and their stock analysis requires more attention, because out of stock situation for such items will result in stoppage of production. Thus, V items must be stored adequately to ensure smooth operation of the plant. E means essential items. Such items are considered essential for efficient running but without these items the system would not fail. Care must be taken to see that they are always in stock. D stands for desirable items which do not affect the production immediately but availability of such items will lead to more efficiency and less fatigue. This method analysis items based on their criticality and so it can be used for those special raw materials which are difficult to procure.

19.8 FNSD Analysis

FNSD analysis divide the items into four categories in the descending order of their usage rate. F stands for fast moving items and stocks of such items are consumed in a short span of time. N means normal moving items and such items are exhausted over a period of a year or so. S indicates slow moving items; existing stock of which would last for two years or more at the current rate of usage but it is still expected to be used up. D stands for dead stock and for it existing stock no further demand can be foreseen. Stocks of fast moving items must be observed constantly and replenishment orders be placed in time to avoid stock-out situations. Slow moving stock must be reviewed very carefully before any replenishment orders are placed. The order levels and quantities for such items should be on the basis of a new estimate of future demand, to minimize the risks of a surplus stock being left when a slow-moving item becomes obsolescent or dead. Dead stock figures in the inventory represent money spent that cannot be realized but it occupies useful space. Hence, once such items are identified, efforts must be made to find all alternative uses for it. Otherwise, it must be disposed of.

19.9 Practical

I.Idea Ltd. manufactures a product and the following particulars are collected for the year ended March, 2001:

Monthly demand	(units)	1,000
Cost of placing an order	(Rs.)	100
Annual carrying cost	(Rs. Per unit)	15
Normal usage	(unit per week)	50
Minimum usage	(unit per week)	25
Maximum usage	(in units per week)	75
Re-order period	(weeks)	4-6

You are required to calculate:

- Re-order Quantity
- Re-order level
- Minimum level
- Maximum level
- Average stock level

Ans. (i) RE-order Quantity = $\frac{2AB}{CS}$

CS

Where, A= Annual Consumption (units) during the year

B= cost of placing an order

CS= Annual carrying cost per unit

= $2 \times 2,600 \times \text{Rs. } 100$

= 196 units (approx.)

Note: Since normal usage is 50 units per week the annual consumption for the year is = 52 weeks x 50 = 2,600 units.

(ii) Re-order level = Maximum Re-order period or Maximum delivery period x Maximum usage

= 6 weeks x 75 = 450 units

(iii) Minimum level = Re-order level - (Normal usage x Average delivery period or Normal re-order period)

$$= 4540 \text{ units} - (50 \text{ units} \times 5 \text{ weeks}) = 200 \text{ units}$$

(iv) Maximum level = (Re-order level + Re-order quantity) - (Minimum usage x Minimum delivery period or Minimum re-order period)

$$= (450 \text{ units} + 196 \text{ units}) - (25 \text{ units} \times 4 \text{ weeks}) = 536 \text{ units}$$

(v) Average stock level = (Maximum level + Minimum level) / 2

$$= 536 \text{ units} + 200 \text{ units} / 2 = 368 \text{ units.}$$

2. Calculate the Economic Order Quantity from the following data of Moon Ltd:

1. Annual consumption of a material	12500 units
2. Price per unit	Rs.5
3. Insurance cost per unit	Rs.0.70
4. Interest costs per unit	Rs.0.20
5. Storing cost per unit	Rs.0.10
6. Cost of placing an order	Rs.10

Solution:

$$\text{EOQ} = \frac{\sqrt{2AO}}{C}$$

A = Annual consumption 12500 units

$$= \frac{\sqrt{2 \times 12500 \times 10}}{1.0}$$

O = Cost of placing an order Rs.10

$$= \frac{\sqrt{250000}}{1.0}$$

C = Carrying cost Rs.1 (0.70 + 0.20 + 0.10)

$$\text{EOQ} = 500 \text{ Units}$$

The annual requirements of a Super Ltd. for a certain material is 6000 units and its orders quantity of 1500 units currently. Its ordering costs per order is Rs.160 and carrying cost per unit is Rs.11. If the firm orders 2000 units or more it is offered a discount of 0.75 percent. The unit cost of the material is Rs.90. Say whether the order size should be increased from 1500 to 2000 units.

Solution:

(A) If the Discount offer is accepted:

$$(1) \text{ Discount} = A \times P \times N$$

$$= 6000 \times \text{Rs. } 90 \times 0.75\%$$

$$= \text{Rs.4050}$$

Where A = Annual consumption
P = Price per unit
N = Rate of discount

(B) Saving in Ordering Costs:

If purchases are made as per EOQ, then

$$\text{the number of order} = \frac{6000}{1500} = 4$$

$$\text{Total ordering cost at Rs.160} \times 4 = \text{Rs.640}$$

If purchases are made in lots of 2000

$$\begin{aligned} & \text{Units to avail the discount, then the} \\ & \quad \quad \quad 6000 \\ \text{the number of order} & \quad \quad \quad \frac{\quad}{2000} = 3 \\ & \text{Total ordering cost at Rs.160 x 3} \quad = \text{Rs.480} \\ & \quad \quad \quad \text{Saving} = \text{Rs.640} - \text{Rs.480} \quad = \text{Rs.160} \\ \text{Total savings} & = \text{Rs.4050} + \text{Rs.160} \quad = \text{Rs.4210} \end{aligned}$$

(C) Increase in Carrying Costs:

$$\text{Average inventory to avail discount } 2000/2 = 1000 \text{ units}$$

$$\text{Average inventory in case of EOQ } 1500/2 = 750 \text{ units}$$

$$\therefore \text{Additional Carrying costs} = \text{Rs.10} (1000 - 750)$$

$$= 11 \times 250$$

$$= \text{Rs.2750}$$

$$\text{Difference} = \text{Total Savings} - \text{Additional Costs}$$

$$= \text{Rs.4210} - \text{Rs.2750}$$

$$= + \text{Rs.1460}$$

As the difference is positive, the offer of discount can be accepted and order may be placed for 2000 units.

3. Form the following details, draw a plan of ABC selective control for Sita Ltd.

Item	Units	Unit cost (Rs.)
1	7500	5.10
2	24500	3.10
3	2000	10.10
4	600	22.10
5	38500	1.60
6	40500	0.60
7	60500	0.30
8	3500	3.60
9	300	8.10
10	29500	0.30
11	12000	7.20
12	4600	6.30

Note: Place the items valued at more than Rs.50000 in group A and items valued at less than Rs.15000 in group C.

Solution:

Statement of Total Cost and Ranking

Item	Units	Cost per Unit	Total Cost Rs.	% of Total cost	Ranking
1	7500	5.10	38250	10.10	4
2	24500	3.10	75950	20.07	2
3	2000	10.10	20200	5.34	7
4	600	22.10	13260	3.50	9
5	38500	1.60	61600	16.02	3

6	40500	0.60	24300	6.42	6
7	60500	0.30	19150	4.79	8
8	3500	3.60	12600	3.33	10
9	300	8.10	2430	0.64	12
10	29500	0.30	8850	2.33	11
11	12000	7.20	86400	22.83	1
12	4600	6.30	28980	7.65	5
			378370	100.00%	

Looking to the standard of classification given in the example, items no. 11, 2 and 5 are valued at more than Rs.50000 and hence, they would be placed in group A. Items no. 4, 7, 10, 8 and 9 are valued at less than Rs.15000 and so they would be placed in group C. The remaining items no. 1, 12, 6 and 3 fall between Rs.15000 and Rs.50000 and so they would be placed in category B. Thus ABC classification would be as follows:

A group: Items 11, 2 and 5 with rank 1, 2 and 3. Out of total 12 items, these 3 items form around 25 % of the total and the total cost of the three is $86400 + 75950 + 61600 = \text{Rs.}223950$ which amounts to 53% of the total value of inventory Rs.378370.

B group: Items 1, 12, 6 and 3 and their rank are 4, 5, 6 and 7, out of total 12 items, these are 4 items which constitute around 33 1/3% of the total. The total value of all the four is $38250 + 28980 + 24300 + 20200 = \text{Rs.}111730$, which is 29.52 % of the total value of Rs.378370.

C group: Items 4, 7, 10, 8 and 9, their ranks are 8, 9, 10, 11 and 12. Out of total 12 items, these are 5 items which is around 41 % of the total. Their total value $\text{Rs.}19150 + 13260 + 8850 + 12600 + 2430 = 55290$ which is 14.61 % of the total value of inventory Rs.378370.

Thus the classification is as follows:

	A group	B group	C group
Item No.	2, 5, 11	1, 3, 6, 12	4, 7, 8, 9, 10
No. of items	3	4	5
% of total items	25%	33 -- %	41 -- %
Total value	Rs.223950	Rs.111730	Rs.55290
% value of total	53%	29.52%	14.61%

4. The annual inventory requirement of a Opera Ltd. is 30,000 units. The ordering cost is Rs. 150 per order. Its carrying cost per unit is Rs. 1.20 per unit.

Suppose the ordering quantity is as follows : (1) 30,000 units (2) 15,000 units (3) 6,000 units (4) 3,000 units (5) 1,500 units (6) 750 units.

Determine the following on the basis of above information :

(1) Ordering cost (2) Carrying cost (3) Average inventory (4) Economic Ordering quantity.

Solution :

(1)	Purchases (units)	30,000	15,000	6,000	3,000	1,500	750
(2)	Number of Orders	1	2	5	10	20	40
(3)	Ordering cost per unit (Rs.)	150	150	150	150	150	150
(4)	Ordering cost – Total (Rs.)	150	300	750	1,500	3,000	6,000
(5)	Carrying cost per unit (Rs.)	1.20	1.20	1.20	1.20	1.20	1.20
(6)	Average Inventory	15,000	7,500	3,000	1,500	750	375
(7)	Total carrying cost (Rs.)	19,000	9,000	3,600	1,800	900	450
(8)	Total cost (Rs.) (carrying cost + ordering cost)	19,150	9,300	4,350	3,300	3,900	6,450

The above calculation show that when 3,000 units are purchased, the total cost is the minimum and so the economic ordering quantity is 3,000 units.

19.10 Exercise

Answer the following questions:

1. Explain term 'inventory'? Give a note on different types of inventory maintained in a business?
2. Give a note on need for inventory management?
3. Write a note on EOQ method of inventory management?
4. Explain terms. Re-order level, minimum level, maximum level and average level in inventory management.
5. Write a note on ABC analysis for inventory management?
6. Write a note on VED analysis for inventory management?
7. Write a note on FSND method for inventory management?

19.11 Practical Exercise

1. Determine the Economic Order Quantity for Diamond Ltd. from the following information:

- | | |
|-----------------------------------|--------------|
| (1) Total annual consumption | 120000 units |
| (2) Annual carrying cost per unit | 15% |
| (3) Ordering cost | Rs.24 |
| (4) Purchase price per unit | Rs.15 |

2. Following information is available as regards consumption of a certain material of Venus Ltd. Calculate Ordering Level, Minimum Level, Maximum Level and Safety Level.

Ordering quantity	3900 units
Re-order period	4 to 6 weeks
Maximum consumption	750 units per week
Minimum consumption	250 units per week
Normal consumption	500 unit per week

Calculate Ordering level, Minimum level, Maximum level and Safety level.

3. To decide to buy an item the following data are given by Super Ltd.:

Annual demand 900 units

Ordering cost Rs.300

Holding cost 40%

Cost per unit Rs.15

Discount 10% if the order quantity is 500

What should be the decision whether EOQ should be ordered or benefit of discount should be considered? Justify your answer.

Assume that in case of discount, order is made only once of 900 units.

4. The following details are available in respect of a firm:

Annual requirement of inventory, 42,000 units

Cost per unit (other than carrying and ordering cost), Rs 16

Carrying costs are likely to be 15 per cent per year

Cost of placing order, Rs 490 per order

Determine the economic order quantity.

5. Two components, A and B are, used as follows:

Normal usage	55 units each per week
Minimum usage	25 units each per week
Maximum usage	75 units each per week
Re-order quantity	A: 320 units; B: 500 units
Re-order period	A: 4 to 6 weeks; B: 2 to 4 weeks

Calculate for each component:

(a) Reorder level

(b) Minimum level

(c) Maximum level

(d) Average stock level.

6. Soliam Company estimates its carrying cost at 16 per cent and its ordering cost at Rs 9 per order. The estimated annual requirement is 38,000 units at a price of Rs 4 per unit. What is the most economical number of units to order and how often will an order need to be placed?

7. A manufacturer buys casting equipment from outside suppliers @ Rs 30 per unit. Total annual needs are 800 units. The following further data are available:

Annual return on investment, 10 per cent

Rent, insurance, taxes per unit per year, Re 1

Cost of placing an order, Rs 120 _____

Determine the economic order quantity.

8. The P.C. Company has been buying a given item in lots of 1,200 units which is a six months' supply, the cost per units is Rs 12, order cost is Rs 8 per order, and carrying cost is 28 per cent. You are required to calculate the savings per year by buying in economical lot quantities.

9. The Ganges Pump Company uses about 78,000 valves per year and the usage is fairly constant at 6,250 per month.

The valve costs Rs 1.50 per unit when bought in quantities and the carrying cost is estimated to be 20 per cent of average inventory investment on an annual basis. The cost to place an order and process the delivery is Rs 19.

It takes 45 days to receive delivery from the date of an order and a safety stock of 3,250 valves is desired. You are required to determine:

(a) The most economical order quantity and frequency of orders.

(b) The order point.

(c) The most economical order quantity if the valves cost Rs 4.50 each instead of Rs 1.50 each.

9. From the following data determine EOQ: (i) Annual requirement, 14,00,000 units (ii) Purchase price, Rs 3 per unit (iii) Ordering cost, Rs 50 per order (iv) Carrying cost of, inventory, 10 per cent of cost

10. Product Y is sold in packages of 12 units for Rs 20 per package. After a number of years, it has been determined that the demand for product Y is at a constant rate of 2,200 packages per month. The cost price per package of the selling company is Rs 10. The company requires a three day lead time from date of order to date of delivery. The ordering cost is Rs 1.30 per order and the carrying cost is 10 per cent per annum.

You are required to calculate the following:

(a) The EOQ. (b) The number of orders needed per year.

11. (a) From the following information, determine EOQ:

(i) Per month consumption: 75 units

(ii) List price per unit: Rs 5.

(iii) Trade discount: 28 per cent from the list price,

(iv) Per order cost: Rs 10.

(v) Carrying cost: Re 0.20 per unit.

(vi) The usage is assumed to be uniform throughout the year.

(b) Determine the value per order.

12. Modern Stores is trying to determine the economic order quantity for a certain type of transformer. The firm sells 260 numbers of this transformer annually at a price of Rs. 200 per piece. The purchase price per transformer to the firm is, however, Rs. 150. The cost of carrying a transformer is Rs. 30 per year and the cost of placing an order is Rs. 230.

(a) What is the total cost associated with placing one, two, five, and ten orders per year?

(b) What is the economic order quantity?

13. Hitubhai Company requires 12,000 units of a certain item per year. The purchase price per unit is Rs. 25; the carrying cost per year is 26 per cent of the inventory value; and the fixed cost per order is Rs. 300.

(a) Determine the economic order quantity.

(b) How many times per year will inventory be ordered, if the size is the equal to the EOQ?

(c) What will be the total cost of carrying and ordering inventories when 10 orders are placed per year?

14. Consider the following data for a certain item purchased by Magnovex Limited.

Annual usage = 6,500 units

Fixed cost per order = Rs. 400

Purchase price per unit = Rs. 120

Carrying cost = 20 per cent of inventory value

What is the economic order quantity?

Now, assume that a discount of Rs. 5 per unit is offered if the order size is 1,000 units. Should

Magnovex seek the quantity discount?

15. Nutan Enterprises requires 5,500 units of a certain item annually. The cost per unit is Rs. 30, the fixed cost per order is Rs. 300, and the inventory carrying cost is Rs. 6 per unit per year.

The supplier offers quantity discount as follows:

<i>Order Quantity</i>	<i>Discount Percentage</i>
1,000	6
2,000	10

What should Nutan do?

Unit :19 : Management of Cash

Introduction:

Cash is needed in the business of various day to day expenses. The term cash here includes coins, currency, cheque held by the firm and the balance in its bank accounts. It also includes marketable securities and time deposits with the banks. The balance of cash in the business must be optimum, neither more nor less. If the balance of cash is lesser than what is actually required in the business then it affects the routine working of the business adversely. On the other hand if the firm holds surplus cash, this excessive cash remains idle, which simply increases the cost without contributing anything towards the profitability of the firm. So for avoiding both the above shown conditions, cash management is needed which mainly deals with ascertaining the minimum cash balance and controlling the level of cash as well as controlling cash inflows and outflows and making optimum investment of surplus cash.

Structure of the Chapter:

- 19.1 Objectives:**
- 19.2 Controlling the levels of cash**
- 19.3 Needs for holding cash:**
- 19.4 Cash Budgets :**
- 19.5 Advantages of Cash Budget :**
- 19.6 Performa cash budget**
- 19.7 Difficulties or Linitations of Cash Budget :**
- 19.8 Methods of Preparing Cash Budgets :**
- 19.9 Exercise**
- 19.10 Practical Exercise:**
- 19.12 Exercise**

19.1 Objectives:

At the end of this chapter the students will learn about –

- Need and Importance of cash in business
- Estimation of cash requirement
- Preparation of cash budget
- Advantage of cash budget

19.2 Controlling the levels of cash

For doing proper control of the cash, it is necessary to prepare cash budget which shows the expected cash inflows and outflows of the cash for a specific period of time for which the cash budget is prepared. Cash budgets may be prepared for any period of time a month, three months, six months or a year. By preparing cash budget, we can come to know about what will be the cash requirement during the period and whether enough cash inflows will be available to meet the outflows. If by preparing cash budget it is estimated that cash outflow is more than inflow during certain period then arrangement of deficit cash can be made from other sources to cop with the problem and so the routine activities are not disturbed.

For controlling the cash levels, we prepare cash budget but this budget is the estimation of future course of action and future is never certain. After preparing cash budget, a finance manager must ensure that there is no significant deviation between projected cash inflows and its actual receipts. Speedier collection of cash can be made possible by adaptation of the various techniques like lock box system or concentration banking. In lock box system, the firm hires a post office box and asks its customers to send the cheques to the box. The firm's local bank picks up the mail several times a day. Instructions are given to the local banks to transfer funds to Head Office Bank when they exceed a particular limit. By this way, the process of collection of cash will become speedier. Whereas in a concentration banking, the customers are required to send their payments to their nearest collection center. The firm opens bank accounts at those places. These cheque are the deposited into local banks. Instructions are given to those local banks to transfer funds telegraphically to the bank at head office. The finance manager sitting in the head office then disburses funds according to needs.

19.3 Needs for holding cash:

Cash is required in the business for various purposes. First of all, cash is needed for running day to day expenses of the business. These expenses includes purchase of raw material, packing material, wages, operating expenses etc. This can be treated as a very basic objective for which the cash is maintained in the business. If enough cash is not managed for providing for such expenses then it is difficult to run the business. Second purpose for holding the cash may be to fight with unforeseen circumstances like floods, strikes, sudden increase in price of materials or other expenses or unexpected delay in collection of accounts receivable. These are the circumstances in respect of which no predictions can be made well in advance. Such situation suddenly occurs and to cop with it becomes difficult for the firm if it does not have enough cash. Some times cash balance is kept with the firm for taking advantage of profitable opportunities which may not be available in the normal course of business. Such profitable opportunities do not arrive every day but when they arrive the firm must have enough cash to deal in such profitable opportunities and if in such situation enough cash is not available then the firm would lose the opportunities. After keeping necessary cash balance for all the above purposes if any balance of cash is left then it should be invested in the safest and profitable investment alternatives in such a way that it can be easily converted in to cash as and when needed.

19.4 Cash Budgets :

The firm has to hold adequate balance of cash-neither more nor less. So, it has to assess its need for cash properly. Cash Budget is a statement showing the estimated cash inflows and cash outflows for a particular period.

Cash budget occupies an important place in the financial management of a modern business enterprise, particularly in an enterprise running on large scale. It makes certain that the business has sufficient cash available to meet its needs as and when they arise. Thus Cash Budget is a forecasted summary of a firm's expected Cash inflows and cash outflows as well as its expected cash and Loan balances. Cash budget shows cash receipts from all sources and all payments and also the resultant cash balance on a definite time. In short, Cash budget means a statement projecting the future cash inflows and cash outflows of the company.

The cash budget is intended

- (i) To see that adequate amounts of cash are available for capital as well as revenue expenditures.
- (ii) To make proper arrangement of acquiring cash, if there is any expected shortage of cash.
- (iii) To see that surplus amount of cash is invested properly to earn maximum return.

19.5 Advantages of Cash Budget :

A cash budget is important for a variety of reasons. For one, it allows you to make management decisions regarding your cash position (or cash reserve). Without the type of monitoring imposed by the budgeting process, you may be unaware of the cycle of cash through your business. At the end of a year or a business cycle, a series of monthly cash budgets will show you just how much cash is coming into your company and the way it is being used. Seasonal fluctuations will be made clear.

A cash budget also allows you to evaluate and plan for your capital needs. The cash budget will help you assess whether there are periods during your operations cycle when you might need short-term borrowing. It will also help you assess any long-term borrowing needs. Basically, a cash budget is a planning tool for management decisions. Following are its advantages :

- (1) **Planned use of cash :** If the management has a clear idea about cash receipts and payments, they can plan out the use of cash. If cash payments are planned to be made when sufficient cash is available, it is possible to carry on business with the minimum of working capital. The cost of holding cash at optimum level would be minimum.
- (2) **Provision for Capital Expenditure :** It is useful in two ways. It shows whether capital expenditure projects can be financed internally. Secondly, it gives an idea about the timings when sufficient cash is available for capital expenditure. This would help in avoiding a situation when funds for capital expenditure may be required to be borrowed at high rate of interest.
- (3) **Investment of Surplus Funds :** It reveals the availability of excess cash. This can be invested in short term investments, if funds would be needed in near future in the business. It may be considered even for long term investments in some cases. Thus, it serves as a guideline for investment of surplus funds.
- (4) **Dividend Policy :** The cash budget may guide the management in deciding the dividend policy for the year. If the cash budget shows that the liquid position will

not be comfortable, the management may decide to reduce the rate of dividend or skip over dividend for the year.

- (5) **Profitable Use of Cash :** It guides the management when to get the benefit of cash discount or quantity discount for bulk purchases. It also will help the finance manager in making enough provision for cash requirements of seasonal purchases.
- (6) **Timely Payment of Debts :** Cash budget enables the finance manager to ascertain his cash position so that he can make payment for debts on maturity dates. Thus provision is made enough cash for payment of debts as and when they fall due.
- (7) **Arrangement for Obtaining Funds :** It guides the management in making decisions about whether funds for short term and long term purposes are to be borrowed or arranged in some other manner. if they are to be borrowed, in what manner.
- (8) **Useful for Control :** If the estimates for cash receipts and payment are made in advance, they can be compared with cash receipts and payments and the difference can be investigated. Thus the management can control the use of cash resources.
- (9) **Helps Co-ordination :** In fact, cash budget serves as a co-ordinator of all remaining budgets. For example, the revenue shown by sales budget determines the limits within which production and other service departments can spend money. Thus cash budget serves as a link between all budgets.
- (10) **Easy to Obtain Funds :** A concern preparing cash budget is able to meet its obligations in time on maturity. This creates goodwill for the concern in the money market. This helps the firm in raising funds whenever needed with ease from bank and other financial institutions.

19.6 Performa Cash Budget

Cash Budget

For three months from 1st Jan., 2002 to 31st March 2002

Particulars	January Rs.	February Rs.	March Rs.
Cash Balance			
Receipts :			
(1) Cash Sales			
(2) Collection from debtors			
(3) Receipts from bills receivable			
(4) Interest and dividend			
(5) Sale of fixed asset			
(6) Receipts from loan, debentures etc.			
(7) Receipts from shares issued			
(8) Others			
Total Receipts (a)			

Payments : 1. Cash purchases 2. Payment to creditors 3. Wages and salaries 4. Administrative expenses 5. Selling expenses 6. Purchase of fixed asset 7. Repayment of loan 8. Payment of taxes Total Payment (b) Closing Cash Balance (a-b)			

19.7 Difficulties or Limitations of Cash Budget :

Cash budget, if properly framed and implemented, is immensely useful. But following difficulties and limitations must also be taken into account.

- (1) **Estimates are Difficult :** There are many uncertainties in business. It is therefore, difficult to have near accurate estimates of cash receipts and payments, particularly for a longer period. It is of course not difficult to estimate them for next three to four months period. But the long term estimates are likes to go astray in many cases.
- (2) **Carelessness in implementation :** If proper care is not exercised in implementing the cash budget, it will become only a mental exercise. The actual cash receipts and payments would not conform to the estimates, leading to frequent changes in them.
- (3) **Rigidity :** If the finance manager does not show flexibility in implementing the cash budget, it will lead to undesirable situation. A manager strictly believing in his estimates of cash inflow, many resort to strict collection policy, which may result in losing customers. Similarly strict adherence to payments schedule may lead to difficult liquid position and reduced profitability.
- (4) **Expensive :** Difficult mathematical models are used for long term estimates of receipts and payments. It requires collection of data from various sources, employing experts in operations research etc. This becomes expensive which small firms cannot afford. Besides, such experts are not easily available.

19.8 Preparation Cash Budgets :

There are three main components necessary for creating a cash budget. They are:

- Time period
- Desired cash position
- Estimated sales and expenses

Time Period

The first decision to make when preparing a cash budget is to decide the period of time for which your budget will apply. That, a budget is for the next three months, six months, twelve months or some other period?

Cash Position

The amount of cash Company wish to keep on hand will depend on the nature of the business, the predictability of accounts receivable and the probability of fast-happening

opportunities (or unfortunate occurrences) that may require to have a significant reserve of cash.

Company may want to consider their cash reserve in terms of a certain number of days' sales. The budgeting process will help them to determine if, at the end of the period, they have an adequate cash reserve.

Estimated Sales and Expenses

The fundamental concept of a cash budget is estimating all future cash receipts and cash expenditures that will take place during the time period. The most important estimate you will make, however, is an estimate of sales. Once this is decided, the rest of the cash budget can fall into place.

Methods of Preparing Cash Budget

The method to be used for preparing cash forecast depends upon the circumstances and needs of the business. There are generally three methods used for preparing cash budget :

(1) Receipts and Payments Method

We discuss these method in details :

(1) Receipts and Payments Method : This is the most widely-used and popular method of preparing cash budget. The estimates under this method may be divided into weekly, fortnightly or monthly basis. The method is of particular importance in business where sale is unstable, or seasonal or which suffers from shortage of liquid resources. Due to its flexibility, this method is used in planning cash at various time periods and thus helps in controlling cash disbursements.

(a) Estimating Cash Receipts : The sources of cash receipts in a business are generally sales, non-operating incomes like interest and dividend as well as capital transactions like sale of assets and issue of shares and debentures. The first step in preparing a cash budget under this method is to estimates the sales; as sale is the most important source of cash receipts. Once the total sales are estimated, it is easy to put down the figures of cash sales. From the past experience, the proportion of cash sales can be determined. Any changes likely to occur in the future budget period are taken into account. There is no time-lag between sales and receipts in respect of cash sales.

However, estimating collection from credit sales is a little difficult problem. The credit policy of the firm, the past experience etc. affect the receipts are likely. Suppose the debtors ratio is 30 days, it means that collection from credit sale will be made in the next month i.e. collection from credit sales of December will be made in January. The fact the certain percentage of credit sale is not received in time must all be taken note of. Besides, the terms of sale, discount policy, seasonal variations, general business conditions must all be take into account while estimating collections. The receipts from discounting of bills or maturity of bills pose no problem, as they can be estimated on the basis of the term of the bills. Receipts from investments and other sources are comparatively easy to estimate.

(b) Estimating Cash Payments : Cash payments generally consist of payment to creditors on account of credit purchases, payments for wages, overhead expenses, dividends, capital expenditure like purchase of assets, repayment of loans, etc. the estimates on various accounts are based on various operating budgets, e.g. payment to creditors are estimated on the basis of purchase budget, for wages and

factory overhead, the basis will be production budget etc. In estimating payments to creditors, the credit period allowed by suppliers, cash discount etc. must be considered. The payment on account of capital expenditure can be estimated on the basis of Capital Expenditure budget. Overheads can also be based on overheads budget. Of course, adjustments like depreciation and accruals should not be taken into account. Payment on account of dividend may be a difficult problem. But in case of companies which adopt stable dividend policy, it is easy to estimate the total amount of dividend payable.

The closing cash balance every month will be available by deducting total cash payments from cash receipts. This gives an idea of either cash balance or cash deficiency and in the latter case, the finance manager will have to make arrangement for bank overdraft. There are two factors which determine whether the cash balance is enough or not : first, the actual payments to be made next month and the actual timings of such payments. For example, if the collection from sales is available only after 15th of the month, the enough cash balance must be maintained for meeting payments for the first 15 days.

19.9 Exercise

1. Explain the principal motives for holding cash.
2. Explain the techniques that can be used to speed up firm's collection.
3. Explain the term 'Concentration Banking' and 'Lock-Box System'.
4. What strategies can be followed to slow disbursement of accounts payable ?
5. Discuss the utility of cash budget as a tool of cash management.

19.10 Practical Exercise:

1: From the following information, prepare a monthly cash budget for Ravish Ltd. for 3 months ending 31st March : (i) Revenue is expected to be Rs. 90,000, Rs. 92,000 and Rs. 90,000 in the three months,

(ii) Purchase for December, January, February and March are likely to be

Rs. 80,000, Rs. 60,000, Rs. 65,000 and Rs. 70,000 respectively, 40 percent is paid in next month.

(iii) Rent per month is Rs. 4,000 and personal withdrawal Rs. 6,000.

(iv) Rs. 35,000 is expected to be outflows towards purchase of a vehicle in the month of March.

(v) Cash expenses are Rs. 14,000 for each month, (vi) Present cash balance is Rs. 15,000.

Solution :**CASH BUDGET for Quarter ending 31st March**

	JAN	FEB	MARCH
Receipts :			
Opening Balance	15,000	13,000	19,000
Receipts : Sales	90,000	92,000	90,000
Total Receipts (a)	1,05,000	1,05,000	1,08,000
Payments :			
Cash Purchase (60 % of current month)	36,000	39,000	42,000
Payment to creditors (40 % of last month)	32,000	24,000	26,000
Rent	4,000	4,000	4,000
Withdrawal	6,000	6,000	6,000
Cash expenses	14,000	14,000	14,000
Purchase of vehicle	-	-	35,000
Total Payments (b)	92,000	87,000	1,27,000
Closing Balance (a) - (b)	13,000	19,000	-31,000

2:

From the following data prepare Cash Budget from the period from 1st July to 31st December, 2002 when the opening cash balance is expected to be Rs. 50,000 for Roma Ltd. :

Month	Sales	Purchase	Wages	Factory expenses	Admini- stration expenses	Selling expenses
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
May	2,00,000	90,000	19,000	12,000	7,000	8,000
June	1,80,000	95,000	20,000	14,000	8,000	9,000
July	2,10,000	94,000	19,000	10,900	7,000	8,000
Aug.	1,70,000	94,000	15,000	13,000	5,000	8,500
Sept.	1,75,000	85,000	22,000	14,500	6,500	8,600
Oct.	2,20,000	72,000	19,000	11,000	7,200	9,300
Nov.	2,12,000	75,000	21,000	9,500	7,500	7,800
Dec.	2,50,000	65,000	20,000	10,000	7,400	6,500

Additional Information:

- (1) Machinery to be purchased for Rs. 60,000 in July will be payable on delivery.
- (2) Period of credit allowed by suppliers is 1 month and the same credit period is allowed to customers.
- (3) Wages are paid after one week, while factory administrative expenses and selling expenses are paid one month after the month in which they are incurred.
- (4) A sales commission of 2 1/2 % on sales is paid two months after sales.
- (5) Machinery to be purchased in August for Rs. 1,80,000 is payable in equal instalments in September and October.

Solution :

Notes: (1) As the credit period for sales is one month, the collection for credit sales during each month will be for the sale of the previous month, e.g. in July, the collection will be made for sales of June, i.e. Rs. 1,80,000. Similar calculations will be made for all the 6 months.

(2) Credit purchases will be similarly paid after one month; e.g. in July, payment will be made for the purchases of June, i.e. Rs. 95,000.

(3) Sales commission at 2 1/2% on sales of May will be paid in July. This will be 2 1/2 % of 2,00,000 = Rs. 5,000.

Thus the total selling expenses will be

Selling expenses of July	Rs. 9,000
+ Sales Commission on sales of May	Rs. 5,000
	Rs. 14,000.

Selling expenses of all the months will be calculated in the same manner.

(4) Wages are paid after one week. This means that 1/4 wages of June will be paid in July. Similarly 1/4 wages of July will be paid in August, i.e. 3/4 of wages of July only will be paid in July. Thus wages paid in July will be as follows :

1/4 wages of June Rs. 20,000	Rs. 5,000
3/4 wages of July Rs. 19,000	Rs. 14,250

Rs. 19,250 Wages for remaining 5 months will be similarly calculated.

(5) Other expenses of previous month will be paid during the current month, e.g. factory expenses of Rs. 14,000 of June will be paid in July.

(6) As there is a deficit of cash balance of Rs. 28,600 in October, an arrangement will have to be made with the bank for overdraft.

CASH BUDGET

For the period of 6 months from 1-7-2002 to 31-12-2002

Particulars	July Rs.	Aug. Rs.	Sept. Rs.	Oct. Rs.	Nov. Rs.	Dec. Rs.
Opening balance	50,000	19,750	90,250	24,250	28,600	67,275
Receipts :						
Sales collection	1,80,000	2,10,000	1,70,000	1,75,000	2,20,000	2,12,000
Total Receipts	2,30,000	2,29,750	2,60,250	1,99,250	1,91,400	2,79,275
Payments :						
Purchases	95,000	94,000	94,000	85,000	72,000	75,000
Wages	19,250	16,000	20,250	19,000	20,250	20,250
Factory Exp.	14,000	10,000	13,000	14,500	11,000	9,500
Adm. Exp.	8,000	7,000	5,000	6,500	7,200	7,500
Selling Exp.	14,000	12,500	13,750	12,850	13,675	13,300
Cap. Exp.	60,000	-	90,000	90,000	-	-
(Machinery)						
Total Payments	2,10,250	1,39,500	2,36,000	2,27,850	1,24,125	1,25,550
Closing Cash						
Balance	19,750	90,250	24,250	-28,600	67,275	1,53,725

3 :

Shankar Ltd. wishes to arrange overdraft facilities with its bankers during the period April to June, 2002 when it will be manufacturing mostly for stock. Prepare a cash budget for the above period from the following data indicating the extent of bank facilities the company will be require at the end of each month.

(A) Months	Sales Rs.	Purchases Rs.	Wages Rs.	Mfg. Exp. Rs.	Office Exp. Rs.	Selling Exp. Rs.
Feb.	1,80,000	1,24,800	12,000	3,000	2,000	2,000
March	1,92,000	1,44,000	14,000	4,000	1,000	4,000
April	1,08,000	2,43,000	11,000	3,000	1,500	2,000
May	1,74,000	2,46,000	12,000	4,500	2,000	5,000
June	1,26,000	2,68,000	15,000	5,000	2,500	4,000
July	1,40,000	2,80,000	17,000	5,500	3,000	4,500
August	1,60,000	3,00,000	19,000	6,000	3,000	5,000

(b) Cash on hand 1-4-2002 (estimated) Rs. 25,000.

(c) 50 % of credit sales are realised in the month following the sale and the remaining 50 % in the second month following. Creditors are paid in the month following the month of purchase :

(d) Lag in payment of manufacturing expenses 1/2 month.

(e) Lag in payment of other expenses 1 month. Solution]

CASH BUDGET

For 3 months April to June - 2002

	April Rs.	May Rs.	June Rs.
Receipts :			
Opening balance	25,000	44,500	- 66,750
Sales	1,86,000	1,50,000	1,41,000
	2,11,000	1,94,500	74,250
Payments .			
Purchases	1,44,000	2,43,000	2,46,000
Wages	14,000	11,000	12,000
Mfg. Exp.	3,500	3,750	4,750
Office Exp.	1,000	1,500	2,000
Selling Exp.	4,000	2,000	5,000
	1,66,500	2,61,250	2,69,750
Closing balance	44,500	- 66,750	- 1,95,000

Notes:

(1) Collection from credit sales in April will be as follows :

50 % of the credit sales of March	Rs. 96,000
50 % of the credit sales of February	Rs. 90,000
	Rs. 1,86,000

Collections from the credit sale will be calculated similarly for May and June.

(2) As the time lag of purchases is one month, the payment for March purchases will be made in April, April purchases will be paid in May and May purchases will be paid in June.

(3) Similarly, as the time lag for payment of wages, office expenses and selling expenses is one month, the payment will be made for the expenses of previous month i.e. March wages will be paid in April and so on.

(4) The time lag for manufacturing expenses is 1/2 month, which suggests that 1/2 month's expenses are paid in the next month. Thus in April, 1/2 mfg. expenses of March will be paid and 1/2 expenses of April will also be paid.

(5) The above budget shows that there will be a deficit of Rs. 66,750 in May, for which arrangement of bank overdraft will have to be made. Similarly, in June, an overdraft will have to be arranged for Rs. 1,95,500.

4 : Make out cash budget for October to December from the following information for Dubai Ltd. :

(1) **Cash and Bank Balance on 1-10-2002 Rs. 10,000.**

(2) **Sales Actual and Budgeted :**

June Rs. 30,000 (Actual) October Rs. 40,000 (Estimated)

July Rs. 32,500 (,,) November Rs. 41,000 (,,)

August Rs. 35,000 (,,) December Rs. 44,500 (,,) September, Rs. 37,500 (Estimated)

(3) **Purchases-Actual and Budgeted figures are :**

June Rs. 19,000 (Actual) October Rs. 24,000 (Estimated)

July Rs. 20,000 (,,) November Rs. 20,000 (,,)

August Rs. 24,000 (,,) December Rs. 25,500 (,,) September Rs. 22,500 (Estimated)

(4) **Wages and other expenses - Actual and budgeted :**

	Wages	Expenses
	Rs.	Rs.
August (Actual)	7,500	2,500
September (Actual)	7,500	3,000
October (Estimated)	9,000	3,000
November (Estimated)	9,000	4,000
December (Estimated)	10,000	4,000

(5) **Special:**

Advance payment of Income tax Rs. 2,500 in November. Purchase of Plant of Rs. 5,000 in October.

(6) **Rent payable in advance Rs. 150.**

(7) **10 % of purchases and sales are on cash terms.**

(8) **Time lag: Credit Sales 2 months**

Credit Purchases 1 month

Wages 1/2 month

Expenses 1/4 month

Solution

Cash Budget

For October to December, 2002

	October	November	December
	Rs.	Rs.	Rs.
Receipts :			
Opening Balance	10,000	6,450	5,300
Cash Sales	4,000	4,100	4,450
Collection from Debtors	31,500	33,750	36,000
Total Receipts	45,500	44,300	45,750
Payments :			
Cash Purchases	2,400	2,000	2,500
Credit Purchases	20,250	21,600	19,000
Wages	8,250	9,000	9,500
Expenses	3,000	3,750	4,000
Rent	150	150	150
Plant	5,000	—	—
Income-tax	—	2,500	—
Total Payments...	39,050	39,000	34,150
Closing Cash Balance	6,450	5,300	11,600

Notes:

(1) Every month 10% of sales is cash sales, so in October 10% of Rs. 40,000 = Rs. 4,000 will be received in cash. Similarly, during November 10 % of 41,000 = Rs. 4,100 will be received for cash sales and in December, 10 % of Rs. 44,500 = Rs. 4,450 will be received for cash sales.

(2) As the credit period for sales is 2 months, the customers will pay for credit sales, two months after the sale is made. Thus in October, collection will be made for credit sale made in August. Remember that credit sale is 90 % of the Total sales. In August the sale is Rs. 35,000 and 90 % of this will be Rs. 31,500, which will be collected in October. In November, collection from debtors will be 90 % of Rs. 37,500 which is sale of September. This will be Rs. 33,750. In December 90 % of October sale of Rs. 40,000 = Rs. 36,000 will be collected.

(3) Payment on account of cash purchases will be 10 % of the total purchases of each month. e.g. in October 10 % of 24,000 = Rs. 2,400 will be paid.

(4) Credit purchases will be 90 % of total purchases and payment will be made one month after. Thus in October, payment will be made for 90 % of purchases of September. i.e. 90 % × Rs. 22,500 = Rs. 20,250.

(5) As the time lag for wage is 1/2 month, 1/2 of the wages of September will be paid in October and 1/2 of October wages will be paid in October.

(6) As time lag for expenses is 1/4 month, in October 1/4 of September expenses will be paid and 3/4 of October expenses will be paid in October.

19.11 Exercise

1. From the following information of Mashru Ltd. prepare cash budget for the three months from April to June 2001 :

(i) On 1-4-2001, Bank Balance Rs. 1,00,000

(ii)

Month	Total Sale (Rs.)	Stock (Rs.)	Total Overhead expenses (Rs.)
March	1,20,000	30,000	36,000
April	1,50,000	33,000	48,000
May	1,80,000	36,000	42,000
June	1,50,000	33,000	48,000
July	1,80,000	30,000	36,000

(ii) Goods are sold by adding profit of $33 \frac{1}{3} \%$ on sale price.

(iii) All sales are made for cash.

(iv) Purchases are made for cash.

(v) Total overhead expenses include monthly expenses of Rs. 20,000 which is paid in the same month. Variable overhead expenses are paid in subsequent month.

(vi) An old machine is to be sold for Rs. 50,000 in April 2001. (vii) A new machine is to be bought for Rs. 50,000 in June 2001. the payment of which is made 50% against delivery and the remaining amount in the subsequent month.

(viii) Dividend of Rs. 30,000 for the year 2000-2001 is to be paid in June 2001.

2. From the following, prepare Cash Budget for Deshmukh Ltd. for the period from 1st March to 31st August 2002 when the opening Cash Balance would be Rs.20,000

Month	Sales	Selling Expenses	Purchases	Wages	Factory Expenses	Administrative and Selling Expenses
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
January	1,70,000	7,000	80,000	15,000	10,000	5,000
February	1,60,000	7,500	84,000	16,000	11,000	5,500
March	1,82,000	6,500	83,000	16,800	8,000	4,500
April	1,55,000	6,800	83,000	12,000	10,500	4,700
May	1,65,000	7,400	76,000	19,000	12,000	5,400
June	2,00,000	7,000	68,000	16,000	9,600	5,700
July	1,80,000	6,000	70,000	17,000	8,000	5,000
August	2,20,000	5,500	58,000	16,500	9,600	5,500

- (1) Period of credit allowed by suppliers and to customers : 1 month.
- (2) Lag in payment of:
 - (a) Wages 1/8th month.
 - (b) Other expenses 1 month.
- (3) Machinery purchased for Rs. 50,000 in March payable on delivery.
- (4) Building purchased in April for Rs. 1,50,000 payable in two equal instalments in May and July.
- (5) Commission at 3 % on sales payable two months after sales.

3. Prakash Ltd. closes its books on 31st March each year. On 1st January 2002 it wants to prepare a cash forecast for the first quarter of the ensuing year. The following information is available : Sales (as per budget):

March, 2002 Rs. 50,00,000 May, 2002 Rs. 55,00,000

April, 2002 Rs. 60,00,000 June, 2002 Rs. 70,00,000

The details of cost of sales for month of March :

Materials Rs. 22,50,000 Variable Overheads Rs. 5,00,000

Wages Rs. 7,50,000 Fixed Overheads Rs. 7,50,000

Fixed overheads include an amount of Rs. 2,00,000 for depreciation on plant and machinery.

1/5 of the sales are for cash and rest on credit. Customers are allowed a credit period of one month, which happens to be the credit period allowed by the suppliers also.

Wages and variable overheads are paid in the month which follows that in which they are incurred. Material and labour costs are strictly variable. Fixed overheads to be paid in the same month.

During June, 2002 Income-tax of Rs. 6,00,000 is to be paid. The staff are to be paid a bonus of Rs. 3,00,000 in May. A uniform gross profit on variable cost is maintained by the company.

The cash balance in hand on 1st April is expected to be Rs. 2,00,000

Prepare cash forecast for the 3 months and also suggest how the shortfall or excess can be filled up or utilised as the case may be. Assume that each month's production is sold out in full.

4. Draw out Cash Budget of Ashok Trading Co. Ltd. for April to June, 2002 from the following information :

(1) Cash and Bank balances on 1-4-2002 Rs. 40,000.

(2) Sales : Actual and budgeted :

	Actual		Budgeted
	Rs.		Rs.
January, 2002	1,40,000	April, 2002	1,40,000
February, 2002	1,50,000	May, 2002	1,60,000
March, 2002	1,30,000	June, 2002	1,30,000

(3) Purchase - Actual and budgeted

	Actual		Budgeted
	Rs.		Rs.
January, 2002	70,000	April, 2002	70,000
February, 2002	80,000	May, 2002	90,000
March, 2002	70,000	June, 2002	70,000

(4) Wages and expenses - Actual and budgeted :

Feb. 2002 22,000 10,000 April, 2002 20,000 12,000
 March, 2002 16,000 12,000 May, 2002 25,000 14,000
 June, 2002 16,000 14,000

(5) Machinery to be purchased for Rs. 50,000 in April, 2002.

(6) Income-tax to be paid for Rs. 40,000 in May, 2002.

(7) Rent Rs. 700 payable each month, not included in expenses.

(8) 80 % of purchases and sales are on credit terms.

(9) Time lag: Credit sales 2 months

Credit purchases 1 month

Wages 1 1/2 month

Expenses 1/4 month

5. Prepare a Cash Budget for 3 months ending 31 st December, 2001 from the following information of Prerna Limited :

Cash Balance as on 1st October, 2001 Rs. 50,000.

Months	Total Sales	Total Purchases	Wages	Overheads
	Rs.	Rs.	Rs.	Rs.
August	2,00,000	1,00,000	30,000	50,000
September	2,50,000	1,40,000	24,000	60,000
October	3,00,000	2,00,000	32,000	45,000
November	4,00,000	1,50,000	26,000	55,000
December	4,50,000	2,50,000	40,000	70,000

- (1) Assume 20 % of total sales to be cash sales.
- (2) 5 % of credit sales are returned by the customers in every month of sales.
- (3) Commission on sales at 2 % on total net sales, is to be paid within a month, following actual sales.
- (4) 50 % of credit sales are realised in the month, following the sales and the remaining 50 % in the second month following sales :
- (5) Assume 10 % of total purchase to be cash purchases. The period of credit allowed by suppliers is one month.
- (6) The time lag in the payment of wages is 1/4 month and the time lag in the payment of overheads is 1/2 month.
- (7) Equity dividend at 10 % on the capital of Rs. 5,00,000 is payable in December, 2001.
- (8) Plant costing Rs. 1,00,000 is due for delivery in September, payable 15 % on delivery and the balance in December, 2001.

6. Prepare a Cash Budget for three months ending 30th June, 2002 from the following information of Namrata Limited : Cash Balance as on 1st April, 2002 Rs. 45,000 :

Months	Total Sales	Credit Sales Return	Total Purchases	Wages	Over-heads
	Rs.	Rs.	Rs.	Rs.	Rs.
February	2,80,000	4,000	2,65,000	26,000	46,000
March	3,20,000	6,000	2,40,000	28,000	30,000
April	4,00,000	10,000	2,80,000	24,000	44,000
May	3,60,000	8,000	3,00,000	32,000	50,000
June	3,40,000	12,000	3,20,000	36,000	60,000

- (1) Assume the proportion for cash sales and credit sales as 1 : 4.
- (2) Assume 20 % of total purchases to be cash purchases.

- (3) 50 % of net credit sales are realised in the month following the sales and remaining 50 % in the second month, following the sales.
- (4) The period of credit allowed by suppliers is one month.
- (5) The time lag in the payment of wages is 1/4 month and time lag in the payment of overheads is 1/2 month.

7. Maya Ltd. has seasonal sale. The cost of the goods in terms of % of the selling price is as follows :

Materials	20%
Wages	10%
Factory Expenses	20%
Depreciation	<u>10%</u>
	<u>60%</u>

• Sales proceeds forecasts are as follows :

Month (1999)	Sales (Rs.)
January	3,00,000
February	5,00,000
March	6,00,000
April	8,00,000
May	8,00,000
June	10,00,000
July	10,00,000

Additional information is as Follows :

- (1) Credit sales are 75 % and cash sales 25 % of the total sales.
- (2) The company purchases materials a month before its requirement. Purchases of materials are on credit.
- (3) Time Tag :
 Credit Sales 2 months
 Credit purchases 1 month
 Wages 1/2 month
 Factory Expenses 1/2 month.
- (4) A sum of Rs. 2,00,000 is to be paid every month in respect of fixed administration expenses.
- (5) Income-tax Rs. 50,000 is payable in May, 1999.

(6) Cash and bank balances on 1-4-99 (estimated) Rs. 20,000. Prepare Cash Budget for three months ending June 1999.

8. Prepare a Cash Budget for three months ending 31 st December, 2001 from the following information of Daipan Limited. Cash Balance on 1st October 2001, Rs. 1,20,000.

Year and Month	Total Sales	Total Purchases	Wages	Overheads
	Rs.	Rs.	Rs.	Rs.
2001 August	3,00,000	1,40,000	40,000	80,000
September	4,00,000	2,00,000	50,000	1,10,000
October	4,50,000	1,60,000	60,000	1,20,000
November	5,00,000	2,40,000	70,000	1,30,000
December	6,00,000	3,00,000	80,000	1,50,000

Additional Information:

- (1) Assume the proportion of cash sales and credit sales as 1 : 4.
- (2) Assume 20 % of total purchases to be cash purchases.
- (3) Assume 2 % of credit sales to be sales return every month.
- (4) 50 % of net credit sales are realised in the month following the sales and remaining 50 % in the second month following the sales.
- (5) Plant costing Rs. 1,00,000 is due for delivery in October, 2001 payable 10 % on delivery and the balance after three months.
- (6) Sales Commission 5 % on total Net Sales, is to be paid in the next month after actual sales.
- (7) The period of credit allowed by suppliers is one month.
- (8) Overheads include Rs. 5,000 depreciation per month on fixed assets.
- (9) The time lag in the payment of wages and overheads is one month.

9. Prepare a Cash Budget for three months ending on 30th June, 1996 from the following information of Shree Trivankal Ltd. Cash and Bank balance as on 1st April, 1996 Rs. 15,000. Cost of goods in terms of percentage of the selling price is as follows

Material 30 %

Wages 20 %

Factory overhead 25 %

The production and stock of finished goods in units for various months are as follows :

Month	Production (Units)	Stock of Finished Goods (Units)
February '96	3,000	500
March '96	4,000	1,500
April '96	3,500	1,000
May '96	4,500	500
June '96	6,250	1,250
July '96	4,750	1,000

Additional Information:

- (1) Cost Price is Rs. 100 per unit.
- (2) Selling price per unit is fixed at profit of 50 % on sales price.
- (3) Assume 60 per cent of total sales as credit sales and remaining cash sales.
- (4) 50 per cent of credit sales is collected in the month after sales and remaining 50 per cent in the second month after sales.
- (5) Anticipating sales of each month necessary purchases are made in the preceding month. 25 % is paid immediately and remaining amount is paid in the month after purchases.
- (6) The time lag in the payment of wages and factory overheads is one month.
- (7) Income tax paid for Rs. 15,000 in March while dividend is received for Rs. 10,000 in June.
- (8) Company's fixed assets are Rs. 1,00,000. Provide 10% depreciation on straight line method.
- (9) In April company is to purchase a machine of Rs. 3,00,000. The amount is paid after one month.

10. The projected sales of P.D.V. Ltd. for the months of July to November, 1995 are:

Year 1995	Rs.	Year 1995	Rs.
July	6,20,000	August	6,40,000
September	5,80,000	October	5,60,000
November	6,00,000		
The anticipated purchases are :			
Year 1995	Rs.	Year 1995	Rs.
July	3,80,000	August	3,33,000
September	3,50,000	October	3,90,000
November	3,40,000		

The wages are expected to be Rs. 1,00,000 per month. The management is expected to pay two months' wages as bonus during October, 1995. The Company is expected to pay an advance-tax for income-tax Rs. 90,000 before 15th September, 1995. The Company has ordered in June 1995 for a machine costing Rs. 16,00,000. IDBI has agreed to finance the purchase of Machine which is expected to be delivered in January 1996. The Company has advanced 5 % in June, 1995 with order, and they have agreed to pay another 10 % advance after 3 months. The Company extends 2 months' credit to its customers and the company enjoys one month credit from the suppliers.

The general expenses for the company are Rs. 60,000 per month payable at the end of each month. The company anticipates to receive interim dividend of 10 % for the investment of 90,000 equity shares of Rs. 10 each during October 1995. The Company anticipates to have an overdraft of Rs. 40,000 on 1st September, 1995 (Limit sanctioned is Rs. 55,000).

Draw a Cash Budget for September-November 1995 for approaching your bankers for a short-term further credit.

11. On the basis of following information, prepare a Cash Budget of Best Luck Ltd. for January to March 1997.

(1) Cash Balance on 1-1-97 Rs. 20,000.

(2) Sales : Actual and budgeted figures are :

Actual Rs.	Estimated Rs.	
Nov. 96 90,000	Jan. 97	1,25,000
Dec. 96 1,00,000	Feb. 97	1,40,000
	March 97	1,50,000

(3) Purchases (Actual and budgeted figures are) :

Actual Rs.	Estimated Rs.	
Nov. 96 56,000	Jan. 97	60,000
Dec. 96 58,000	Feb. 97	70,000
	March 97	75,000

(4) Direct wages and Manufacturing overheads budgeted :

Wages	Mfg. OH.	
Rs.	Rs.	
January '97 26,000	17,200	
February '97 30,000	19,200	
March, '97 32,000	19,200	

(5) All Sales are on credit. 40 % of these are collected in the month of sales, on which a cash discount of 10 % is allowed and the remaining 60 % of these are collected in the next month.

(6) Generally, all purchases are made for cash and cash discount of 10 % is allowed by the suppliers. But in the month of March 1997 the company buys on credit, payment can be deferred by one month by foregoing cash discount.

(7) The Budgeted manufacturing overheads include three months provision for depreciation amounting to Rs. 3,600.

(8) General overheads budgeted for (January to March '97) the quarter was Rs. 15,000 out of which Rs. 3,000 was for bad-debts reserve.

(9) Special: (a) Last Instalment of Advance Payment of Income-tax Rs. 16,000 is due in March.

(b) Purchase of plant of Rs. 54,000 in February.

12. From the following information of the Bhagvat Gita Co. Ltd. prepare Cash Budget for the three months from October-98 to December-98.

Month	Sales Rs.	Closing Stock Rs.	Total Overhead expenses Rs.
August	1,60,000	20,000	24,000
September	2,00,000	30,000	30,000
October	2,40,000	50,000	40,000
November	3,20,000	60,000	36,000
December	2,80,000	55,000	40,000
January	3,00,000	50,000	30,000

Additional Information :

(1) On 1-10-98 Bank Balance was Rs. 1,00,000.

(2) Goods are sold at a profit of $33\frac{1}{3}$ % on cost price.

(3) Purchases are made for cash.

(4) Cash sales are 40 % of the total sales. 50 % of credit sales are collected in the month after sales and remaining sales are collected in the second month after sales.

(5) Total overhead expenses include monthly fixed overhead expenses of Rs. 10,000, which is paid in the same month. Variable overhead expenses are paid in the subsequent month.

(6) An old machine is to be sold for Rs. 60,000 in November '98.

(7) A new machine is to be purchased for Rs. 1,00,000 in November '98, the payment of which is to be made 80 % against delivery and the remaining amount in the subsequent month.

(8) Income-tax is to be paid for Rs. 20,000 in November '98.

13. From the following data, prepare Cash Budget for the period from 1st July to 31st December, 1998 when the opening cash balance is expected to be Rs. 50,000.

Month	Sales Rs.	Purchases Rs.	Wages Rs.	Other Expenses Rs.
May	2,00,000	90,000	19,000	12,000
June	1,80,000	95,000	20,000	14,000
July	2,10,000	94,000	19,000	10,000
August	1,70,000	94,000	15,000	13,000
September	1,75,000	85,000	22,000	14,500
October	2,20,000	72,000	19,000	11,000
November	2,12,000	75,000	21,000	9,500
December	2,50,000	65,000	20,000	10,000

Additional Information:

- (1) A machinery of Rs. 60,000 purchased in July will be payable on delivery.
- (2) Period of credit allowed by the suppliers is one month and the same credit period is allowed to customers.
- (3) Wages are paid after two weeks and other expenses are paid after two months.

14. The following information is available relating to Vikalp Electricals Ltd :

Month	Sales forecasts (Rs.)	Purchase of Raw Materials (Rs.)
May	75,000	37,500
June	75,000	37,500
July	1,50,000	52,500
August	2,25,000	3,67,500
September	3,00,000	1,27,500
October	1,50,000	97,500
November	1,50,000	67,500
December	1,37,500	37,500
January	75,000	

Other Information :

(1) All sales are on credit as under :

Within the month of sale 5 %.

Within the month following the sale 80 %.

During the second month following the sale 15 %.

(2) Payment of raw materials is made in the month following the month of purchase.

(3) Miscellaneous :

- (a) Administrative salaries Rs. 11,250 per month.
- (b) Monthly lease rental Rs. 3,750.
- (c) Monthly depreciation Rs. 15,000.
- (d) Monthly sundry expenses Rs. 1,150.
- (e) Income tax paid : September Rs. 26,250 December Rs. 26,250
- (f) Payment for Research in October Rs. 75,000.
- (g) Opening balance of cash on July 1st Rs. 55,000.
- (h) Minimum cash balance of Rs. 37,500 should be maintained. Prepare a statement showing Cash Budget for six months – July to December and estimate excess or deficit cash for each month.

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