UNIT 4 WORKING CAPITAL DECISIONS

Structure **Page Nos.**

4.0 INTRODUCTION

The decisions regarding long-term investment are based on judgments on future cash flows, the uncertaininty of these cash flows and the opportunity cost of the funds to be invested. As far as working capital management decisions are concerned the underlying criteria are the same but, there is an increased focus on liquidity and management of operating cycle. Operating cycle refers to the time it takes to convert current assets (excluding cash) into cash. The operating cycle in part determines how long it takes for a firm to generate cash from current assets and therefore the risk and cost of its investment in current assets or working capital. Working capital is the capital that can be immediately put to work to generate the benefits of capital investment. Working capital is also known as current capital or circulating capital.

The major difference between long-term financial management and short-term financial management (also referred to as working capital management) is with regards to quantum and frequency of cash flows. In case of long-term financial management the amount of funds dedicated are usually large and one off decisions whereas, in case of short term financing the amount of funds dedicated are relatively small and frequently repetitive in nature. The impact of long term financing ranges over an extended period of time usually 15-20 years or more, whereas, the impact of short term financing is within the operating cycle usually ranging form three months to a year.

There are two concepts of working capital:

(i) Gross working capital

(ii) Net working capital

The gross working capital is the total of all current assets. Net working capital is the difference between current assets and current liabilities. The constituents of working capital are shown in *Table 4.1.* Part A of this table shows current assets and part B of this table shows current liabilities.

Table 4.1: Constituents of current assets and current liabilities

Part A	Part B
Current Assets Cash and Bank Balances Inventories Raw material and components, work in progress/process (WIP) finished goods, trade debtors, loans and advances, investments, pre-paid expenses	**Current Liabilities** Sundry Creditors Trade Advances Borrowings (short term) Outstanding expenses Taxes and dividends payable, Other liabilities maturing within a year

This unit deals with certain aspects and considerations related to overall working capital management and is divided into the following sections:

- characteristics of current assets
- factors influencing working capital requirements
- levels of current assets
- current assets financing policy
- profit criterion for current assets
- operating cycle analysis
- impact of inflation on working capital
- approaches to bank financing
- methods for estimating working capital requirements
- source of working capital finance

4.1 OBJECTIVES

After going through this unit, you would be able to:

- understand the concept and characteristics of working capital;
- understand the difference between net working capital and gross working capital;
- understand the concept of operating cycle;
- understand how the various factors influence working capital requirements; and
- understand the various methods of computing working capital.

4.2 CHARACTERISTICS OF CURRENT ASSETS

Working Capital management is influenced by two characteristics of current assets which are as follows (i) short life span (ii) swift transformation into other asset forms.

Current assets have a short life span, cash balances can remain idle for 7 to 14 days, while accounts receivable usually have a life span ranging from 30 to 90 days and inventories may be held for 30 to 100 days.

Each current asset is transformed into another current asset. This transformation will depend upon the time and degree of synchronisation of procurement, production, sales and collection of receivables.

The production process starts with the purchase of raw material resulting in either decrease in cash or creation of accounts payable. The raw material purchased from the inventory, which is further processed to produce finished goods. Finished goods are

sold resulting in either increase in cash or creation of accounts receivable while the discharge of accounts payable results in cash outflow. The current asset cycle and the operating cycle are shown in *Figures 4.1* and *4.2* respectively.

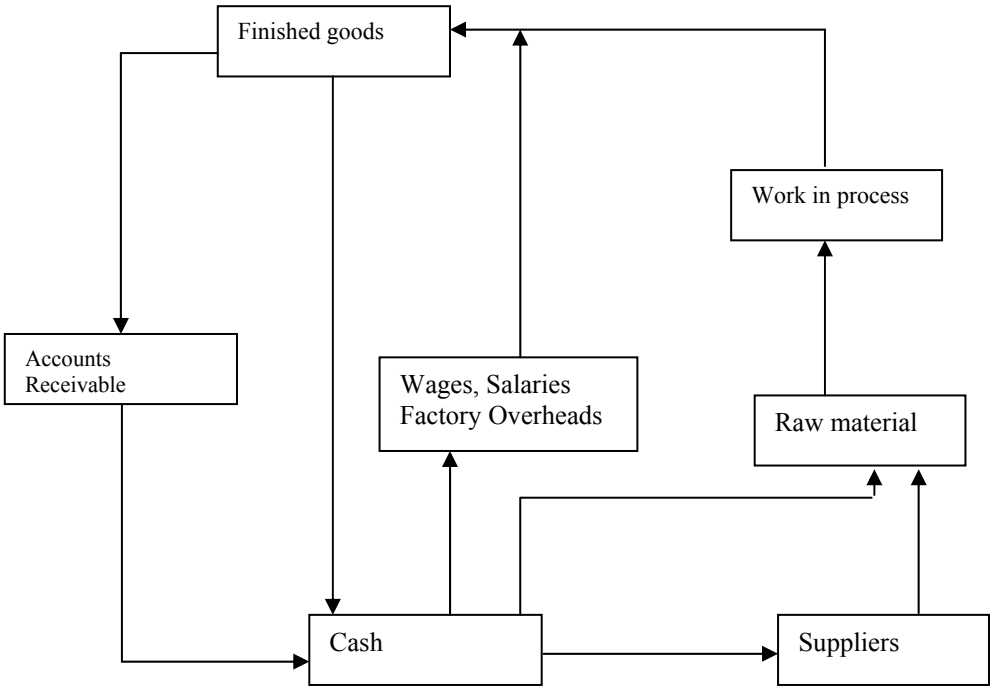

Figure 4.1: Current asset cycle

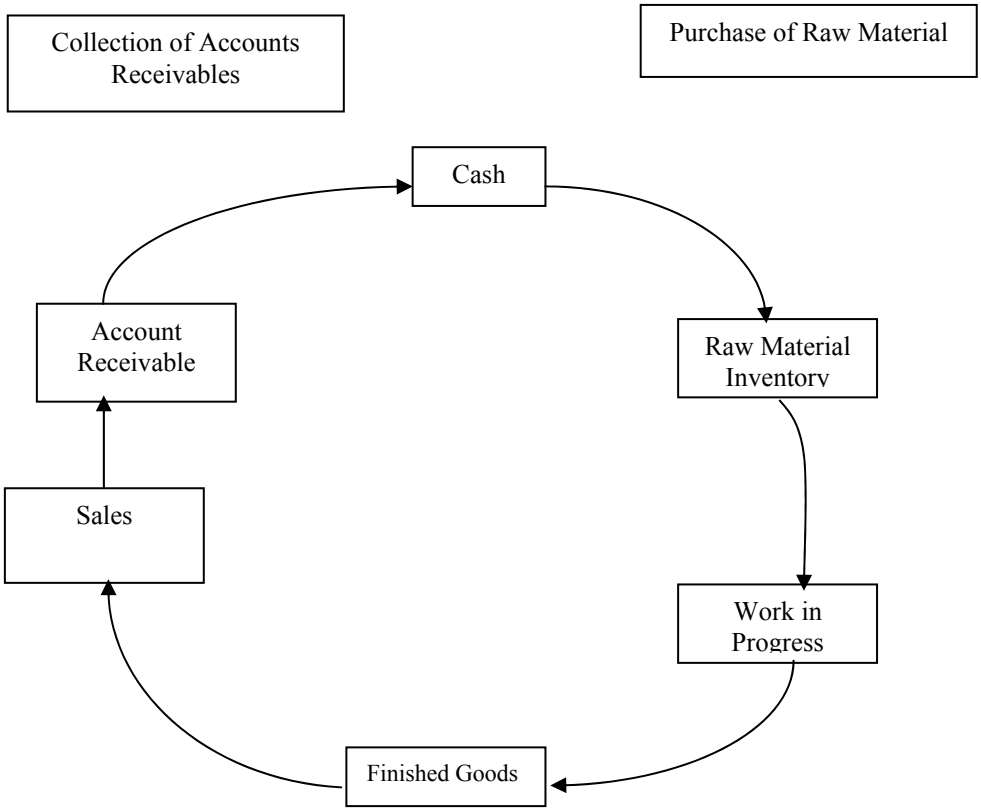

Figure 4.2: Operating Cycle

4.3 OPERATING CYCLE CONCEPTS

Operating cycle refers to the average time lapse between the acquisition of raw material and the final cash realisation. This concept is used to ascertain the requirements of cash working capital to meet the operating expenses. *Figure 4.3* depicts the operating cycle and the cash cycle.

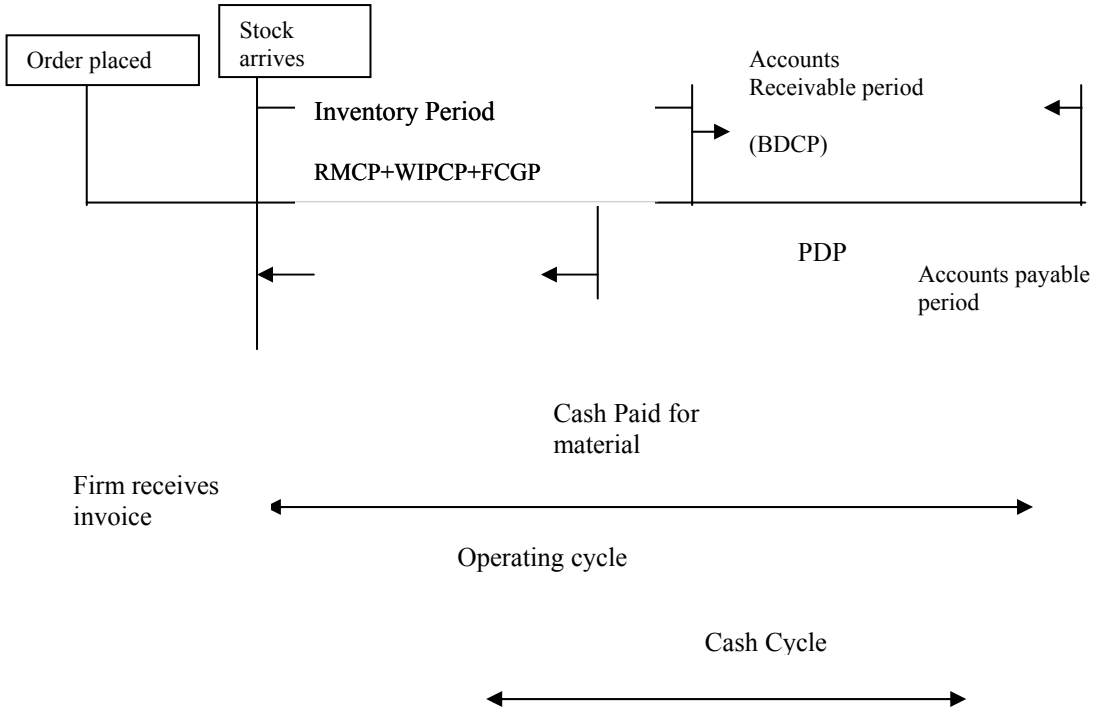

Figure 4.3: Operating cycle

From the above figure you can easily estimate that the time which lapses between the purchase of raw material and the collection of cash for sales is referred to as operating cycle, whereas the time length between payment of raw material purchases and collection of cash for sales is referred to as cash cycle.

In the operating cycle the inventory period consists of:

(i) Raw Material Conversion Period (RMCP), which is the time gap between purchase of raw material and the issuance of raw material for production.

(ii) Work in Progress Conversion Period (WIPCP), which is the time gap between issuance of raw material and the conversion of raw material into finished goods.

(iii) Finished Goods Conversion Period (FGCP), which is the time gap between sale of goods and the transfer of finished goods from shop floor to the warehouse.

(iv) Book Debt Collection Period (BDCP), which is the time gap between sales and realisation of cash

Now the length of the operating cycle for direct material can be calculated as follows:

Gross operating cycle = RMCP+WIPCP+FGCP+BDCP

Net Operating Cycle = Gross Operating Cycle – PDP
= RMCP+WIPCP+FGCP+BPCP-PDP

Where PDP is the Payment Deferral Period PDP is the credit time extended by suppliers to pay for the purchases.

4.4 FACTORS INFLUENCING WORKING CAPITAL REQUIREMENTS

The working capital needs of a firm are influenced by many factors. The important ones are as follows:

1. **Nature of business:** The working capital requirement of a firm is closely related to the nature of its business. In general businesses with short operating cycles will require lesser amount of working capital as compared to businesses with longer operating cycles. The firms engaged in manufacturing and trading will require more working capital as large amount of funds are locked in inventories and receivables. In general utility companies and service companies (water supply, electricity undertakings, telecom companies) will require lesser amount of working capital as compared to manufacturing and trading concern. Table 4.2 shows the relative proportion of investment in current assets and fixed assets of certain industries.

Table 4.2: Proportion of current assets and fixed assets

Current Assets %	Fixed Assets %	Industries
10-20 20-30	80-90 70-80	Hotels and restaurants Electricity generation and Distribution
30-40 40-50	60-70 50-60	Aluminum and Shipping Iron and Steel, Basic industries, Chemicals
50-60 60-70	40-50 30-40	Tea plantation Cotton textiles, Sugar
70-80 80-90	20-30 10-20	Edible oils, Tobacco Trading, Construction

2. **Business Cycle:** During economic boom there is increased production which require higher amount of working capital, but this is partly off set by reduced operating cycle. At the time of economic recession again there would be need for increased working capital, as large amount of funds would be locked in inventories and receivables.

3. **Seasonal Variations:** Commodities with seasonal demand results in increased level of working capital requirement. This could be offset by scaling down operations during the lean part of the year and increasing production prior to demand period. Products manufactured with raw materials, the production of which is seasonal (agricultural products) would require higher amount of working capital.

4. **Size of Business:** Size of the firm is also a determining factor in estimating working capital requirements. The size of a firm may be measured either in terms of scale of operations, or assets or sales. Large firms require more amount of working capital for investment in current assets and also to pay current liabilities than smaller firms. However, in some cases even a small firm may need more working capital as a cushion against cash flow interruptions.

5. **Change of Technology:** Changes in technology generally leads to improvements in the efficient processing of raw material, decrease in wastages, higher productivity and more speedy production. All these improvements lead to reduction in investment in inventories, which in turn leads to reduction in working capital requirement. If changed technology results in shorter manufacturing process the lesser would be the requirements of working capital.

6. **Length of Operating or Working Capital Cycle:** As explained in the section dealing with operating cycle concept of working capital the amount of working capital will depend upon the duration of operating cycle. The operating cycle in turn is dependent on many other variables such as length of manufacturing process, debtors collection period, etc.

7. **Firms credit policy:** The credit policy of the firm also impacts working capital needs. A firm following liberal credit policy will require more amount of working capital, as a large amount of funds would be blocked in debtors.

4.5 SOURCES OF WORKING CAPITAL

Sources of Working Capital Finance

Working capital finance may be classified into the following:

- **Spontaneous Source of Finance**

  Finance which naturally arise in the course of business is known as spontaneous financing. Trade creditors, credit from employees, credit from suppliers of services, etc., are the examples of spontaneous financing.

- **Negotiated Financing**

  Financing which has to be negotiated with lenders, say commercial banks, financial institutions, general public is known as negotiated financing. This kind of financing may either be short-term in nature or long-term.

  Before spontaneous and negotiated sources of finance, the latter is more expensive and inconvenient to raise. Spontaneous source of finance reduces the amount of negotiated financing. Working capital can be classified into long-term and short-term sources, which can be analysed as shown in *Figure 4.4*

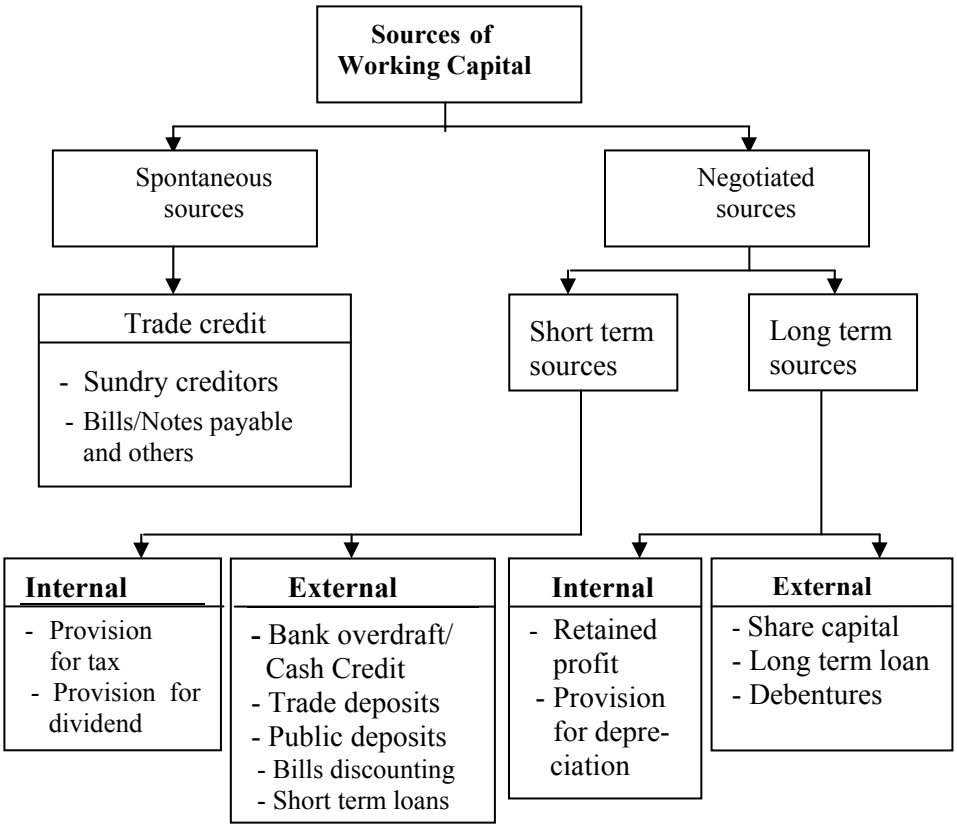

Figure 4.4: Financing Mix of Working Capital

- **Trade Credit**

Trade credit is a spontaneous source of finance which is normally extended to business organization depending on the custom of the trade and competition prevailing in the industry and relationship of the suppliers and buyers. This form of business credit is more popular since it contributes to about one-third of the total short-term credit. The dependence on this source of working capital finance is higher due to negligible cost of finance as compared to negotiated finances.

It is a facility whereby business firms are allowed by the suppliers of raw materials, services, components and parts, etc., to defer immediate payment to a definite future period. Trade credit is generated when a company acquires supplies, merchandise or materials and does not pay for them immediately. If a buyer is able to get the credit without any legal evidence or instrument, it is termed as *'Open Account Trade Credit'* and appears in the Balance Sheet of the buyer as sundry creditors. When an instrument is given, notably negotiable instrument, in acknowledgement of the debt, the same appears in the final statement as Bills or Notes payable.

- **Invoice Discounting or Factoring**

  If a company makes sales to a number of customers on credit terms it will have to wait for two or even three months before its debtors pay what they owe. This means that the debtors must be financed by the company, and the idea of factoring is to passover to the finance of debtors from the selling company to a special factoring, finance company or Bank. The factoring company after reviewing the amount of the debts and the creditworthiness of the debtors, will pay the selling company, at the end of the month in which the sales were made, the amount it can expect to receive from the debtors (less a percentage). In this way the selling company receives its money one or two months earlier than would normally be the case. The factoring company will then collect the debts from the selling company's customers when they fall due.

- **Bills of Exchange**

  A bill is defined as an unconditional order in writing, addressed by one person to another, signed by the person giving it, requiring the person to whom it is addressed to, to pay on demand, or at a fixed or determinable future time, a sum certain in money to or to the order of a specified person or to the bearer.

- **Funds Generated from Operations**

  Funds generated from operations, during an accounting period, increase working capital by an equivalent amount. The two main components of funds generated from operations are profit and depreciation. Working capital will increase along with the extent of funds generated from operations.

- **Deferred Tax Payments**

  Another source of short-term funds similar in character to trade credit is the credit supplied by the tax authorities. This is created by the interval that lapses between the earning of the profits by the company and the payment of the taxes due on them.

- **Accrued Expenses**

  Another source of spontaneous short-term financing is the accrued expenses that arise from the normal conduct of business. An accrued expense is an expense that has been incurred, but has not yet been paid. For most firms, one of the largest accrued expenses is likely to be employees' accrued wages. For large firms, the accrued wages held by the firm constitute an important source of

financing. Usually, accrued expenses are not subject to much managerial manipulation.

- **Working Capital Finance from Banks**

  Working capital is an essential requirement for any business activity. Banks in India today constitute the major suppliers of working capital credit to any business activity. Recently, however, some term lending financial institutions have also announced schemes for working capital financing.

- **Bank Overdrafts**

  Short-term borrowing of the kind made available principally by the clearing banks in the form of overdrafts is very flexible. When the borrowed funds are no longer required they can quickly and easily be repaid. It is also comparatively cheap. The banks will impose limits on the amount they can lend.

- **Line of Credit**

  Line of credit is a commitment by a bank to lend a certain amount of funds on demand specifying the maximum amount of unsecured credit the bank will permit the customer to borrow at any point of time. The bank will charge extra cost over the normal rate of interest since it will keep the funds available to be made use of the funds by the customer at all times.

- **Revolving Credit**

  The revolving credit facility will be given by the banker to the customer by giving certain amount of credit facility on a continuous basis. The borrower will not be allowed to exceed the limits sanctioned by the bank. Such credit facilities will be given by the banks to their customers in the form of over draft facility. In customer financing, credit cards are known for this source of financing.

- **Bridge Loans**

  Bridge loans are available from the banks and financial institutions when the source and timing of the funds to be raised is known with certainty. When there is a time gap for access of funds, then for speeding up of or implementation of the projects, bridge loans will be provided. Such loans are repaid immediately after raising the funds. The cost of bridge loans is normally higher than the working capital facilities provided by the banks. At present the RBI has put a restriction on banks in giving bridge loans to curb malpractices in capital market dealings.

- **Transaction Loans**

  These loans are provided by the Banker for short periods for a specific activity like financing for a civil contract work. When the customer receives payment, the transaction will be repaid by the customer. The lender will evaluate the ability of the cash flow of the borrower before sanctioning this type of loan.

- **Public Deposits**

  Deposits from the public is one of the important source of finance particularly for well established big companies with a huge capital base. The period of public deposits is restricted to a maximum of three years at a time and hence, this source can provide finance only for short term to medium term, which could be more useful for meeting the working capital needs of the company. It is advisable to use the amounts of public deposits for acquiring assets of long-term nature unless its pay back period is very short.

- **Suppliers Line of Credit**

  Under this scheme, non-revolving line of credit is extended to the seller to be utilised within a stipulated period. Assistance is provided to manufactures for promoting sale of their industrial equipments on deferred payment basis. While on the other hand, this credit facility can be availed of by actual users for purchase of plant/equipment for replacement of modernisation scheme only.

- **Hire Purchase and Leasing**

  It is a most familiar form of medium term financing in acquiring plant and machinery, vehicles, etc. In hire purchase transactions, the purchaser of goods will acquire the possession of goods on payment of initial deposit, but the title to the goods will only be passed on from seller to the purchaser after the payment of the remaining installments.

- **Intercorporate Loans and Deposits**

  In the present corporate world, it is a common practice of companies with surplus cash to lend to other companies for a short period normally ranging from 60 days to 180 days. The rate of interest will be higher than the bank rate of interest and will depend on the financial soundness of the borrower company. This source of finance reduces the intermediation of banks in financing.

- **Commercial Paper (CP)**

  The CP introduced into the Indian financial market, on the recommendations of the *Vaghul Committee* has become a popular debt instrument of the corporate world. CP is a debt instrument for short-term borrowing, that enables highly rated corporate borrowers to diversify their sources of short-term borrowings, and provides an additional financial instrument to investors with a freely negotiable interest rate. The maturity period ranges from three months to less than a year. Since it is a short-term debt, the issuing company is required to meet dealers' fees, rating agency fees and any other relevant charges. Commercial paper is short-term unsecured promissory note issued by corporations with high credit ratings.

  Salient Features:

  Eligibility Criteria: A company can issue CP only if:

  1) Its tangible net worth is not less than Rs. 4 crore as per the latest audited balance sheet;
  2) Its fund based working capital limit is not less than Rs. 4 crore;
  3) It has obtained the specified minimum credit rating for issuance of CP from an approved credit rating agency. Such credit rating should not be more than 2 months old at the time of issue of the CP;
  4) Its borrowal account is classified as 'standard' by the financing bank; and
  5) It has a minimum current ratio of 1.33:1 as per the latest audited balance sheet and the classification of current assets and liabilities are in conformity with the Reserve Bank guidelines issued from time to time.

- **Bank Guarantees**

  Bank guarantee is one of the facilities that the commercial banks extend on behalf of their clients in favour of third parties who will be the beneficiaries of the guarantees. In fact, when a bank guarantee is given, no credit is extended and banks do not part with any funds. There will be only a guarantee to the beneficiary to make payment in the event of the customer on whose behalf the guarantee is given, defaults on his commitment. So, if the customer fails to pay as per the terms of the guarantee, the banker giving the guarantee has to pay and

claim reimbursement from his client. The banker's liability arises only if this customer fails to pay the beneficiary of the guarantee. That is why bank guarantee limits are known as non-borrowings limits or not-fund limits.

- **Asset Securitisation**

  The emerging financial scenario has created a fierce competition among the companies to raise funds through innovative financial products from the capital and/or money markets. Additional source of capital can be accessed through securitisation, relieving the normal receivable/deposit collection process for finance companies and banks, without disturbing the liabilities side of the balance sheet. Companies can raise finance and increase their lending activity thus, enhancing profitability.

  Meaning:

  The term *'Securitisation'* refers to both switching away from bank intermediation to direct financing via capital market and/or money market, and the transformation of a previously illiquid asset like automobile loans, mortgage loans, trade receivables, etc., into marketable instruments.

  "Securitisation is a process of transformation of illiquid asset into security which may be traded later in the open market."

  "Securitisation is the process of transforming the assets of a lending institution into negotiable instruments."

- **Consortium Lending and Loan Syndication by Banks**

  When the individual bank finds it difficult to meet the huge financial requirements of a borrower, it gives rise to multiple banking which may be in the form of (i) Consortium Lending or (ii) Loan Syndication.

  Consortium Lending: When the financial needs of a single unit are more than a single bank can cater to, then more than one bank comes together to finance the unit jointly spreading the risk as well as sharing the responsibilities of monitoring and finance. The arrangement is called *'consortium lending'* and it enables the industrial units to mobilise large funds for its operations.

  Loan Syndication: There are two methods of syndication: direct lending and through participation.

  - **Direct Lending:** In respect of "direct lending" all the lenders sign the loan agreement independently with the borrower and agree to lend upto their respective share. The obligations of the syndicate members are several and they do not underwrite one another.

  - **Through Participation:** In this method of lending the lead bank is the only lending bank, so far as the borrower is concerned, that approaches the other lender to participate in the loan. This normally takes place without the knowledge of the borrower. The lead bank grants a certain portion of the loan to each participant as agreed. It also agrees to pay to the participants a *pro rata* share of receipts from the borrower.

4.6 STRATEGIES IN WORKING CAPITAL MANAGEMENT

So far banks were the sole source of funds for working capital needs of the business sector. At present more finance options are available to a Finance Manager to enable smooth functioning of his/her firm. Depending on the risk exposure of business, two strategies are evolved to manage working capital.

Conservative Working Capital Strategy

A conservative strategy suggests the carrying high levels of current assets in relation to sales. Surplus current assets enable the firm to absorb sudden variations in sales, production plans, and procurement time without disrupting production plans. 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 and encouragement for inefficiency. But a conservative policy will enable the firm to absorb day to day business risks. It assures continuous flow of operations and eliminates worry about recurring obligations. Under this strategy, long-term financing covers more than the total requirement for working capital. The excess cash is invested in short term marketable securities and in need, these securities are sold off in the market to meet the urgent requirements of working capital.

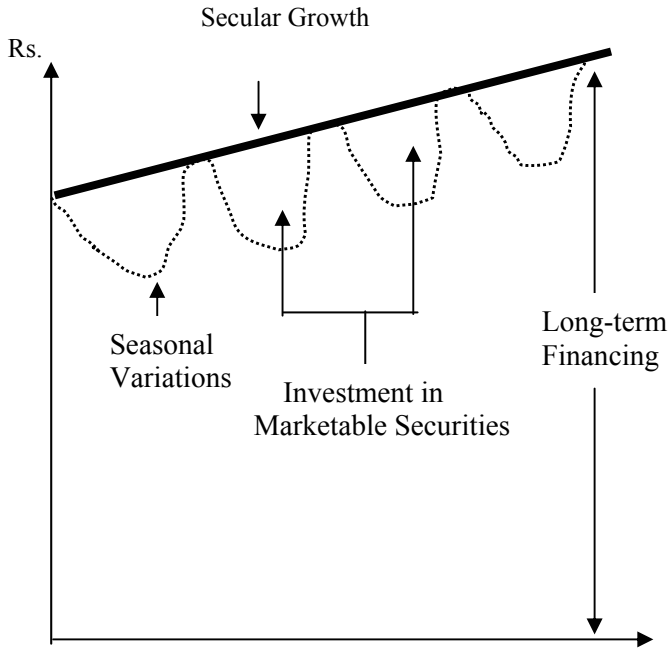

Figure 4.5: Conservative working capital strategy

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 is financed by long-term sources of capital, and seasonal variations are met through short-term borrowings. Adoption of this strategy will minimise investment in net working capital and ultimately lower the cost of financing working capital. The main drawback of this strategy is that it necessitates frequent financing and also increases risk as the firm is vulnerable to sudden shocks.

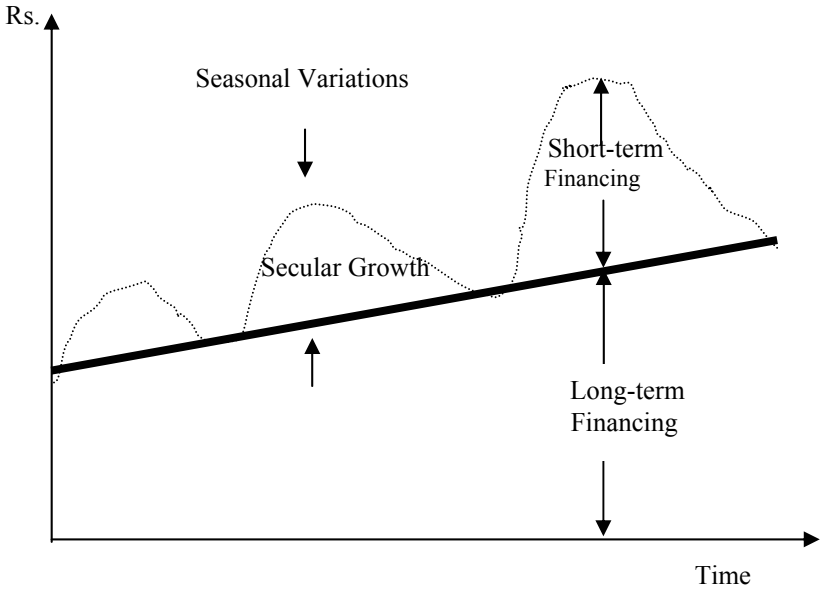

Figure 4.6: Aggressive Working Capital Strategy

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 the firm has to pay for adopting of this strategy is higher financing costs since, long-term rates will normally exceed short term rates. But when such an aggressive strategy is adopted, sometimes the firm runs into mismatches and defaults.
It is the 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.

4.7 ESTIMATING WORKING CAPITAL REQUIREMENTS

The most ticklish problem that is faced by the finance manager is the determination of the amount of working capital requirement at a particular level of production. To solve this problem, estimates of future requirements of current assets and cash flows are made. With the help of these cash flows, future requirements and availability of cash for current assets are ascertained. For this purpose a working capital forecast is prepared involving some calculations after taking into consideration the factors affecting working capital (as discussed above). All these calculations are made on cash basis. Thus, estimation of working capital is the determination of future cash requirements of a firm so that the liquidity of financial resources may be maintained. Following methods are generally used in estimating working capital for the future period:

a) Operating Cycle Method
b) Net Current Assets Forecasting Method
c) Projected Balance Sheet Method
d) Adjusted Profit and Loss Method
e) Cash Flow Forecast Method

a) **Operating Cycle Method**

Under this method, total operating expenses for a period are divided by the number of operating cycles in the relevant period to calculate the cash requirement for working

capital. Thus, the computation of total operating expenses, operating cycle period and number of operating cycles in the year is essential for estimating the amount of working capital, as discussed below:

1. **Operating Expenses:** These expenses include purchase of raw materials, direct labour cost, fuel and power, administrative and selling and distribution expenses for a specific period for which estimates can be obtained from cost records. Depreciation, write off of intangible assets are not included in these expenses because these are non-cash items. Similarly, tax and dividend being appropriation of profits are also excluded from these expenses. Capital expenses are also not included in it. While estimating the amount of these expenses fact like changes in product mix, introduction of a new product or discontinuation of an old product should be made for the changes occurring in expenses and price level due to internal and environmental factors.

2. **Operating Cycle Period:** Period of operating cycle means the total number of days involved in the different stages of operation commencing from the purchase of raw materials and ending with collection of sale proceeds from debtors after adjusting the number of days credit allowed by suppliers. Thus, the operating cycle is the total period involved in different stages of operations, which may be calculated by using the following formula:

$$OC = M+W+F+D-C$$

Here, OC = Operating Cycle Period
M = Material Storage Period
W = Work in Process or Conversion Period
F = Finished Goods Storage Period
D = Debtors Collection Period
C = Creditors Payment Period

$$\text{Material Storage Period (M)} = \frac{\text{Average Stock of Raw Materials}}{\text{Daily Average Consumption}}$$

Or

$$= \frac{(\text{Opening Stock} + \text{Closing Stock})1/2}{\text{Material Consumed for the Year}/365}$$

$$\text{WIP or Conversion Period (W)} = \frac{\text{Average Stock of Work-in-Process}}{\text{Daily Average Production Cost}}$$

OR

$$= \frac{(\text{Opening WIP} + \text{Closing WIP})/2}{\text{Total Production Cost}/365}$$

(a) Total Production or Factory Cost is calculated by adding opening stock of work-in progress in the total of direct material, labour and factory overheads and deducting from this the closing work-in-progress. Depreciation is excluded being a non-cash item.

(b) Sometimes the Conversion Period is also known as the Production Cycle Period. In case, information about this period is given, then conversion period is not to be calculated with the above formula.

$$\text{Finished Goods Storage Period (F)} = \frac{\text{Average Stock of Finished Goods}}{\text{Daily Average Cost of Goods Sold}}$$

OR

$$\frac{(\text{Opening Stock} + \text{Closing Stock})/2}{\text{Total Cost of Goods Sold}/365}$$

Cost of Goods Sold is calculated by adding excise duty with the factory cost after adjusting opening and closing stock of finished goods. Administration/selling and distribution expenses are not considered in it, because, in financial accounting, stock of finished goods is valued at production or factory cost.

$$\text{Debtors Collection Period (D)} = \frac{\text{Average Debtors}}{\text{Credit Sales Per Day}}$$

OR

$$\frac{(\text{Opening Drs.} + \text{Closing Drs.})/2}{\text{Total Credit Sales}/365}$$

$$\text{Creditors Payment Period (C)} = \frac{\text{Average Creditors}}{\text{Total Credit Purchases}/365}$$

OR

$$= \frac{(\text{Opening Crs.} + \text{Closing Crs.})/2}{\text{Total Credit Purchases}/365}$$

Notes: In respect of the above formula the following points are worth noting

- The 'Average' value in the numerator stands for the average of opening balance and closing balance of the respective items. However, if only the closing balance is available, then even the closing balance may be taken as 'Average'.
- The figure '365' represents number of days in a year. However, there is no hard and fast rule and sometimes even 360 days are considered.
- In the calculation of M, W, F, D and C, the denominator is calculated at cost basis and the profit margin is excluded. The reason being that there is no investment of funds in profits.
- In the absence of any information, total purchases and total sales be treated as credit.

3. **Number of Operating Cycles:** The number of operating cycles in a period are determined by dividing the number of days in a year i.e.365 by the length of net operating cycle. Expressed as formula-

$$\text{No. of Operating Cycles} = \frac{365}{\text{Operating Cycle Period}}$$

4. **Amount of Working Capital:** Once the operating expenses and the number of operating cycles have been determined, the amount of actual working capital required is calculated by dividing the total operating expenses for the period by the number of operating cycles in that period.
For example, if the total operating expenses for the year amounts to Rs. 45,000 and the number of operating cycles in a year are assumed to be 3, the amount of working capital would be Rs.15,000 (Rs.45000/3).

Alternatively, the working capital may be calculated by using the following formula:

$$WC = C + \frac{OC}{N} \times CS$$

where WC = Working Capital
C = Cash Balance Required
OC = Operating Cycle Period
CS = Estimated Cost of Goods sold
N = Number of days in year

5. **Provision for Contingencies**: After ascertaining the amount of working capital as above, a certain amount say 5% or 10% may be added to cover contingencies. It is to be noted that facts based on estimates may not be cent percent accurate. Therefore, this provision is made to cover probable error in these calculations.

Example 4.1: Himalaya Ltd.'s Profit and Loss Account for the year ended 31st December 2005 is given below. You are required to calculate the working capital requirements under operating cycle method.

Trading and Profit & Loss Account
For the year ended 31st December, 2005

Particulars	Rs.	Particulars	Rs.
To Opening stock:		By Sales (Credit)	1,00,000
Raw Materials	10,000	By Closing stock:	
Work-in-Progress	30,000	Raw Materials	11,000
Finished Goods	5,000	Work-in-progress	30,500
To Purchases (Credit)	35,000	Finished Goods	8,500
To Wages & Mfg. Expenses	15,000		
To Gross Profit c/d	1,50,000		1,50,000
			55,000
To Administrative Exp.	15,000	By Gross Profit b/d	
To Selling and Dist.Exp.	10,000		
To Net Profit	30,000		
		Total	
Total	**55,000**		**55,000**

Opening and closing debtors were Rs. 6,500 and 30,500 respectively, whereas opening and closing creditors were Rs 5,000 and Rs. 10,000 respectively.

Solution: Computation of Operating Cycle

1. Raw Material Storage Period:

$$= \frac{\text{Average Stock of Raw Material}}{\text{Daily Average Consumption}}$$

$$= \frac{(\text{Rs.}10{,}000 + 11{,}000)/2}{\text{Rs.}34{,}000/365}$$

$$= \frac{\text{Rs.}10{,}500}{\text{Rs.}93.15} = 113 \text{ days}$$

Raw Material Consumed = Opening Stock +Purchases – Closing Stock
= Rs.10, 000+35,000-11,000
= Rs.34, 000

2. Conversion or Processing Period

$$= \frac{\text{Average Stock of work} - \text{in} - \text{Progress}}{\text{Daily Average Production Cost}}$$

$$= \frac{(\text{Rs.}30{,}000 + 30{,}500)/2}{\text{Rs.}48{,}500/365}$$

$$= \frac{\text{Rs.}30{,}250}{132.88}$$

Production Cost:	Rs.
Opening Work-Progress	30,000
Add: Material Consumed (as Above)	34,000
Add: Wages and Mfg. Expenses	15,000
	79,000
Less: Closing Work-in Progress	30,500
	48,500

3. Finished Goods Storage Period

$$= \frac{\text{Average Stock of Finished Goods}}{\text{Daily Average Cost of Goods Sold}}$$

$$= \frac{(\text{Rs.}5{,}000 + 8{,}500)/2}{\text{Rs.}45{,}000/365}$$

$$= \frac{\text{Rs.}6{,}750}{\text{Rs.}123.29} = 55 \text{ days}$$

Cost of goods sold:	Rs.
Opening Stock of Finished Goods	5,000
Add: Production Cost (As above)	48,500
	53,500
Less: Closing Stock of Finished Goods	8,500
	45,000

4. Debtors Collection Period

$$= \frac{\text{Average Debtors}}{\text{Daily Average Sales}}$$

$$= \frac{(\text{Rs.}6{,}500 + 30{,}500)/2}{\text{Rs.}1{,}00{,}000/365}$$

$$= \frac{\text{Rs.}18{,}500}{\text{Rs.}273.97} = 67 \text{ days}$$

5. Creditors Payment Period

$$= \frac{\text{Average Creditors}}{\text{Daily Average Purchases}}$$

$$= \frac{(\text{Rs.}5{,}000 + 10{,}000)/2}{\text{Rs.}35{,}000/365}$$

$$= \frac{\text{Rs.}7{,}500}{\text{Rs.}95.89} = 78 \text{ days}$$

6. Net Operating Cycle Period:

OC = M + W + F + D – C
= 113+228+55+67-78
= 385 Days

Computation of Working Capital Requirement

1. Number of Operating Cycle Per Year $= \frac{365}{\text{Net Operating Cycle Period}}$

$$= \frac{365}{385} = 0.948$$

2.

Total Operating Expenses:	**Rs**
Total cost of Production (as per 3)	45,000
Add: Administrative Expenses	15,000
Add: Selling And Distribution Expenses	10,000
	70,000

3. Working Capital Required $= \dfrac{\text{Total Operating Expenses}}{\text{No. of Operating Cycles in a year}}$

$$= \frac{\text{Rs. } 70,000}{0.948} = \text{Rs. } 73,839$$

Alternatively, $WC = C + \dfrac{OC}{N} \times CS$

where WC = Working Capital

C = Cash Balance Required

OC = Operating Cycle Period

CS = Estimated Cost of Goods Sold

N = Number of days in a year

$$WC = O + \frac{385}{365} \times \text{Rs. } 70,000$$

= Rs. 73,835

Note: The difference is due to approximation in the number of operating cycle:

☞ Check Your Progress 1

1) From the following information taken from SNS Company; calculate the working capital required using the operating cycle method.

   (1) Annual sales are estimated at 1,00,000 units @ 20 per unit.

   (2) Production and sales quantities coincide and will be carried on evenly throughout the year and production cost is: Material Rs. 10; Labour Rs.4; Overheads Rs. 4 per unit.

   (3) Customers are given 60 days credit and 40 days credit is taken from suppliers.

   (4) 30 days of supply of raw material and 15 days supply of finished goods are kept in stock.

   (5) The production cycle is 30 days and all materials are issued at the commencement of each production cycle.

   (6) A cash balance equal to one-third of the other average working capital is kept for contingencies.

2) From the following information, extracted from the books of a manufacturing company, compute the operating cycle period and working capital required:

Period Covered: 365 days

Average Period Allowed by Supplier: 16 days	**Rs.**
Average total of debtors outstanding	48,000
Raw Material Consumption	4,40,000
Total Production Cost	10,00,000
Total Cost of sales	10,50,000
Sales for the year	16,00,000
Value of Average Stock Maintained:	
Raw Material	32,000
Work-Progress	35,000
Finished goods	26,000

b) **Net Current Assets Forecasting Method**

This is the most practical method of estimating working capital requirements. Under this method, the finance manager prepares a working capital forecast. In preparing this forecast, first of all, an estimate of all the current assets is made on a monthly basis. Thus, estimate of stock of raw materials, amount of raw material that will remain in process, stock of finished goods and outstanding amount from debtors and other receipts will have to be made. This should be followed by an estimate of current liabilities comprising outstanding payments for material, wages, rent, and administrative and other expenses. The difference between the forecasted amount of current assets and current liabilities gives the networking capital requirements of the firm.

To this amount, a flat percentage would be added by way of provision for contingencies. The resulting figure will be the amount of total estimated working capital required. From this, bank finance is to be subtracted, if available. The remaining balance will be the amount of working capital that is to be managed by the firm. The method of forecasting working capital needs is 'cash' technique as all transactions are shown on cash cost basis.

Statement showing working Capital Requirements

(A)	**Current**	**Amount**	**Rs.**
(i)	Stock of Raw Material (for …month consumption)	….	
(ii)	(a) Work-in-Process (for months)	….	
	(b) Direct Labour	….	
	(c) Overheads	….	
(iii)	Stock of finished Goods (for …month's sales)		
	(a) Raw Material		
	(b) (b) Labour		
	(c) Overheads		
(iv)	Sundry Debtors or Receivables (for …month's sales)		
	(a) Raw Material		
	(b) Labour		
	(c) Overheads		

(v)	Payment in Advance (if any)		
(vi)	Balance of Cash (required to meet day-to-day expenses)		

(B)	**Current Liabilities**	
	(i) Creditors (for month's purchase of Raw Materials)	----------
	(ii) Lag in Payment of Expanses	
	(Outstanding expenses …month's)	----------
	(iii) Others (if any)	
	Net Working Capital (A) – (B)	----------
	Add: Provision for Contingencies	
	Total Working Capital Required	

Example 4.2: Prepare an estimate of working capital requirements from the following information of a trading concern:

(a)	Projected Annual Sales	1,00,000
(b)	Selling Price	Rs.8 per unit
(c)	Profit Margin on Sales	25%
(d)	Average Credit Period Allowed to Customers	8 weeks
(e)	Average Credit Period Allowed by Suppliers	4 weeks
(f)	Average Stock Holding in terms of Sales Requirement	12 weeks
(g)	Allow 10% for Contingencies	

Solution:

Statement Showing working Capital Requirements

(a)	**Current Assets**	**Rs.**
	Stock (12 Weeks)	1,38,462
	(Rs.6,00,000 × 12/52)	92,308
	Debtors (8 weeks)	2,30,770
	Rs. 6,00,000 × 8/52)	
Less:	**Current Liabilities**	46,154
	Creditors (4 weeks)	
	(6,00,000 × 4/52)	
	Net Working Capital (A–B)	1,84,616
Add:	10% for Contingencies	18,462
	Total Working Capital Required	

Working Notes

(i) Cost of Goods Sold

Sales = Rs. 1,00,000 × 8 = Rs. 8,00,000

Profits = Rs. 8,00,000 × 25% = Rs. 2,00,000

Cost of Sales = Rs. 8,00,000–2,00,000= Rs. 6,00,000

(ii) As, it is a trading concern; hence cost of sales is treated as purchases.

(iii) Profits have been ignored because profits may or may not be used as source of working capital.

Example 4.3: On 1st January, 2005 the Board of Directors of Paushak Limited wanted to know the amount of working capital required to meet the programme they have planned for the year. From the following information, prepare an estimate of working capital requirements.

Issued Share Capital	Rs. 2,00,000
8% Debentures	Rs. 50,000
Fixed Assets as on 1st January	Rs. 1,25,000

Production during the previous year was 60,000 units and it is proposed to maintain the same during 2005. The expected ratio of cost to selling price are:
Raw Materials 60%; direct wages 10% Overheads 20%.

The following further information is available:

a) Raw materials are expected to remain in the stores on an average for two months before being issued to the production unit.
b) Each unit of production is expected to be in process for one month.
c) Finished goods will stay in the warehouse awaiting dispatch to customers for approximately three months.
d) Credit allowed by creditors is two months from the date of delivery of raw materials.
e) Credit given to debtors is three months from the date of dispatch.
f) Selling price is Rs 5 per unit.

Solution:

Statement Showing working Capital Requirements

(a)	Current Assets	Rs.	Rs.
(i)	Stock of raw material (2 months) (Rs.15,000×2)		30,000
(ii)	Work-in-Progress (1 month) Material (Rs.15,000×1) Labour (Rs.2,500×1) Overheads (Rs.5,000×1)	 15,000 2,500 5000	 22,500
(iii)	Stock of finished Goods (3 months) Material (Rs.15,000×3) Labour (Rs.2,500×3) Overheads (Rs.5,000×3)	 45,000 7,500 15,000	 67,000
(iv)	Debtors (3 months) Material (Rs. 15,000×3) Labour (Rs. 2,500×3) Overheads (Rs. 5,000×3)	 45,000 7,500 15,000	 67,000 1,87,500
(B)	**Current Liabilities:** Creditors for raw Material (2 months) Rs. 15,000×2) Net working Capital required (A–B)		 30,000 **1,57,500**

Working Notes:

1) Debtors have been valued and calculated on sales basis which would be Rs. 75,000 ($60,000 \times 5 \times 3 \times 12$). Hence, working capital taking Current Assets at total value

		Rs.
Working Capital required as per above statement	1,57,500	
Add: Increase in Debtors (Rs. 75,000–Rs.67, 500)		7,500
		1,65,000

2) Monthly amount of each element of cost is calculated as follows-
Total sales $60,000 \times 5$ = Rs. 3,00,000

(a) Raw Materials = $\frac{3,00,000 \times 60}{100 \times 12} = \text{Rs.}15,000$

(b) Direct Labour = $\frac{3,00,000 \times 10}{100 \times 12} = \text{Rs.}2,500$

(c) Overheads = $\frac{3,00,000 \times 20}{100 \times 12} = \text{Rs.}5,000$

3) It is assumed that labour and overhead in the beginning. Hence, full amount of labour and overhead is included in work-in-progress. If it is assumed that labour and overheads accrued evenly, half of the amount will be included in work-in-progress.

4) Additional capital required will be Rs. 35,500 (Rs. 1,57,500-1,25,000), because Rs. 1,25,000 is available from long-term sources (share capital debentures-Fixed assets)

☞ Check Your Progress 2

1) You are required to prepare for the Board of Directors of Suman Ltd. a statement showing the working capital needed to finance a level of activity of 5,200 units of output. You are given the following information:

Elements of Cost	**Amount per unit (Rs.)**
Raw Material	8
Direct Labour	2
Overheads	6
Total Cost	16
Profit	4
Selling Price	20

(i) Raw Materials are in stock, on an average one month, (ii) Materials are in process, on an average half a month, (iii) Finished Goods are in stock on an average 6 weeks, (iv) Credit allowed to Debtors is two months, (v) Lag in payment of wages is $1^{1/2}$ weeks, (vi) Assume 52 weeks in a year and 4 weeks in a month.

Cash in hand and at Bank is expected to be Rs. 7,300. You are informed that production is carried on evenly during the year and wages and overheads accrue evenly.

2) From the following information, you are required to estimate the net working capital:

	Cost Per unit (Rs.)
Raw Material	200
Direct Labour	100
Overhead (excluding Depreciation)	250
Total Cost	550

Estimated data for the forthcoming period are given below:

Raw Material in Stock	Average 6 weeks
Work-in-progress (assume 50% completion stage with full material consumption)	Average 2 weeks
Finished Goods in Stock	Average 4 weeks
Credit Allowed by Suppliers	Average 4 weeks
Credit Allowed to Debtors	Average 6 weeks
Cash at Bank Expected to be	Rs.75,000
Selling Price	Rs. 800 per unit
Output	52,000 units per annum.

Assume that production is sustained at an even pace during 52 weeks of the year. All sales are on credit basis.

c) **Projected Balance Sheet Method**

Under this method, estimates, of different assets (excluding cash) and liabilities are made taking into consideration the transactions in the ensuring period. Thereafter, a balance sheet is prepared based on these forecasts. Assets and liabilities are called 'Projected balance sheet'. The difference between assets and liabilities of this balance sheet is treated as shortage or surplus cash of that period. If the total liability is more than total assets, it represents excess cash, which is not required by the firm. The management may plan for its investment. On the contrary, if total assets are more than total liabilities, then it indicates the deficiency of working capital, which is to be arranged by the management either from bank overdraft or from other sources.

d) **Adjusted Profit and Loss Method**

In this method, estimated profit is calculated based on transactions of the ensuing period. Thereafter, increase or decrease in working capital is computed adjusting the estimated profit by cash inflows and cash outflows. It is like cash flow statement. A few banks in India use forms for computing working capital under this method. A specimen of such a form is given below.

Computation of Working Capital

	Rs.
Net Income	……..
Add: (i) Non-cash Items	……
Working Capital Provided Operations	… … … …
Add: (ii) Cash inflow Items	……..
Less: Cash Outflow items	.
Net Changes in Working Capital	……..

e) **Cash Forecasting Method**

In this method, estimate is made of cash receipts and payments in the ensuring period. The difference of these receipts and payments indicates deficiency or surplus of cash. The management formulates plans to procure the amount of deficit. This method, in a way, is a form of cash budget.

Example 4.4: Calculate the operating cycle and the working capital requirements from the following figures:

	Balance as at 1st January	Balance as at 31st December
	Rs.	Rs.
Raw Material	80,000	1,20,000
Work-in-Progress	20,000	60,000
Finished goods	60,000	20,000
Sundry Debtors	40,000	40,000
Wages and Manufacturing Expenses	-	2,00,000
Distribution and Other Expenses	-	40,000
Purchases of Materials	-	4,00,000
Total Sales	-	10,00,000

(i) The Company obtains a credit for 60 days from its suppliers.
(ii) All goods were sold for credit.

Solution:

Computation of Operating Cycle

(i) Material Storage Period:

$$= \frac{\text{Average Stock of Raw Materials}}{\text{Daily Average Consumption}}$$

$$= \frac{(Rs.80,000 + 1,20,000)/2}{Rs.3,60,000/365}$$

$$= \frac{(Rs.1,00,000)}{Rs.986.3} = 101.38\,\text{days}$$

Material Consumed = Opening Stock + Purchases – Closing Stock

= Rs. 80,000 + 4,00,000-1,20,000
= Rs. 3,60,000

(ii) Conversion or Processing Period

$$\frac{\text{Average Stock of Work – in – progress}}{\text{Daily Average Factory Cost}}$$

$$= \frac{(Rs.20,000 + 60,000)/2}{Rs.5,20,000/365}$$

$$= \frac{(Rs.40,000)}{Rs.1,424.65} = 28.07\,\text{days}$$

Factory Cost: **Rs.**

Opening Work-Progress	20,000
Material Consumed (as above)	3,60,000
Wages and Mfg. Expenses	2,00,000
	5,80,000
Less: Closing Work-in-Progress	60,000
	5,20,000

(iii) Finished Goods Storage Period

$$\frac{\text{Average Stock of Finished Good}}{\text{Daily Average Cost of Goods Sold}}$$

$$= \frac{(\text{Rs.}60,000 + 20,000)/2}{\text{Rs.}5,60,000/365}$$

$$= \frac{(\text{Rs.}40,000)}{\text{Rs.}1,534.25} = 26.07\text{days}$$

Cost of Goods sold **Rs.**

Opening Stock of Finished Goods	60,000
Factory Cost (as above)	5,20,200
	5,80,000
Less: Closing Stock of Finished Goods	20,000
	5,60,000

(iii) Debtors Collection period

$$= \frac{\text{Average Debtors}}{\text{Daily Average Sales}}$$

$$= \frac{(\text{Rs.}40,000 + 40,000)/2}{\text{Rs.}10,00,000/365}$$

$$= \frac{(\text{Rs.}40,000)}{\text{Rs.}2,739.7} = 14.6\,\text{days}$$

Computation of Working Capital Required

1. Operating Cycle Period = M+W+F+D-C
   = 101.38 +28.07+26.07+14.60-60
   = 110.12 or 110 days

2. Total Cost of Sales Rs

Cost of Goods Sold	5,60,000
Distribution and other Expenses	40,000
	6,00,000

3. Cash Working Capital $= C + \frac{OC}{N} \times CS$

$$= O + \frac{110}{365} \times \text{Rs.}6,00,000 = \text{Rs.}1,80,822$$

Example 4.5: Mr. Krishan wishes to commence a new trading business and gives the following information:

The total estimated sales in a year will be Rs. 12,00,000.

His expenses are estimated as fixed expenses of Rs. 2,000 per month plus variable expenses equal to five percent of this turnover.

He expects to fix a sale price for each product which will be 25 percent in excess of his cost of purchase.

He expects to turnover his stock four times in a year.

The sales and purchases will be evenly spread throughout the year. All sales will be for cash and purchases on credit, but he expects one month's credit for purchases.

He keeps cash in hand to meet one month's expenses.

Calculate: (a) His estimated profit for the year;
(b) His average working capital requirements.

Solution:

(a)

Estimated Profit of Mr. Krishan for the year

		Rs.
Sales		12,00,000
Less: Gross Profit $\left(12,00,000 \times \frac{25}{125}\right)$		2,40,000
Cost of Goods Sold		9,60,000
Gross Profit (as above)		2,40,000
Less: Expenses:		
Fixed (2000×12)	24,000	
		84,000
Variable $\left(12,00,000 \times \frac{5}{100}\right)$	60,000	1,56,000

(b) **Statement of Average Working Capital Requirements**

		Rs.
(A) Current Assets:		
(i) Stock		2,40,000
(ii) Turnover of Stock is 4 times		
(iii) Stock Turnover = $\frac{\text{Cost of Goods Sold}}{\text{Average stock at cost}}$		
Or $4 = \frac{\text{Rs.}9,60,000}{\text{Average Stock}}$		
So Average Stock = $\frac{\text{Rs.}9,60,000}{4} = \text{Rs.}2,40,000$		
(i) Cash		
To meet fixed expenses	2,000	
To meet variable expenses	5,000	7,000
$\left(12,00,000 \times \frac{5}{100} \times \frac{1}{12}\right)$		Nil
		2,47,000
(ii) Debtors (as all the sales are for cash only)		1,00,000
(B) Current Liabilities		
(i) Creditors [1 month/ (12,00,000x1/12)]		1,47,000
(ii) Working Capital Required (A-B)		

Total Purchases = Cost of Goods Sold + Closing Stock

(As it is a new business, there is no opening stock)

= Rs. 9,60,000 + 2,40,000 = Rs. 12,00,000.

Example 4.6: Manekchand Ltd. Plans to sell 30,000 units next year. The expected cost of goods sold is as follows:

	Rs. (Per units)
Raw Material	100
Manufacturing Expenses	30
Selling Administration And Finance Expanses	20
Selling Price	200

The duration of various stages of the operating cycle is expected to be as follows:

Raw Material Stage	2 month
Work in Progress	1 month
Fished Goods Stage	½ month
Debtors Stage	1 months

Assuming the monthly sales level of 2,500 units; estimate the gross working capital requirements if the desired cash balance is 5 % of the gross working capital requirement.

Solution:

Statement of Gross Working Capital Requirements

Current Assets:		**Rs.**	**Rs.**
(i)	Raw Material (2 months) (Rs. 2,500×100×2)	`	5,00,000
(ii)	Work in progress (1 month)		
	Raw material (Rs. 2,500×100×1)	2,50,000	
	Mfg. Expenses (Rs. 2,500×30×1)	75,500	3,25,000
(iii)	Finished good (1/2 months)		
	Raw Material (Rs. 2,500×100×5)	1,25,000	
	Mfg. Expenses (Rs. 2,500×30×.5)	37,500	1,62,500
(iv)	Debtors (1 month) (Rs. 2,500×150×1)		3,50,000
(v)	Cash		13,62,500
			71,711
	(5% of gross working capital i.e., 13,62,500×5/95)		14,34,211
	Gross Working Capital Required		

Working Notes:

1. Selling administration and finance expenses are not included in the value of closing stock of finished goods but added in the cost of sales for valuing debtors.

2. It is assumed that degree of completion of work-in-progress is 100% as regards materials, labour and overhead and as such material and manufacturing expenses for the full period are included in the cost of work-in-progress.
3. It is assumed that all sales are credit sales.
4. Profit has not been treated as source of working capital hence fully ignored.

☞ **Check Your Progress 3**

1) From the following particulars, calculate working capital adding 10% per annum for contingencies.

(a)	Average amount backed up for stocks: Stock of finished products Stock of materials and stores		 1,000 1,600
(b)	Average credit given: Home market 6 weeks credit Foreign market 1.5 week's credit		 62,400 15,600
(c)	Payment in Advance: Sales promotion expenses (Paid quarterly in advance)		 1,600
(d)	Lag in payment of wages and other expenses: Wages Materials and Stores Office Salaries Rent Other expenses	 1.5 weeks 1.5 months 0.5 months 6 months 1.5 months	 52,000 9,6000 12,480 2,000 9,600

2) M/s. ABC Limited have approached their bankers for their working capital requirements, who have agreed to sanction the same by retaining the margin as under.

Raw Material	20%	Finished Goods	25%
Stock-in-process	30%	Debtors	10%

From the following projections for 2004-2005, you are required to work out:

(i) The working capital required by the company and

(ii) The working capital limits likely to be approved by bankers Estimates for 2004-2005.

Annual Sales:	Rs.
Cost Production (including depreciation of Rs. 1,20,000	14,40,000
Raw Material Purchases	12,00,000
Monthly Expenditures	7,05,000
Anticipated Opening Stock of Raw Materials	25,000
Anticipated Closing Stock of Raw Materials	1,40,000
Inventory norms:	
Raw Materials	2 months
Work in progress	15 days
Finished Goods	1 months

The company enjoys a credit of 15 days on its purchase and allows one-month credit to its debtors. On sales orders the company has received 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.10,000.

3) Bharat Company Ltd. sells goods in the home market only and earns a gross profit of 25 % on sales. For the year ending 31st Dec; 2005, the following figures are available.

	Rs.
Material used	1,12,500
Wages paid	90,000

Manufacturing expenses (including depreciation	1,35,000
Administrative expenses	30,000
Depreciation	15,000
Sales promotion expenses	15,000
Income Tax payable in four installments which falls in the next financial year	37,500
Sales	**4,50,000**

Other particulars are

1. Suppliers of materials provide two month's credit;
2. Wages are paid half month in arrear;
3. Manufacturing and administrative expenses are all cash expenses and are paid one month in arrear;
4. Sales promotion expenses are paid quarterly in advance;
5. Sales are made at one month's credit;
6. Company wishes to keep one month stock of raw materials and also of finished goods;
7. The Company believes in keeping Rs. 25,000 available with it including the overdraft limit of Rs. 12,500 not yet utilised by the Company.

You are required to ascertain the requirements of working capital for the year 2005.

4) A Performa cost sheet of a Company provides the following particulars:

Element of Cost	**Amount per unit Rs.**
Raw Materials	80
Direct Labour	30
Overhead	60
Total Cost	170
Profit	30
Selling Price	200

The following further particulars are available:

Raw materials are on stock for one month on an average. Materials are in process of half month on an average. Finished goods are in stock for one month on an average. Credit allowed by suppliers is one month. Credit allowed to debtors is two months. Lag in payment of wages is 2 weeks. Lag in payment of overhead expenses is one month. 25% of output is sold for cash. Cash in hand and at bank is expected to be Rs. 30,000.

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. Wages and overhead accrue similarly and a time period of 4 weeks and 52 weeks is equivalent to a month and a year respectively.

4.8 SUMMARY

Financial decisions are based on certain considerations the main being the cash flows, cost and liquidity. Short-term financial decisions or working capital decisions are

different with regard to quantum and frequency of cash flows. There are two concepts of working capital:

(i) Gross Working Capital

(ii) Net Working Capital.

The main characteristic of the current asset is that they change their form within one operating cycle. Working capital requirement is influenced by a variety of factors, the main among them is nature and size of business. There are various methods of calculating working capital requirement. In some the base figures are obtained from financial statements.

4.9 SELF-ASSESSMENT QUESTIONS/EXERCISES

1. Explain the concept of working capital. Are gross and net concepts of working capital exclusive? Discuss.
2. What is the importance of working capital for a manufacturing firm? What will be the repercussions if a firm has (a) paucity of working capital (b) excess working capital?
3. What is the concept of working capital cycle? What is meant by cash conversion cycle? Why are these concepts important in working capital management? Give an example to illustrate your point.
4. Briefly explain factors that determine the working capital needs of a firm.
5. How is working capital affected by (a) Sales, (b) Technology and Production Policy, and (c) Inflation? Explain.
6. Define working capital management. Why is it important to study the management of working capital as a separate area in financial management?
7. Do you recommend that a firm should finance its current assets entirely with short term financing? Explain your answer.
8. What methods do you suggest for estimating working capital needs? Illustrate your answer.
9. Explain the difference between Gross and Net Working Capital.
10. What is the operating cycle concept of working capital?
11. State the difference between fixed and variable working capital.
12. How is working capital affected by the nature of business?
13. Why is excess working capital dangerous?
14. Explain the concept of working capital. What are the constituents of working capital of a company?
15. What is operating cycle concepts or working capital? How will you determine the amount of working capital under this method? Explain with examples?
16. "Inadequate working capital is disastrous whereas redundant working capital is a criminal waste". Critically examine this statement.
17. What is the concept of "Working Capital"? What factors determine the needs of working capital and how is it measured?

18. What is meant by working capital forecasting? Briefly explain the techniques used in making such forecasts.

19. Write short notes on the following:
    (i) Operating Cycle of Working Capital
    (ii) Types of Working Capital.

Practical Questions

1. The following data has been taken from the financial records of Meenakshi Company Ltd.

Raw Material	Rs. 40 per units
Direct Labour	Rs. 20 per unit
Overheads	Rs. 5,40,000 (Total)

The following additional information is also available:

1. The management of the company is planning to manufacture 1,00,000 units in the coming year. The selling price per unit will be Rs. 125. There is perfect harmony between output and sales of the Company, which is maintained throughout the year.
2. The average storage period is 40 days for raw material and 30 days for finished goods.
3. The company sells goods to its customer on 30 days credit and purchase raw material on 60 days credit from its suppliers.
4. The duration of the production cycle in the Company is 20 days and the needed raw material is issued to the production at the beginning of each production cycle.
5. 20% of the average working capital is kept as extra cash for contingencies.

Assume 360 working days in the operating period, work out an estimate of the total requirements of working capital for the Company using Operating Cycle Method.

2. From the following data, compute the duration of the operating cycle and working capital requirements for each of the two years:

Average Stocks:	Year 1 (Rs.)	Year 2 (Rs.)
Raw Material	20,000	27,000
Work-in-progress	14,000	18,000
Finished Goods	21,000	24,000
Purchase	96,000	1,35,000
Cost of Goods Sold	1,40,000	1,80,000
Sales	1,60,000	2,00,000
Debtors	32,000	50,000
Creditors	16,000	18,000

Assume 360 days per year for computational purposes.

Forecasting Net Current Assets Methods

3. From the following information, you are required to estimate the working capital requirements of Mahesh Ltd.

Raw Material Cost	0.75 per units
Overheads	Rs. 15,000 per annum
Labour	581/2 p. per unit

Output and Sales	10,000 units per month
Selling Price	Rs. 5.00 per unit
Buffer Stocks to be carried	
Raw Materials	2 weeks production
Finished Goods	3 weeks supply

The debtors on an average take 2.25 month's credit. Raw Material is received in uniform deliveries daily and suppliers have to be paid at the end of the month when goods are received. Other creditors for overheads allow on an average 1 ½ months credit. Calculate the working capital required for February in the form, for presentation to the Board. For this purpose, you may assume that a month is a four-week period.

4. The Board of Directors of ABC Engineering Company Ltd. requests you to prepare a statement showing the working capital requirements forecast for an expected level of production of 22,000 tonnes. The following information is available for your computation.

Raw Material to remain in stock on an average	4 weeks
Processing Material in process	2 weeks
Permanent Material in process	200 tonnes
Finished Goods in Stock	6 weeks
Credit allowed to Customers	8 weeks
Expected ratio of material to sale price	72%
Wages and Overheads	22%
Selling Price per ton	Rs. 3,000

5. Prepare a working capital forecast from the given below information:

Issued Share Capital	Rs. 4,00,000
6% Debentures	Rs. 1,50,000
Fixed Assets	Rs. 3,00,000

Production during the previous year is 1-lac units. The same level of activity is intended to be maintained during the year. The expected ratios of cost to selling prices are:

Raw materials 50% Direct Wages 10% Overheads 25%. The inventory holding norms are as under:

Raw Material	2 month's Consumption
Stock-in-process	2 month's cost of production
Finished Goods	4 month's cost of sales

Besides sundry Creditors and Sundry Debtors are equivalent to 3 month's purchases and 3 months sales respectively. Selling price is Rs. 6 per unit. Both production and sales are in regular cycle and wages and overhead accrue evenly.

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

Raw Material	90
Direct Labour	40

Overheads	75
	205
Profits	60
Selling Price	265

1) Raw Materials are in stock on an average for one month;
2) Materials are in process on an average two weeks;
3) Finished goods are in stock on an average one-month;
4) Credit allowed by suppliers one month;
5) Time lag in payment from debtors two months;
6) Lag in payment of wages is 1 ½ weeks; and
7) Lag in payment of overheads is one month

20% of the output is sold against cash. Cash in hand and at bank is expected to be Rs. 60,000. It is to be assumed that production is carried on evenly throughout the year, wages and overheads accrue similarly and time period of 4 weeks is equivalent to a month and 52 weeks a year.

7. The following data is available from the cost sheet of a Company.

	Cost per unit
Raw Material	50
Direct Labour	20
Overhead (including depreciation of Rs. 10)	40
Total Cost	110
Profit	20
Selling Price	130

Additional information:

Average raw material in stock is for one month. Average material in progress is for half month. Credit allowed by suppliers is one month, credit allowed to debtors is one month. Average time lag in payment of wages: 10 days; average time lag in payment of overheads 30 days. 25% of the sales are on cash basis. Cash balance expected to be Rs. 1,00,000. Finished goods lie in the warehouse for one month.

You are required to prepare a statement showing the working capital needed to finance a level of the activity of 50,000 units of output. Production is carried out evenly throughout the year and wages and overheads accrue similarly. State your assumptions if any, clearly.

4.10 SOLUTIONS / ANSWERS

Check Your Progress 1

Solution 1

Computation of Operating Cycle

1.	**Operating Period**		**Days**
	(i) Raw Material Storage Period		30
	(ii) Finished Stock Storage Period		15
	(iii) Processing or Conversion Period		30
	(iv) Debtors Collection Period		60
			135
Less:	Creditors Payment Period		40
			95
2.	Number of Operating Cycle per year	365/95 =	3.842
3.	Total Operating Expenses		Rs.
	Raw Material (1,00,000 × 10)		10,00,000

Labour (1,00,000 × 4)	4,00,000	
Overheads (1,00,000 × 4)	4,00,000	

4. Working Capital = $\frac{\text{Total Operating Expenses}}{\text{No. of Operating Cycles}}$

$= \frac{\text{Rs.}18,00,000}{3.842 \text{ or } 365/95}$

Add: 1/3 for Contingencies	4,68,493
	1,56,164
Total Working Capital Required	6,24,657

Alternatively

$$WC = C + \frac{OC}{N} \times CS$$

$$= 0 + \frac{95}{365} \times 18,00,000 = 4,68,493$$

Add: 1/3 for Contingencies = 1,56,164

6,24,657

Solution 2:

Computation of Operating Cycle Period

1. Material Storage Period

$$= \frac{\text{Average Stock of Raw Material}}{\text{Daily Average Consumption}}$$

$$= \frac{\text{Rs.}32,000}{\text{Rs.}4,40,000/365} = \frac{32,000}{1,205.48} = 27 \text{ days}$$

2. Conversion Period

$$\frac{\text{Average Stock of work} - \text{in} - \text{progress}}{\text{Daily Average Production Cost}}$$

$$\frac{\text{Rs.}35,000}{\text{Rs.}10,00,000/365} = \frac{35,000}{2,739.73} = 13 \text{ days}$$

3. Finished Goods Storage Period

$$\frac{\text{Average Stock of Finished Goods}}{\text{Daily Average Cost of Sales}}$$

$$\frac{\text{Rs.}26,000}{\text{Rs.}10,50,000/365} = \frac{26,000}{2,876.7} = 9 \text{ days}$$

4. Debtors Collection Period:

$$= \frac{\text{Average Debtors}}{\text{Sales per day}}$$

$$= \frac{\text{Rs.}48,,000}{\text{Rs.}16,00,000/365} = \frac{48,000}{4,383.56} = 11 \text{ days}$$

1.	Operating Cycle Period	Days
	(i) Material Storage Period	27
	(ii) Conversion Period	13
	(iii) Finished Goods Storage Period	9
	(iv) Debtors Collection Period	11/60
	Less: Creditors Payment Period	16/44

2. Number of Operating Cycle Per year 365/44 8.3

3. Total Operating Expenses Rs. 10,50,000

4. Working Capital Required $= \frac{\text{Total Operating Expenses}}{\text{No. of Operating Cycles in a Year}}$

$= \frac{\text{Rs.}10,50,000}{\text{Rs.}8.3}$

= Rs. 1,26,506

Alternatively

$$WC = C + \frac{OC}{N} \times CS$$

$$= 0 + \frac{44}{365} \times \text{Rs.}10,50,000$$

$$= \text{Rs.}1,26,575$$

Note: A little difference between the two methods is due to approximation.

Check Your Progress 2

Solution 1:

Statement Showing Working Capital Requirements

(A)	Current Assets:	Rs.	Rs.
	(i) Stock of Raw Materials (4 weeks):		3,200
	(ii) Work in process (2 weeks):		
	Raw Materials (Rs.800 × 2)	1,600	
	Labour (Rs. 200 × 1)	200	
	Overheads (Rs.600 × 1)	600	2,400
	(iii) Stock of finished Goods (6 weeks):		
	Raw Materials (Rs.800 × 6)	4,800	
	Labour (Rs 200 × 6)	1,200	
	Overheads (Rs.600 × 6)	3,600	
			9,600
	(iv) Debtors (8weeks):		
	Raw Materials (Rs.800 × 8)	6,400	
	Labour (Rs.200 × 8)	1,600	12,800
	Overheads (Rs.600 × 8)	4,800	7,300
	(v) Cash as per estimate		35,300
	(B) Less: Current Liabilities:		
	(i) Creditors (4 Weeks)	3,200	
	(ii) Lag in payment of wages ($1^{1/2}$ Weeks):		
	Labour (Rs.200 × $1^{1/2}$)	300	3,500
	Working Capital Required (A-B)		31,800

Working Notes:

(1) Weekly amount of each element of costs calculated as follows:
Total Sales for of the year = 5,200 × Rs.20 = Rs.1,04,000

(i) Raw Material $= \frac{1,04,000}{52 \times 20} = \text{Rs.}800$

(ii) Direct Labour = $\frac{1,04,000 \times 2}{52 \times 20} = \text{Rs.}200$

(iii) Overhead = $\frac{1,04,000 \times 6}{52 \times 20} = \text{Rs.}600$

Alternative Method

Annual Production = 5,200 units
Weekly production = 5,200/52 = 100 units
Material = 100 × Rs.8 = Rs.800
Labour = 100 × Rs.2 = Rs.200
Overhead = 100 × Rs.6 = Rs.600

(2) Debtors are calculated at cash cost of sales.

(3) It has been assumed that material is issued at the commencement in each production cycle, but labour and overheads are incurred in the process of production. Therefore, half of the amount (one week) is invested in the process.

(4) Profit may be or may not be a source of working capital. Payment of Income Tax and Dividend are adjusted in these profits, therefore, profits have not been considered.

Solution 2

Computation of Net Working Capital

(A)	**Current Assets**	**Rs.**	**Rs.**
	(i) Stock of raw Materials (6 weeks)		
	(Rs. 52,000 × 200 × 6/52)		12,00,000
	(ii) Work-in-progress (2 weeks)		
	Raw Materials (Rs.52, 000 × 200 × 2/52)	4,00,000	
	Direct Labour (Rs.52,000 × 100 × 1/52)	1,00,000	
	Overheads (Rs.52, 000 × 250 × 1/52)	2,50,000	7,50,000
	(iii) Stock of Finished Goods (4 weeks)		
	(52,000 × 800 × 4/52)		22,00,000
	(iv) Debtors (6 weeks)		
	(52,000 × 800 × 6/52)		48,00,000
	(v) Cash at Bank		75,000
			90,25,000
(B)	Current Liabilities		
	(ii) Creditors (4 Weeks)		
	(iii) (52,000 × 400 × 4/52)		8,00,000
(c)	Net Working Capital (A-B)		82,25,000

Working Notes:

(i) Debtors are taken at selling price as the amount of net working capital is to be calculated. If working capital requirements are to be calculated, then debtors should be taken at cash cost.

(ii) It is assumed that there is no time lag in payment of overheads.

Check Your Progress 3

Solution 1

Computation of "Working Capital Requirements"

(A) Current Assets	**Rs.**	**Rs.**

(i) Stock of Material and Stores		
(ii) Stock of finished Goods		
(iii) Books Debts (a) Home (62,400×6/52)	7,200	
(b) Foreign (15,600×1.5/52)	450	
(iv) Advance Payment (1,600×3/12)		
(B) Current Liabilities		
(i) Creditors for Stores and Materials (9,600×1.5/12)		
(ii) Outstanding expenses:		
Wages (52,000×1.5/52)	1,500	
Office Salaries (12,480×.5/12)	520	
Rent (2,000×6/12)	1,000	
Other Expenses (9,600×1.5/12)	1,200	
© Net Working Capital (A-B)	5,420	
Add: 10% Contingency Allowance	5,230	
Average amount of working Capital required	523	
	5,753	

Working notes:

(i) For calculation purposes, 52 weeks or 12 months in a year are assumed.
(ii) In the absence of cash cost of current assets, the actual working capital will differ from that of amount computed above.

Solution 2

(i) Statement Showing Working Capital Requirements

(A) Current Assets	**Rs.**	**Rs.**
(i) Cash Balance		10,000
(ii) Stock of Raw Materials (2 months) (Rs. 7,20,000×2/12)		1,20,000
(iii) Stock of Work-in-progress (15 days) (Rs. 10,80,000×.5/12)		45,000
(iv) Stock of Finished Goods (1months) (Rs. 10,80,000×1/12)		90,000
(v) Debtors (1 month) (Rs. 10,80,000×1/12)		90,000
(vi) Monthly Expenditure		25,000
		3,80,000
(B) Current Liabilities		
(i) Creditors (15 days) (Rs. 7,05,000×.5/12)	29,375	
(ii) Advance received from Debtors	15,000	44,375
Net Working Capital Required (A) – (B)		3,35,625

(ii) **Working capital limits likely to be approved by bankers.**

	Particulars	**Required by Co. (Rs.)**	**Margin (Rs.)**	**Allowed by bankers (Rs)**
A.	Raw Materials	1,20,000	20% = 24,000	96,000
B.	Work-in-Progress	45,000	30% = 13,500	31,500

C.	Finished Goods	90,000	25% = 22,500	67,500
D.	Debtors	90,000	10% = 9,000	81,000
E.	Expenses	25,000		NIL
	Working Capital Likely to be approved by Bankers.			2,76,000

Working Notes:

Rs.

A	Calculation of raw material consumed:	
	Opening Stock of Raw Material	1,40,000
	Add: Purchases	7,05,000
		8,45,000
	Less: Closing Stock of Raw Material	1,25,000
	Annual Consumption	7,20,000
B	Cash cost of annual production	Rs.
	Cost of production as given	12,00,000
	Less: Depreciation	1,20,000
		10,80,000

(iii) It is assumed that there is neither opening stock of finished goods nor closing stock. Hence, cost of sales is taken to Rs. 10,80,000 after deducting depreciation.

Solution 3

A	**Current Assets**		Rs.
	(i)	Debtors (cash cost of goods sold i.e. (3,67,500×2/12)	30,625
	(ii)	Prepayments: Sales Promotion Expenses (15,000×3/12)	3,750
	(iii)	Stock of Raw Materials (Rs. 1,12,500×1/12)	9,375
	(iv)	Stock of finished good (Rs. 3,22.500×12)	26,875
	(V)	Cash in hand	25,000
		Total	**956,25**
B		**Current Liabilities**	
	(i)	Sundry Creditors (Rs. 1,12,500×2/12)	18,750
	(ii)	Outstanding Expenses:	
		(a) Wages (Rs. 90,000×5/12)	3,750
		(b) Mfg. Expenses (Rs. 1,20,000×1/12)	10,000
		(c) Administration Expenses (Rs. 30,000×1/12)	2,500
	(iii)	Bank Overdraft	12,500
		Total	**47,500**
C		Net Working capital Required (A-B)	**48,125**

Working Notes:

(i) **Cash Cost of Production and Total Cost is Calculated as under:**

	Rs.
Sales	4,50,000
Less: Gross Profit @ 25% on sales	1,12,500
	3,37,500
Less: Depreciation	15,000

Cash Production Cost	3,22,000
Add: Administration Expenses	30,000
Sales Promotion Expenses	15,000
Total Cash Cost	3,67,500
Or	
Material Consumed	1,12,500
Wages Paid	90,000
Cash Mfg. Expenses	1,20,000
Cash Production Cost	3,22,500
Add: Administration Expenses	30,000
Sales Promotion Expenses	15,000
Total Cash Cot	3,67,500

(ii) Debtors have been calculated at cash cost.

(iii) Income tax has been ignored because profits are not treated as source of working capital, while income tax is paid out of profits.

Solution 4

Computation of Working Capital Requirement

A		Current Assets:	Rs.
	(i)	Stock of Materials (1 months) (1,04,000 × 80 × 4/52)	6,40,000
	(ii)	Work-in-progress (1/2 months)	
		Materials Cost (1,04,000 × 80 × 2/52)	3,20,000
		Labour Cost (1,04,000 × 30 × 1/52)	60,000
		Overheads (1,04,000 × 60 × 1/52)	1,20,000
	(iii)	Finished Goods (1 months)	
		Material Cost (1,04,000 × 80 × 4/52)	6,40,000
		Labour Cost (1,04,000 × 30 × 4/52)	2,40,000
		Overheads (1,04,000 × 60 × 4/52)	4,80,000
	(iv)	Debtors (2 months)	20,40,000
		(78,000 × 70 × 8/52)	30,000
	(v)	Cash Balance	45,70,000
B		**Current Liabilities**	
	(i)	Creditors for Material (1 months) (1,04,000 × 80 × 4/52)	6,40,000
	(ii)	Outstanding Expenses	
		(a) Overheads (1 months) (1,04,000 × 60 × 4/52)	4,80,000
		(b) Wages (2 weeks) (1,04,000 × 30 × 2/52)	1,20,000
			12,40,000
C		**Estimated Requirements of Working Capital (A-B)**	33,30,000

Working Notes:

(ii) 25% of production i.e 26,000 units are sold for cash. Hence credit sales are 78,000 units. The cash cost of debtors is calculated on these units.

(iii) It is assumed that full material is issued in the beginning and labour and overhead accrue evenly. Therefore, their 50% (one week) amount is included in WIP.

(iv) Profit on cash as well as on credit sales may or may not be the source of working capital. Income tax and dividends paid are to be adjusted from these profits. Hence, profits are ignored.

(v) All the overheads are assumed to be variable. Working capital will be reduced by the amount of depreciation. In absence of these data, estimates cannot be accurate.

(vi) It is assumed that stock of raw material and finished goods is maintained on the basis of goods produced.