STUDY MATERIAL FOR B.COM

MANAGEMENT ACCOUNTING

SEMESTER – VI

KAMARAJ COLLEGE

ACADEMIC YEAR 2025-26

PREPARED BY

COMMERCE DEPARTMENT

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Management accounting

Unit - I

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UNIT - I

Management accounting

Accounting as a management tool is a modern notion of management accounting. According to the ICMA London, management accounting is "the presenting of accounting information in such a way as to aid management in the establishment of policy and the day-to-day operations of an organization."

Thus, management accounting refers to any accounting that assists management in conducting business more efficiently. Furthermore, management accounting is concerned with all accounting information beneficial for the management in carrying out its responsibilities. Controlling uses marginal costing, standard costing, budgeting, profit and loss breakpoint analysis, cost-quantity return, ratio analysis, company comparison, unified costing, and internal audit, are some of them. A cost accountant will use most of these strategies as well.

Management accounting delivers financial information to internal management, employees, managers, and executives of a business to inform decision-making and improve performance.

Management accounting is also a strategic partner. They work to secure future success by exploring methods that add value to their company's products or services. They accomplish this by utilizing numbers, data, and research to assist leadership in making informed decisions to avoid risk and maximize profit on behalf of the firm. Management accountants investigate and explain the "why" behind the numbers.

Management accounting differs from financial accounting because it focuses on how to notify internal decision-makers. Financial accounts collect data and generate reports for external government agencies and other stakeholders, with less emphasis on forecasting the future.

Scope of Management Accounting

Management accounting covers a wide range of areas, such as financial accounting, cost accounting, budgeting, and taxes. The primary goal is to assist management in performing its planning, directing, and managing tasks. The following are some of the areas of management accounting specialty. The scope of management accounting is vast and can be divided into several categories:

1. Cost Accounting
2. Financial Accounting
3. Budget and Forecast
4. Interpretation of Data
5. Financial Management
6. Management Reporting
7. Financial Statement Analysis

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8. Inflation Accounting

1. Cost Accounting

Cost accounting is a crucial accounting technique because it provides cost analysis tools for a business, such as marginal cost, operational cost, inventory costing, budget control, etc. These are required by business management to draft and outline the business needs.

Cost accounting assists in determining the total budget for any firm and gives several methods for estimating and calculating the entire cost of providing a service to the consumer. Cost accounting is also essential for business analysts and executives since each company's activity depends on the cost involved.

2. Financial Accounting

Financial accounting and cost-accounting are not the same things. As mentioned earlier, cost accounting involves calculating and analyzing the overall cost of a business process. Conversely, financial accounting calculates and analyses business transactions, including expenses, inventories, assets, and reporting. Financial statements are critical in financial accounting and are prepared regularly at the end of each fiscal year. Financial statements comprise the company's balance sheet and the overall profit or loss produced by the business or company in the current fiscal year. Financial accounting is critical for the organization's financial forecasts because it provides the general financial information incurred throughout the current fiscal year.

Financial accounting is also significant in that it assists management in operating successfully and implementing coordination across corporate processes to carry out business planning.

3. Budgeting and Forecasting

Budgeting and forecasting are also part of the management accounting scope, including budget control and business forecasting trends. Budget management systems are based on financial data and business performance. Budget control aids in identifying and analyzing the causes and weak points that slow down coordination and decrease business performance.

On the other hand, forecasting is an essential function of management accounting because it provides a business view from the stakeholders' perspective. Business budgeting and forecasting outline the company's goals and plans and the expected outcomes of the activities carried out to help prepare the company in case of an emergency.

4. Data Interpretation

Data interpretation is described as converting business data into facts and statistics that business management can easily understand. Interpreting your work is just as crucial to your business as financial reporting because it helps you avoid drawing erroneous conclusions from

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your business data. If the data is not appropriately comprehended and evaluated, it might spell doom for a market business.

The data for the current year is analyzed and compared to past data to better understand the business's growth.

5. Financial Administration

Financial management is the administration and planning of a company's financial resources. Raising cash and using them wisely is critical for sound financial management. The purpose of considering financial management as managerial accounting in terms of scale is to optimize a company's profits through the efficient use of cash. Finance was and continues to be the most crucial part of every organization, and a business cannot function without effective financial management.

6. Management Reporting/Reporting

Reporting is essential for each business manager. Obtaining reports on time is critical for managing corporate growth and resources. The timely report assists management in making successful decisions and keeps management informed of ongoing operations. Data and reports are presented to management in simple graphs, charts, and presentations. According to the company requirements, reports are retrieved weekly, monthly, quarterly, and yearly, and these reports are beneficial when examining corporate data.

7. Accounting for Inflation

Inflation analysis is critical in business and is described as a drastic change in financial results when market prices change. Inflation accounting refers to inflation analysis tools that aid in identifying the causes of inflation and eradicating them for improved performance.

8. Analysis of Financial Statements

As mentioned earlier in financial accounting, financial statements are prepared after each fiscal year to study and analyze the financial growth of a business. The financial accounts provide insights into the business and aid in its growth through their interpretations and conclusions.

Thus, it can state that extent of management accounting analyses business data and successfully interprets it for effective business planning and decision-making to maximize profit and fully utilize resources.

Importance of Management Accounting

- **Planning**

In management accounting, the financial information and non-financial information is presented at regular intervals say weekly, fortnightly to the management. This presentation includes forecasts, budgets, and in-depth analysis. Hence it assists the management in planning the business activities.

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- **Decision making**

Since management accounting presents various charts, forecasts, and analysis the management uses it for decision making.

- **Identify early signs of problems**

If a product is not performing well the management can identify it early on as the accounts are presented at regular intervals. This will aid in overcoming the constraints early on and avoiding future losses.

- **Strategic management**

Based on the information presented in management accounting, the management can make decisions about continuing a product or modifying the sale strategy. Since management accounting is not regulated by any law, the management can decide the areas that require more analysis, investigation and accordingly draw up strategies.

Goals of Management Accounting in a Company/Organization

1) Making "Make or Buy" Decisions

A key choice an organization should frequently make is whether it's more practical to fabricate items in-house or get them from an outsider. The components used to settle on these choices incorporate generation accessibility and expenses. The board bookkeeping creates bits of knowledge that take into consideration choices made at key and operational dimensions. In a few circumstances, it's more financially savvy for organizations to fabricate parts for items in their own plants. In any case, in different circumstances, there is coordination that makes it progressively common sense to re-appropriate the work to different organizations.

2) Assessing the Rate of Return

At the point when an organization is beginning a venture that requires substantial speculations, it's vital for it to dissect the anticipated rate of return (ROR). On the off chance that an organization has 2+ venture chances, there are different issues to consider. They incorporate how long are expected to equal the initial investment on the undertaking, how to pick the most beneficial ventures, anticipated money streams, and so forth. The executives bookkeeping is a powerful apparatus to help answer these inquiries.

The ROR and degree of profitability (ROI) of specific ventures are critical to ascertain to decide if they're reasonable alternatives. Speculations can include extreme choices to make. That is the reason it's basic to do calculating to figure out which alternative is the best one. This will settle on choices about the best speculation for your organization. It's vital to decide a wide exhibit of variables to figure out which venture is the best alternative for your organization. The board bookkeeping can accomplish that objective adequately.

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3) Anticipating the Future

The way toward determining helps basic leadership and answers address like whether the organization should purchase greater hardware, secure another organization, enhance into new markets, and so forth. These are immeasurably vital inquiries and the executives bookkeeping can enable o to answer every one of them. It's likewise compelling in anticipating future business patterns.

There's no chance to get off knowing the fate of the business world. In any case, this should at present be possible dependent on current measurements and past patterns. Bookkeeping is a basic piece of the procedure since it includes different figures identified with the organization's cash matters. That, thus, can help to successful venture future activities of the business.

Management accounting vs Financial accounting

	Financial Accounting	**Management Accounting**
Objectives	The main objectives of financial accounting are to disclose the end results of the business, and the financial condition of the business on a particular date.	The main objective of managerial accounting is to help management by providing information that is used to plan, set goals and evaluate these goals.
Audience	Financial accounting produces information that is used by external parties, such as shareholders and lenders.	Managerial accounting produces information that is used within an organization, by managers and employees.
Optional	It is legally required to prepare financial accounting reports and share them with investors.	Managerial accounting reports are not legally required.
Segment reporting	Pertains to the entire organization. Certain figures may be broken out for materially significant business units.	Pertains to individual departments in addition to the entire organization.
Focus	Financial accounting focuses on history; reports on the prior quarter or year.	Managerial accounting focuses on the present and forecasts for the future.

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	Financial Accounting	Management Accounting
Format	Financial accounts are reported in a specific format, so that different organizations can be easily compared.	Format is informal and is on a per department/company basis as needed.
Rules	Rules in financial accounting are prescribed by standards such as GAAP or IFRS. There are legal requirements for companies to follow financial accounting standards.	Managerial accounting reports are only used internally within the organization; so they are not subject to the legal requirements that financial accounts are.
Reporting frequency and duration	Defined - annually, semi-annually, quarterly, and yearly.	As needed - daily, weekly, monthly.
Information	Monetary, verifiable information.	Monetary and company goal driven information.

Difference between Cost Accounting and Management Accounting

Basis	Cost Accounting	Management Accounting
Meaning	Cost accounting is an accounting system that aspires to capture an enterprise's costs of manufacturing by evaluating the input costs of every step of manufacturing as well as the fixed costs, namely, depreciation of capital equipment.	Management Accounting refers to the outlining of financial and non-financial data for the utilisation of management of the enterprise. It is also known as managerial accounting.
Data type	Quantitative	Both Quantitative and Qualitative

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Scope	Focused on distribution, allocation, determination and accounting factors of the cost	Convey (impart) and effect factor of the cost
Objective	Determined in cost production	Furnishing data to the managers to fix goals and anticipate strategies
Specific procedure	Yes	No
Planning	Short term planning	Both Short and long term planning
Recording	Records both past and present data	Focuses more on scrutinizing for future projects
Interdependency	Can be installed without a Management accounting	Cannot be installed without cost accounting

FINANCIAL STATEMENT ANALYSIS

Financial Statement Analysis (FSA) can also be defined as the process of identifying financial strengths and weaknesses of the firm by properly establishing relationship between the items of the balance sheet and the profit and loss account.

Financial Ratios and Financial Statement Analysis emphasizes on the influence of financial analysis in business. The important figures in a financial statement are intertwined by many a relationship. It helps the analyst in comprehending these relationships and how each one plays its vital role in understanding a business's growth, performance, scalability and other zones of it.

METHODS OF FINANCIAL STATEMENT ANALYSIS

There are various methods or techniques that are used in analyzing financial statements, such as:

1. Comparative Statements

2. Common Size Percentages

3. Trend Analysis

4. Ratios Analysis.

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Financial statements are prepared to meet external reporting obligations and also for decision making purposes. They play a dominant role in setting the framework of managerial decisions.

Analysts work in a variety of positions. Some are equity analysts whose main objective is to evaluate potential equity (share) investments to determine whether a prospective investment is attractive and what an appropriate purchase price might be.

Meaning of Ratio Analysis:

Ratio analysis is a quantitative method of gaining insight into a company's liquidity, operational efficiency, and profitability by studying its financial statements such as the balance sheet and income statement. Ratio analysis is a cornerstone of fundamental equity analysis.

Types of Ratio Analysis:

1. Liquidity Ratios:

Liquidity ratios measure a company's ability to pay off its short-term debts as they become due, using the company's current or quick assets. Liquidity ratios include the current ratio, quick ratio, and working capital ratio.

2. Solvency Ratios:

Also called financial leverage ratios, solvency ratios compare a company's debt levels with its assets, equity, and earnings, to evaluate the likelihood of a company staying afloat over the long haul, by paying off its long-term debt as well as the interest on its debt. Examples of solvency ratios include: debt-equity ratios, debt-assets ratios, and interest coverage ratios.

3. Profitability Ratios:

These ratios convey how well a company can generate profits from its operations. Profit margin, return on assets, return on equity, return on capital employed, and gross margin ratios are all examples of profitability ratios.

4. Efficiency Ratios:

Also called activity ratios, efficiency ratios evaluate how efficiently a company uses its assets and liabilities to generate sales and maximize profits. Key efficiency ratios include: turnover ratio, inventory turnover, and days' sales in inventory.

5. Coverage Ratios:

Coverage ratios measure a company's ability to make the interest payments and other obligations associated with its debts. Examples include the times interest earned ratio and the debt-service coverage ratio.

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6. Market Prospect Ratios:

These are the most commonly used ratios in fundamental analysis. They include dividend yield, P/E ratio, earnings per share (EPS), and dividend pay out ratio. Investors use these metrics to predict earnings and future performance.

Comparative statement problems:

From the following Balance Sheet, prepare Comparative Balance Sheet of Sun Ltd.:

Particulars	Note No.	31st March, 2019 Rs	31st March, 2018 Rs
I. EQUITY AND LIABILITIES			
1. Shareholder's Funds			
(a) Share Capital		3,50,000	3,00,000
2. Non-Current Liabilities			
Long-term Borrowings		1,00,000	2,00,000
3. Current Liabilities :			
Trade Payables		1,50,000	1,00,000
Total		**6,00,000**	**6,00,000**

II. ASSETS			
1. Non-Current Assets			
Fixed Assets (Tangible)		4,00,000	3,00,000
2. Current Assets			
Trade Receivables		2,00,000	3,00,000
Total		**6,00,000**	**6,00,000**

ANSWER:

In the books of Sun Ltd.
Comparative Balance Sheet
as at March 31, 2018 and 2019

Particulars	2018 Rs	2019 Rs	Absolute Change Rs	Percentage Change (%)
I. Equity and Liabilities				
1. Shareholders' Funds				
a. Share Capital	3,00,000	3,50,000	50,000	16.67
Shareholders' Fund	3,00,000	3,50,000	50,000	16.67

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2. Non-Current Liabilities				
a. Long-term Borrowings	2,00,000	1,00,000	(1,00,000)	(50.00)
3. Current Liabilities				
a. Trade Payables	1,00,000	1,50,000	50,000	50.00
Total	**6,00,000**	**6,00,000**	**–**	**–**
II. Assets				
1. Non-Current Assets				
a. Fixed Assets (Tangible)	3,00,000	4,00,000	1,00,000	33.33
2. Current Assets				
a. Trade Receivables	3,00,000	2,00,000	(1,00,000)	(33.33)
Total	**6,00,000**	**6,00,000**	**–**	**–**

Common size statement problem:

From the following Statement of Profit and Loss of Star Ltd., for the year ended 31st March, 2015 and 2016, prepare a Common-size statement:

Particulars	Note No.	2015-16	2014-15
Revenue from Operations		25,00,000	Rs 20,00,000
Employee Benefit Expenses		Rs 10,00,000	Rs 7,00,000
Other Expenses		Rs 2,00,000	Rs 3,00,000
Tax Rate		40%	40%

ANSWER:

Common Size Statement of Profit and Loss
for the year ended March 31, 2015 and 2016

Particulars	Absolute Amount		Percentage of Revenue from Operations	
	2014-15 (Rs)	2015-16 (Rs)	2014-15 (%)	2015-16 (%)
I. Revenue from Operations	20,00,000	25,00,000	100	100
II. Other Income				
Total Revenue (I + II)	20,00,000	25,00,000	100	100
Less: Expenses:				

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Employees Benefit cost	7,00,000	10,00,000	35	40
Other Expenses	3,00,000	2,00,000	15	8
Profit before Tax	10,00,000	13,00,000	50	52
Less: Tax @ 40%	4,00,000	5,20,000	20	20.80
Profit after Tax	6,00,000	7,80,000	30	31.20

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UNIT - II

The Funds Flow Statement is a statement which shows the movement of funds and is a report of the financial operations of the business undertaking. It indicates various means by which funds were obtained during a particular period and the ways in which these funds were employed In simple words, it is a statement of sources and applications of funds.

PROCED URE FOR PREPARING A FUNDS FLOW STATEMENT

The preparation of a funds flow statement consists of two parts:

a) Statement or Schedule of Charges in Working Capital.

b) Statement of Sources and Application of Funds.

a) Statement or Schedule of Changes in Working Capital:

Working Capital means the excess of current assets over current liabilities. Statement of changes in working capital is prepared to show the changes in the working capital between the two balance sheet dates. This statement is prepared with the help of current assets and current liabilities derived from the two balance sheets.

As, Working Capital=Current Assets -Current Liabilities. So,

I. An increase in current assets increases working capital.

II. A decrease in current assets decreases, working capital.

III. An increase in current liabilities decreases working capital.

IV. A decrease in current liabilities increases working capital.

Statement of Schedule of Changes in Working Capital:

Effect on Working Capital

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Particulars Current Assets:	Previous year	Current year	Increase	Decrease
Cash in hand Cash at bank Bills receivable				
Sundry Debtors Temporary Investments Stocks/Inventories				
Prepaid Expenses Accrued Incomes Total Current Assets				
Current Liabilities: Bills Payable Sundry Creditors				
Outstanding Expenses Bank Overdraft Short-term Advances				
Dividends Payable Proposed Dividends* Provision for taxation*				
Total current Liabilities				
Working Capital(CA-CL) Net Increase\Decrease in working capital				

1. Prepare a Statement of changes in Working Capital from the following Balance Sheets of SSM and Company Limited.

Balance Sheets as at December31

Liabilities	2015 Rs.	2016 Rs.	Assets	2015Rs.	2016Rs.
Equity Capital	5,00,000	5,00,000	Fixed Assets	6,00,000	7,00,000
Debentures	3,70,000	4,50,000	Long-term Investment	2,00,000	1,00,000
Tax Payable	77,000	43,000	Work-in-Progress	80,000	90,000
Accounts Payable	96,000	1,92,000	Stock-in-trade	1,50,000	2,25,000
Interest Payable	37,000	45,000	Accounts Receivable	70,000	1,40,000
Dividend Payable	50,000	35,000			

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Cash	30,000	10,000			
	1130000	**1265000**		**1130000**	**1265000**

Solution:

STATEMENTOFCHANGESINWORKINGCAPITAL:

Particulars	**2006 Rs.**	**2007Rs.**	**Increase**	**Decrease**
Current Assets:				
Cash	30,000	10,000	---	20,000
Accounts Receivable	70,000	1,40,000	70,000	---
Stock-in-trade	1,50,000	2,25,000	75,000	---
Work-in-progress	80,000	90,000	10,000	---
	3,30,000	**4,65,000**	**---**	**---**
Current Liabilities:				
Tax Payable	77,000	43,000	34,000	---
Accounts Payable	96,000	1,92,000	---	96,000
Interest Payable	37,000	45,000	---	8,000
Dividend Payable	50,000	35,000	15,000	---
	2,60,000	**3,15,000**	---	---
Working Capital	70,000	1,50,000	---	---
(CA-CL) Net				
Increase in Working Capital	80,000	---	---	80,000
	1,50,000	**1,50,000**	**2,04,000**	**2,04,000**

2.FromthefollowingBalanceSheetofMr.A,Prepareascheduleofchangesinworkcapitalandfunds flow statement:

Liabilities	**2016**	**2017**	**Assets**	**2016**	**2017**
Capital	63,000	1,00,000	Cash	15,000	20,000
Long-term Borrowings	50,000	60,000	Debtors	30,000	28,000
Trade Creditors	42,000	39,000	Stock-in-trade	55,000	72,000
Bank Overdraft	35,000	25,000	Land Buildings	80,000	1,00,000
Outstanding Expenses	5,000	6,000	Furniture	15,000	10,000
	195000	230000		195000	230000

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Solution: Schedule of Changes in Working Capital

	2016	2017	Effect on Working Capital	
Current Assets	**Rs.**	**Rs.**	**Increase**	**Decrease**
Cash	15,000	20,000	5,000	
Debtors	30,000	28,000	2,000	
Stock-in-Trade	55,000	72,000	17,000	
Current Liabilities	1,00,000	1,20,000		
Trade Creditors	42,000	39,000	3,000	
Bank overdraft	35,000	25,000	10,000	
Outstanding Expenses	5,000	6.000	1,000	
	7,000			
Working capital	50000			
(C.A.–C.L.)				
Net Increase	32000			
In working capital	50000	35000	35000	

FUND FLOW STATEMENT

Sources	Rs.	Applications	Rs.
Raising of long- term borrowings (60000-50000)	10000	Purchases of land &Building (100000-80000)	20000
Sales of furniture(15000-10000)	5000	Net increase in working capital	32000
Funds from operations	37000		
	52000		52000

CASH FLOW STATEMENT

Cash plays a very important role in the entire economic life of a business. Recognizing the importance of cash flow statement, the Institute of Chartered Accountants of India (ICAT) issued. AS-3 Revised: Cash flow Statements in March, 1997.

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Meaning:

Cash Flow Statement is a statement which describes the inflows (sources) and outflows (uses) of cash and cash equivalents in an enterprise during a specified period of time. A cash flow statement summarizes the causes of changes in cash position of a business enterprise between dates of two balance sheets. According to AS-3 (Revised), an enterprise should prepare a cash flow Statement and should present it for each period for which financial statements are prepared.

The terms cash, cash equivalents and cash flows are used in this statement with the following meanings:

FORMAT FOR CASH FLOW STATEMENT:

Cash flow from operations:		XXX
Add: Depreciation	xxx	
Increase in current		
Liabilities	xxx	
Decrease in current		
Assets	xxx	XXX
Less: Income tax	xxx	
Decrease in current		
Liabilities	xxx	
Increase in current		
Assets	xxx	XXX
Cash equivalent		XXX

PROCEDUREFORPREPARINGACASHFLOWSTATEMENT:

Cash flow statement is not a substitute of income statement, i.e., a profit arid loss account, and a balance sheet. It provides additional information and explain the reasons for changes in cash and cash equivalents, derived from financial statements at two points of time.

The preparation of cash flow statement involves the following steps:

Step1:

Compute the net increase or decrease in cash and cash equivalents by makings comparison of the accounts given in the comparative balance sheets.

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Step2:

Calculate the net cash flow provided (used in) operating activities by analysing the profit and loss account, balance sheet and additional information. There are two methods of converting net income into net cash flows from operating activities: the direct method and the indirect method.

These methods have been discussed separately in this chapter.

Step3:

Calculate the net cash flow from investing activities.

Step4:

Calculate the net cash flow from financing activities.

Step5:

Prepare a formal cash flow statement highlighting the net cash flow from(used in) operating, investing and financing activities separately.

Step6:

Make an aggregate of net cash flows from the three activities and ensure that the total net cash flow is equal to the net increase or decrease in cash and cash equivalents as calculated in Step 1.

Step7:

Report significant non-cash transactions that did not involve cash or cash equivalents in a separate schedule to the cash flow statement e.g., purchase of machinery against issue of share capital or redemption of debentures in exchange for share capital.

METHODS OF CALCULATING CASH FLOWS FROM (USED IN) OPERATING ACTIVITIES:

There are two methods of reporting cash flows from operating activities the direct method and the indirect method.

1. The Direct Method:

Under the direct method, cash receipts (inflows) from operating revenues and cash payments (outflows) for operating expenses are calculated to arrive at cash flows from operating activities. The difference between the cash receipts and cash payments is the net cash flow provided by (or used in) operating activities. The following are the examples of cash receipts and cash payments (called cash flows) resulting from activities:

a. Cash receipts from the sale of goods and the rendering of services;

b. Cash receipts from royalties, fees, commissions and to the revenues;

c. Cash payment to suppliers for goods and services;

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d. Cash payment to and on behalf of employees;

e. Cash receipts and cash payment of an insurance enterprise for premiums and claims, annuities and other policy benefits;

f. Cash payments or refund of income taxes unless they can be specifically identified with financing and investing activities;

g. Cash receipts and payments relating to future contracts, forward contracts, option contracts and swap contracts when the contracts are held for dealing or trading purposes.

The information about major classes of gross cash receipts and gross cash payments may be obtained either:

1. From accounting records of the enterprise;
2. By adjusting sales, cost of sales (interest and similar income and interest expense and similar charges for a financial enterprise) and other items in the statement of profit and loss for :

Changes during the period in inventories and operating receivables and

a. Other non-cash items

b. Other items for which the cash effects are investing or financing cash flows.

The following calculation is given to illustrate the point with imaginary figures:

	Rs.
(i) Credit Sales given	670000
Add: Opening Balance of Trade Debtors (Debtors +B/R)	80000
	750000
Less: Closing Balance of Trade Debtors	110000
Cash received from debtors/customers	640000
(ii)Cost of Goods Sold (given)	450000
Add: Closing Stock	30000
	480000
Less: Opening Stock	20000
Purchases on accrual basis	460000
(iii)Credit Purchases	460000
Add: Opening Balance of Trade Creditors(Creditors +B/P)	60000
	520000
Less: Closing Balance of Trade Creditors	90000
Cash paid to creditors/suppliers	430000
(iv)Salary as charged to Profit and Loss A/c	75000
Add: Opening Balance of Outstanding Salary	10000
	85000

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Less: Closing Balance of Outstanding Salary	5000
Cash paid to employees on account of salaries	80000

Illustration:

From the following information, calculate cash flows from operating activities.

	Rs.
Total sales fo the year	250000
Total purchases for the year	200000
Trade debtors as on 1.7.2007	12000
Trade creditors as on 1.7.2007	14500
Trade debtors as on 30.6.2008	20800
Trade creditors as on 30.6.2008	21600
Total operating expenses for the year	10200
Outstanding expenses as on1.7.2007	1800
Prepaid expenses as on 1.7.2007	1500
Outstanding expenses as on30.6.2008	2400
Prepaid expenses as on 30.6.2008	2200
Income tax paid during the year	2000

Solution:

Cash flows from operating activities	
Cash receipts from customers (workingNote:1)	241200
Cash paid to supplies and employees (workingnote:2)	203200
Cash generated from operations	38000
Income tax paid	2000
Net cash flows from operating activities	36000

Working notes:

Calculate of cash receipts from customers:

Calculation of cash receipts from customers:	Rs.
Sales for the year	2,50,000
Add: Trade debtors as on1.7.200712,000	2,62,000
Less: Trade debtors as on 30.6.2008	20,800
Cash receipts from customers	2,41,200

2. Calculation of cash paid to suppliers and employees:

Total purchases for the year	2,00,000
Add: Trade creditors as on 1.7.2007	14.500
	2,14,500
Less: Trade creditors as on 30.6.2008	21.600
Cash paid to creditors for purchase of goods (a)	1.92.900
Total operating expenses for the year	10,200
Add: Outstanding expenses as on1.7.2007	1,800
	12,000

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Less: Outstanding expenses as on 30.6.2008	2.400	
	9,600	
Add:Prepaidexpensesason30.6.2008	2.200	
	11,800	
Less: Prepaid expenses as on1.7.2007	1.500	
Cash paid for services and expenses(b)	10.300	
Cash paid to suppliers and employees (a+b) or	(1,92,900 +10,300)	203200

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UNIT - III

BUDGET AND BUDGETARY CONTROL

Meaning and Definition:

Budget:

According to CIMA (Chartered Institute of Management Accountants) UK, a budget is "A plan quantified in monetary terms prepared and approved prior to a defined period of time, usually showing planned income to be generated and, expenditure to be incurred during the period and the capital to be employed to attain a given objective."

In a view of Keller & Ferrara, "A budget is a plan of action to achieve stated objectives based on predetermined series of related assumptions."

G.A.Welshstates,"Abudgetisawrittenplancoveringprojectedactivitiesofafirmforadefinitetime period."

Budgetary Control:

Budgetary Control is a method of managing costs through preparation of budgets. Budgeting is thus only a part of the budgetary control. According to CIMA, "Budgetary control is the establishment of budgets relating to the responsibilities of executives of a policy and the continuous comparison of the actual with the budgeted results, either to secure by individual action, the objective of the policy or to provide a basis for its revision."

Importance of Budgetary Control:

1. **To Use the Forecasting Techniques**

   It is the importance of budgetary control that with this, we can use the forecasting techniques. Three departments work hard for calculating best estimation of future. Accounting department provides old data. Statistical department provides the tools and techniques of forecasting like probability, time series other sampling methods. Management department uses both department services to estimate the expenditures and revenue of business under the normal conditions of business. So, no department say anything wrong in making of budget. So, it is necessary for business to use budgetary control techniques.

2. **Fix the Responsibility of Departments**

   Department's scientific name is cost center. Manager makes budget and show the target of company and employees are given the powers to perform these targets. After checking the variance in budget through budgetary control process, manager can fix the responsibility of each department and its employees in a particular cost center.

3. **Effective Utilization of Company's resources**

   Company can only effective use its resources, if someone stops misuse of money and fund of company. If budgetary control is used in company, at that time, no action will be taken before making budget. Responsible personal of company will be accountable for his action. Suppose, company has fixed the target of company's annual Sale is $ 40,00,000 after

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participating sales manager in the setting of this sale budget. Now, after one year, if sale is just $ 1,00,000. This sale manager must say what is the reason for not selling the product up to standard level of sale.

4. Excel yourself

After using budgetary control techniques in your business, you will definitely learn the skills of excel yourself because we all know that a budget is based on estimates, it may or may not be true. But continually practice of making good budget and apply in organization, manager can learn skills and experience for increasing the efficiency in every work of company. Meaning of this, manager will get positive approach through budgetary control.

ADVANTAGES:

1. This system provides basic policies for initiatives.
2. It enables the management to perform business in the most professional manner becausebudgetsarepreparedtogettheoptimumuseofresourcesandtheobjectivesframed.
3. It ensures team work and thus encourages the spirit of support and mutual understanding among the staff.
4. It increases production efficiency, eliminates waste and controls the costs.
5. It shows to them management where action is needed to remedy a position.
6. Budgeting also aids in obtaining bank credit.
7. It reviews the present situation and pinpoints the changes which are necessary.
8. With its help, tasks such as like planning, coordination and control happen effectively and efficiently.
9. It involves an advance planning which is looked upon with support by many credit agencies as a marker of sound management.

Classification of Budget:

The extent of budgeting activity varies from firm to firm. In a smaller firm there may be a sales forecast, a production budget, or a cash budget. Larger firms generally prepare a master budget. Budgets can be classified into different ways from different points of view. The following are the important basis for classification:

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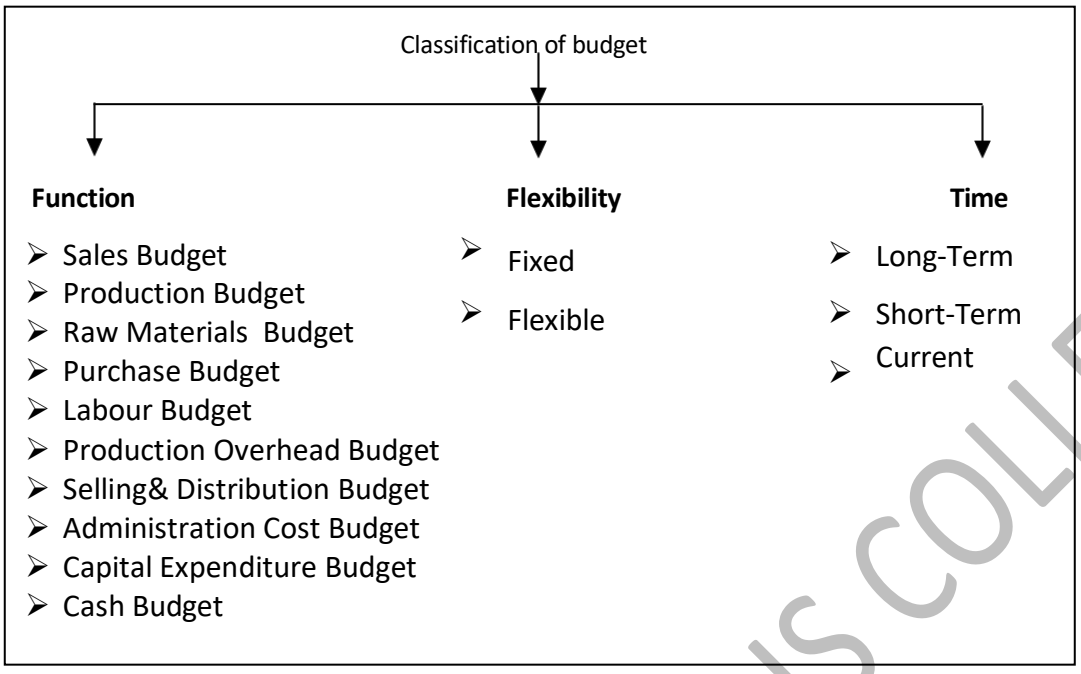

The cash budget is a sketch of the business estimated cash inflows and outflows over a specific period of time. Cash budget is one of the most important and one of the last to be prepared. It is a detailed projection of cash receipts from all sources and cash payments for all purposes and the resultants cash balance during the budget. Itisamechanismforcontrollingandcoordinatingthefiscalsideofbusiness to ensure solvency and provides the basis for forecasting and financing required to cover up any deficiency in cash. Cash budget thus plays a vital role in the financing management of a business under taken. Cash budget assists them an agreement in determining the future liquidity requirements of the firm, fore casting for business of those needs, exercising control over cash. So, cash budget thus plays a vital role in the financial management of a business enterprise.

Model of Cash Budget:

Particular	January	February	March
Opening Balance	-	-	-
Add: Receipts:			
Cash Sales	-	-	-
Receipts from Debtors	-	-	-
Interest and Dividend	-	-	-
Sale of fixed assets	-	-	-
Sale of Investments	-	-	-
Bank Loan	-	-	-
Issue of Shares &Debenture	-	-	-
Others	-	-	-

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Total Receipts(A)	-	-	-
Less: Payments			
Cash Purchases	-	-	-
Payment to creditors	-	-	-
Salaries &wages	-	-	-
Administrative expenses	-	-	-
Selling expenses	-	-	-
Dividend payable	-	-	-
Purchase of Fixed Assets	-	-	-
Repayment of Loan	-	-	-
Payment of taxes	-	-	
Total Payments (B)	-	-	-
Closing Balance(A-B)	-	-	-

FLEXIBLEBUDGET:

This is a dynamic budget. In comparison with a fixed budget, a flexible budget is one "which is designed to change in relation to the level of activity attained."An equally accurate use of the flexible budgets is for the purposes of control.

Flexible budgeting has been developed with the objective of changing the budget figures so that they may correspond with the actual output achieved. It is more sensible and practical, because changes expected at different levels of activity are given due consideration. Thus a budget might be prepared for various levels of activity in accord with capacity utilization.

MODELOFFLEXIBLE BUDGET:

Particulars	Capacity Utilization		
	60%	80%	100%
1.PrimeCost:			
-Direct Material	-	-	-
-Direct Labour	-	-	-
-Direct expenses (if any)	-	-	-
Total(A)	-	-	-
2.Variableoverheads:			
-Maintenance &repairs	-	-	-
-Indirect Labour	-	-	-
-Indirect Material	-	-	-
-Factory overheads	-	-	-
-Administrative Overheads	-	-	-
-Selling& distribution O/H	-	-	-
Total(B)	-	-	-

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3.MarginalCost(A+B)	-	-	-
4. Sales	-	-	-
5.Contribution (Sales-MC)	-	-	-
6.Fixedcost			
-Factory overheads	-	-	-
-Administrative Overheads	-	-	-
-Selling & distribution O/H	-	-	-
Total(C)	-	-	-
7.ProfitorLoss(C-FC)	-	-	-

ZEROBASEBUDGETING:

The 'Zero-Base' refers to a 'nil-budget' as the starting point. It starts with a presumption that the budget for the next period is 'zero' until the demand for a function, process, or project is not justified for single penny. The assumption is that without such justification, no expenditure will be allowed. In effect, each manager or functional head is required to carry out cost-benefit analysis of each of the activities, etc. under his control and for which he is responsible.

The method of ZBB suggests that the business should not only make decision about the proposed new programmes but it should also, regularly, review the suitability of the existing programmes. This approach of preparing a budget is called incremental budgeting's Ince the budget process is concerned mainly with the increases or changes in operations that are likely to occur during the budget period.

BUDGET AND BUDGETARY CONTROL PROBLEMS AND SOLUTIONS:

Prepare a Flexible budget for overheads on the basis of the following data.
Ascertain the overhead rates at 50%and60%capacity.

Variable overheads:	At 60% capacity (Rs)
Indirect Material Labour	6,000 18,000
Semi-variable overheads: Electricity:(40%Fixed&60%variable) Repairs:(80%fixed&20%Variable)	 30,000 3,000
Fixed overheads: Depreciation Insurance Salaries	 16,500 4,500 15,000
Total overheads	93,000

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Estimated direct labour hours	1,86,000

Flexible Budget (at 50%and60%capacity)

Particulars	50%capacity	60%capacity
Variable overheads:		
Indirect Material	5000	6,000
Labour	15,000	18,000
Semi– variable Overheads:		
Electricity	27,000	30,000
Repairs	2,900	3,000
Fixed Overheads:		
Depreciation	16,500	16,500
Insurance	4,500	4,500
Salaries	15,000	15,000
Total Overheads	85,900	93,000
Estimated Direct Labour hours	1,55,000	1,86,000
Overhead rate	0.55	0.50

CASH BUDGET

1. Saurashtra Co. Ltd. Wishes to arrange overdraft facilities with its bankers from the period August to October 2019 when it will be manufacturing mostly for stock. Prepare a cash budget for the above period from the following data given below:

Month	Sales (Rs.)	Purchases (Rs.)	Wages (Rs.)	Mfg. Exp. (Rs.)	Office Exp. (Rs.)	Selling Exp. (Rs.)
June	1,80,000	1,24,800	12,000	3,000	2,000	2,000
July	1,92,000	1,44,000	14,000	4,000	1,000	4,000
August	1,08,000	2,43,000	11,000	3,000	1,500	2,000
September	1,74,000	2,46,000	12,000	4,500	2,000	5,000
October	1,26,000	2,68,000	15,000	5,000	2,500	4,000
November	1,40,000	2,80,000	17,000	5,500	3,000	4,500
December	1,60,000	3,00,000	18,000	6,000	3,000	5,000

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Additional Information:

a) Cashonhand1-08-2010Rs.25,000

b) 50% of credit sales are realized in the month of following the sale and the remaining 50% in the second month following. Creditors are paid in the month following the month of purchase.

c) Lag in payment of manufacturing expenses half month.

d) Lag in payment of other expenses one month.

For 3 months from August to October 2019

Particulars	August (Rs.)	September (Rs.)	October (Rs.)
Receipts:			
Opening balance	25,000	44,500	(66,750)
Sales	1,86,000	1,50,000	1,41,000
Total Receipts(A)	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
Total payments(B)	1,66,500	2,61,250	2,69,750
Closing Balance(A-B)	44,500	(66,750)	(1,95,500)

Working Note: Manufacturing Expense:

Particular	August	September	October
July (4000/2)	2000	---	---
August (3000/2)	1500	1500	---
September (4500/2)	---	2250	2250
October (5000/2)	---	----	2500
Total	3500	3750	4750

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Sales

Particular	August	September	October
June (180000/2)	90000	---	---
July (192000/2)	96000	96000	---
August (108000/2)	---	54000	54000
September (174000/2)	---	----	87000
Total	186000	150000	141000

2. Prepare cash Budget of R.M.C.LTD. for April, May and June2019:

Months	Sales (Rs.)	Purchases (Rs.)	Wages (Rs.)	Expenses (Rs.)
Jan. (Actual)	80,000	45,000	20,000	5,000
Feb. (Actual)	80,000	40,000	18,000	6,000
March (Actual)	75,000	42,000	22,000	6,000
April (Budget)	90,000	50,000	24,000	7,000
May (Budget)	85,000	45,000	20,000	6,000
June (Budget)	80,000	35,000	18,000	5,000

Additional Information:

a) 10% of the purchases and 20% of sales are for cash.

b) The average collection period of the company is ½ month and the credit purchases are paid regularly after one month.

c) WagesarepaidhalfmonthlyandthereofRs.500 included in expenses are paid monthly and other expenses are paid after one-month lag.

d) Cash balance on April1,2019 maybeassumedtobeRs.15,000

(For the month sending April, May&June2019)

Particulars	April(Rs.)	May(Rs.)	June(Rs.)
Receipts:			
Opening Balance Cash	15,000	27,200	35,700

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Sales Collection from	18,000	17,000	16,000
Debtors	66,000	70,000	66,000
Total Receipts(A)	99,000	1,14,200	1,17,700
Payments:			
Cash Purchases	5,000	4,500	3,500
Payment to creditors	37,800	45,000	40,500
Wages	23,000	22,000	19,000
Rent	500	500	500
Other Exp.	5,500	6,500	5,500
Total Payments(B)	71,800	78,500	69,000
Closing balance	27,200	35,700	48,700

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UNIT - IV

STANDARD COSTING

STANDARD COST:

Standard Cost as defined by the Institute of Cost and Management Accountant, London "is the Predetermined Cost based on technical estimate for materials, labour and overhead for a selected period of time and for a prescribed set of working conditions".

STANDARDCOSTING:

Chartered Institute of Management Account ants England defines Standard Costing as "the Preparation and use of standard costs, their comparison with actual costs and the analysis of variances to their causes and points of incidence".

ADVANTAGESOFSTANDARDCOSTING:

The following are the important advantages of standard costing:

- It guides the management to evaluate the production performance.
- It helps the management in fixing standards.
- Standardcostingissuefullinformulatingproductionplanningandpricepolicies.
- It guides as a measuring rod for determination of variances.
- It facilitates eliminating in efficiencies by taking corrective measures.

LIMITATIONSOFSTANDARDCOSTING:

Besides all the benefits derived from this system, it has a number of limitations which are given below:

- ✓ Standard costing is expensive and a small concern may not meet the cost.
- ✓ Due to lack of technical aspects, it is difficult to establish standards.
- ✓ Standardcostingcannotbeappliedinthecaseofa-concernwherenon-standardized products are produced.
- ✓ Fixingofresponsibilityisdifficult.Responsibilitycannotbefixedinthecaseof uncontrollable variances.
- ✓ Frequentrevisionisrequiredwhileinsufficientstaffisincapableofoperatingthissystem.

Differences: Though Standard Costing and Budgetary Controls are aims at the maximum efficiencies and Marginal Cost, yet there are some basic differences between the two from the objectives of using the two costs.

Budgetary Control	Standard Costing
(1) Budgets are projections of financial accounts.	(1) Standard Costing a projection of cost accounts.
(2) As a statement of both income and expenses it forms part of budgetary control.	(2) Standard costing is not used for the Purpose of forecasting.

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(3) Budgets are estimated costs. They are "what the cost will be."	(3) Standard Cost are the "Norms" or" what Cost should be."
(4) It is applied to any industry engaged in mass production.	(4) It is applicable to concern engaged in Construction work.
(5) It is a part of accounting system and standard costing variances are recorded in The books of accounts.	(5) It is not a part of accounting system because it is based on statistical facts and figures.

VARIANCEANALYSIS:

Standard Costing guides as a measuring rod to the management for determination of "Variances" in order to evaluate the production performance. The term "Variances" maybe defined as the difference between Standard Cost and actual cost for each element of cost incurred during a particular period. The term "Variance Analysis" may be defined as the process of analyzing variance by subdividing the total variance in such a way that management can assign responsibility for off- Standard Performance.

The variance may be favourable variance or unfavourable variance. When the actual performance is better than the Standard, it resents "Favourable Variance". "Similarly, where actual performance is below the standard it is called as "Unfavourable Variance."

The reasons for the difference between the actual performance and budgeted performance. The person responsible for poor performance. Remedial actions to be taken.

Types of Variances: Variances may be broadly classified in to two categories

(A)Cost Variance and(B)Sales Variance.

(A) Cost Variance: Total Cost Variance is the difference between Standards Cost for the Actual Output and the Actual Total Cost incurred for manufacturing actual output. The Total Cost Variance Comprises the following:

Direct Material Variances/Material Cost Variances (MCV): The Material Cost Variance is the difference between the Standard cost of materials for the Actual Output and the Actual Cost of materials used for producing actual output.

MCV=SC- ACOR

MCV=(SQ x SP)-(AQ x AP)

Where,

SC=standard cost; AC=actual cost; SQ=standard quantity; SP=standard price; AQ=actual quantity; AP=actual price.

Material Price Variance (MPV): MPV is the difference between the standard cost of actual quantity and actual cost for actual quantity.

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MPV=(SP-AP)x AQ

Material Usage Variance (MUV):MUV is the difference between the standard cost of standard quantity of material for actual output and the Standard cost of the actual material used.

MUV=SP x (SQ-AQ)

Material Mix Variance (MMV): It is the portion of the material usage variance which is due to the difference between the Standard and the actual composition of mix. Material Mix Variance is calculated under two situations as follows:

When Actual Weight and Standard Weight of Mix are equal:

The formula is used to calculate the Variance:

MMV=SP x(SQ-AQ)

In case standard quantity is revised due to short age of a particular category of materials, the formula will be changed as follows:

MMV=SP x(RSQ-AQ)

Where, RSQ= Revised standard quantity

When Actual Weight and Standard Weight of Mix are different:

The formula used to calculate the Variances:

MMV=(Total weight of actual mix/Total weight of standard mix X standard cost of standard mix) – standard cost of actual mix

In case the standard is revised due to the shortage of a particular category of materials, the alternative formula will be as follows:

MMV= (Total weight of actual mix/ Total weight of standard mix X standard cost of revised standard mix)- standard cost of actual mix

(3) Materials Yield Variance (MYV): It is the portion of Material Usage Variance. This variance arises due to spoil age, low quality of materials and defective production planning etc. Materials Yield Variance may be defined as "the difference between the Standard Yield Specified and the Actual Yield Obtained. "This variance may be calculated as under:

MYV=SR x (AY-SY)

Where, AY=Actual Yield, SY=Standard Yield and Standard Rate are calculated as follows:

Standard Rate=Standard cost of standard mix/Net standard output.

Verification:

MCV=MPV+MUV

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MUV=MMV+MYV

Notes-positive means favourable(F)and negative means adverse(A).

MATERIALVARIANCE

Problem –1:

A manufacturing concern, which has adopted standard costing, furnished the following information:

Standard Material for 70 kg finished product: 100 kg. Price of materials: Re.1 per kg. ActualOutput:2,10,000kg. Materialused:2,80,000kg. Cost of material: Rs.2,52,000. Calculate: Material Usage Variance(b)Material Price Variance(c)Material Cost Variance

Solution:

Standard quantity	For70kgstandardoutput
	Standard quantity of material=100kg.
	2,10,000kg. of finished products
	2,10,000/70x100=3,00,000kg.
(2) Actual price per kg.	Rs.2,52,000/2,80,000 =Re.0.90

(a)Material Usage Variance	=Standard Rate(Standard quantity for actual output–Actual quantity)
	=Re.1(3,00,000–2,80,000)
	=Re.1x20,000
	=Rs.20,000(favourable)

(b)Material Price Variance	=Actual quantity(Standard price-Actual price)
	2,80,000(Re.1–Re.0.90)
	2,80,000x Re.0.10
	Rs.28,000(Favourable)
(c)Material Cost Variance	=Standard quantity for actual output x Standard rate)–(Actual quantity x Actual rate)
	=(3,00,000 x1) – (2,80,000 x0.90)
	=Rs.3,00,000 x Rs. 2,52,000
	Rs.48,000(favourable)

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Verification:

MCV=MPV+MUV

Rs.48,000(F)=Rs.28,000(F)+Rs.20,000(F)

Problem2: For making 10kg. of yarn, the standard material requirement is:

Material	Quantity (kg.)	Rate per kg.(Rs.)
White	8	6.00
Black	4	4.00

InMarch,1,000kg. Of yarn was produced. The actual consumption of materials is asunder:

Material	Quantity (kg.)	Rate per kg.(Rs.)
White	750	7.00
Black	500	5.00

Calculate: (1)MCV (2)MPV (3)MUV

Solution:

Particular	Standardfor1000kgs.			Actualfor1000kgs.		
	Quantity	Rate	Amount	Quantity	Rate	Amount
A	800	6	4,800	750	7	5,250
B	400	4	1,600	500	5	2,500
Total	1,200		6,400	1,250		7,750

MCV:SC-AC=6,400-7,750=Rs.1,350(A)

MPV:(SP-AP)x AQ MUV:(SQ-AQ)x SP

A=(6-7)x750 =Rs.750(A) A=(800-750)x6=Rs.300(F)

B=(4-5)x500 =Rs.500(A) B=(400-500)x4=Rs.400(A)

=1,250(A) =Rs100(A)

From The Following Data Calculate Labour Cost Variance, Labour Rate Variance Labour, Efficiency Variance And Labour Mix Variance. Budgeted Labour For Completing Job X

8 Skilled Workers At Rs. 10 Per Hour For 20 Hours.

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12 Unskilled Workers At Rs.8 Per Hour For 20 Hours.

Actual Labours For Completing Job X.

12 Skilled Workers At Rs. 11 Per Hours For 20 Hours.

13 Unskilled Workers At Rs. 7 Per Hours For 20 Hours.

SOLUTION

	Budgeted Labour			**Actual Labour**		
Particular	**Total Hour**	**Per Hr Rate**	**Total**	**Total Hour**	**Per HR Rate**	**Total**
8 Skilled (8 × 20)	160	10	1,600	240 (12 ×20)	11	2,640
12 Unskilled (12 × 20)	240	8	1,920	260	7	1,820
	400		3,520	(13×20) 500		4,460

1. Labour Cost Variance :

(ST × SR) – (AT × AR)

Skilled Labour (160 × 10) -240 × 11 = 1,600 – 2,640 = 1040 A

Unskilled Labour (240 × 8) – (260 × 7) = 1,920 – 1,820 = 100F

Labour Cost Variance = 940F

2. Labour Rate Variance:

AT (SR-AR)

Skilled Labour 240 (10- 11) = 240 ×1 = 240 A

Unskilled Labour 260 (8-7) = 260 ×1 = 260 F

Labour Rate Variance = 20 F

3. Labour Efficiency Variance:

SR (ST – AT)

Skilled Labour 10 (160 – 240) = 10×80 = 800 A

Un Skilled Labour 8 (240 – 260) = 8×20 = 160 A

Labour Efficiency Variance = 960 A

Proof: MCV = MRV + MEV = 940 A = 20 F + 960 A

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4. Labour Mix Variance:

Since Both Total Standard Hours and Total Actual Hours Are Different. It Is Necessary To Find Revised Standard Hours.

Revised Standard Hour

= Total Time Of Actual Mix × Std Of Individual / Total Time Of Std Mix

Skilled = 500 / 400 × 160 = 200

Unskilled = 500 × 240 = 300

SR (RST – AT)

Skilled 10 (200 – 240) = 10 ×40 = 400 A

Unskilled 8 (300 – 260) = 8 × 40 = 320 F

Labour mix variance = 80 A

5. Revised labour efficiency variance:

= standard rate (std time for actual output – revised std time)

Skilled -10 (160 – 200) = 10 × 40 = 400 A

Unskilled 8 (240 – 300) = 8 × 60 = 480 A

Revised labour efficiency = 880A

LEV = LMV + RLEV = 960 A = 80A + 880A

Important Formulae Of Marginal Costing

1.MarginalCost Statement

Sales	xxx
Less: Variable Cost	xxx
Contribution	xxx
Less : Fixed Cost	xxx
Profit / Loss	xxx

2. Marginal Cost Equation

Sales= Variable Cost +Fixed Cost +/- Profit Or Loss

Sales –Variable Cost = Fixed Cost +/- Profit Or Loss

Sales - Variable Cost = Contribution

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Contribution = Fixed Cost+ Profit

It Is Denoted In Abbreviation

S = V + F + P

S – V = F + P

S – V = C

C = F + P

3.Marginal Cost:

=Direct Materials + Direct Wages+ Direct Expenses + Variable Overheads

(0r)

Expenses + Variable Over Heads

= Prime Cost + Variable Overheads (Or) Total Cost – Fixed Cost

4. P/V Ratio (Profit Volume Ratio)

P/V Ratio = Contribution / Sales × 100

To Find Contribution (By Cross) = Sales × P/V Ratio

To Find Sales (By Cross) = Contribution / P/V Ratio

(Or) P/V Ratio = Sales – Variable Cost/ Sales ×100

(Or) P/V Ratio = Fixed Cost + Profit/Sales ×100

5. P/V Ratio (When Two Period Are Given)

= Change In Profit / Change In Sales ×100

(Or) Change In Contribution/ Change In Sales ×100

6.Break Even Point (BEP)

At Break Even Point Contribution = Fixed Cost

a. Breakeven Sales (Units):

= Fixed Cost / Contribution Per Unit (Or) Break Even Sales/ Selling Price Per Unit

b. Break Even Sales (Rupees)

= Fixed Cost / P/V (Or) Fixed Cost × Sales Contribution

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7. Margin Of Safety (MOS)

Margin Of Safety = Actual Sales – Break Even Sales

a. Margin Of Safety In Rupees :

= Profit / P/V Ratio

b. Margin Of Safety In Units

=Profit / Contribution Per Unit

8. Required Sales For Given Profit:

a. Required Sales In Units :

= Fixed Cost+ Required Profit / Contribution Per Unit

b. Required Sales In Rupee:

= Fixed Cost +Required Profit / P/V Ratio

9. Profit From Given Sales

Contribution = Given Sales × P/V Ratio

Profit = Contribution –Fixed Cost

10. Fixed Cost :

= Break Even Sales × P/V Ratio

11. Variable Cost :

= Change In Cost / Change In Units

The Cost And Selling Price Remain The Same In Period 1 And Period 2 Find Out 1.P.V Ratio 2. Fixed Cost 3. Break Even Sales 4. Sales Required To Earn A Profit Of Rs 40,000. 5. Profit When Sales Are Rs 2,00,000,6. Marginal Of Safety In Period 1

Period	Sales	Profit
1	2,40,000	18,000
2	2,80,000	26,000

Solution

1. **P/V Ratio**

= Changes In Profit / Changes In Sales × 100

= 26,000 – 18,000 /2,80,000 – 2,40,000 × 100

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= 8,000 ×100 / 40,000 = 20%

2. **Fixed Cost**

Using On 1st Period = Contribution = Sales × P/V Ratio
= 2,40,000 × 20/ 100 = 48,000
Fixed Cost = Contribution – Profit = 48,000 – 18,000 = 30,000

3. **Break Even Sales :**

Fixed Cost = 30,000 = 1,50,000

P.V Ratio = 20%

4. **Sales Required To Earn A Profit Of Rs 40,000:**

Sales = Fixed Cost + Required Profit = 30,000 + 40,000

P.V Ratio 20%

= 70,000 = 1,50,000 = 20 %

5. **Profit When Sales Are Rs 2,00,000:**

Profit = Contribution – Fixed Cost

Contribution = Sales × P.V Ratio

= 2,00,000 × 20/100 = 40,000

Profit = Contribution – Fixed Cost

= 40,000 – 30,000 = 10,000

6. **Marginal Of Safety In Period 1:**

= Profit = 18,000 = 90,000

P.V Ratio 20%

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UNIT - V

CAPITAL BUDGETING

MEANINGOFCAPITAL BUDGETING:

Capital budgeting is the process of making investment decisions in capital expenditures. A capital expenditure may be defined as an expenditure the benefits of which are expected to be received over period of time exceeding one year. The main characteristic of a capital expenditure is that the expenditure is incurred at one point of time whereas benefits of the expenditure are realized at different points of time in future. In simple language we may say that a capital expenditure is an expenditure incurred for acquiring or improving the fixed assets, the benefits of which are expected to be received over a number of years in future. The following are some of the examples of capital expenditure:

NEEDANDIMPORTANCEOFCAPITAL BUDGETING:

i. Large Investments. Capital budgeting decisions, generally, involve large investmentoffunds.Butthefundsavailablewiththefirmarealwayslimited and the demand for funds far exceeds the resources. Hence, it is very important for a firm to plan and control its capital expenditure.

ii. Long-term Commitment of Funds. Capital expenditure involves not only large amount of funds but also funds for long-term or more or less on permanent basis. The long-term commitment of funds increases the financial risk involved in the investment decision. Grater the risk involved, greater is the need for careful planning of capital expenditure, i.e. Capital budgeting.

iii. Irreversible Nature. The capital expenditure decisions are of irreversible nature. Once the decision for acquiring a permanent asset is taken, it becomes very difficult to dispose of these assets without incurring heavy losses.

iv. Long-term Effect on Profitability. Capital budgeting decisions have a long-4erm and significant effect on the profitability of a concern. Not only the present earnings of the firm are affected by the investments in capital assets but also the future growth and profitability of the firm depends upon the investment decision taken today. An unwise decision may prove disastrous and fatal to the very existence of the concern. Capital budgeting is of utmost importance to avoid over investment or under investment in fixed assets.

v. Difficulties of Investment Decisions. The long term investment decisions are difficult to be taken because (I) decision extends to a series of years beyond the current accounting period, (ii) uncertainties of future and (iii) higher degree of risk.

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vi. National Importance. Investment decision though taken by individual concern is of national importance because it determines employment, economic activities and economic growth.

Thus, we may say that without using capital budgeting techniques a firm may involve itself in a losing project. Proper timing of purchase, replacement, expansion and alternation of assets is essential.

CAPITAL BUDGETING PROCESS:

Capital budgeting is a complex process as it involves decisions relating to the investment of current funds for the benefit to the achieved in future and the future is always uncertain. However, the following procedure may be adopted in the process of capital budgeting:

1. **Identification of Investment Proposals:** The capital budgeting process begins with the identification of investment proposals. The proposal or the idea about potential investment opportunities may originate from the top management or may come from the rank and file worker of any department or from any officer of the organization. The departmental head analyses the various proposals in the light of the corporate strategies and submits the suitable proposals to the Capital Expenditure Planning Committee in case of large organizations or to the officers concerned with the process of long-term investment decisions.

2. **Screening the Proposals:** The Expenditure Planning Committee screens the various us proposals received from different departments. The committee views these proposals from various angles to ensure that these are in accordance with the corporate strategies or selection criterion of the firm and also do not lead to departmental imbalances.

3. **Evaluation of Various Proposals:** The next step in the capital budgeting process is to evaluate the profitability of various proposals. There are many methods which may be used for this purpose such as payback period method, rate of return method, net present value method, internal rate of return method etc. All these methods of evaluating profitability of capital investment proposals have been discussed in detail separately in the following pages of this chapter.

It should, however, be noted that the various proposals to the evaluated may be classified as:

1. Independent proposals
2. Contingent or dependent proposals and
3. Mutually exclusive proposals.

Independent proposals are those which do not compete with one another and the same may be either accepted or rejected on the basis of a minimum return on investment required. The contingent proposals are those whose acceptance depends upon the acceptance of one or more other proposals, e.g., further investment in building or machineries may have to be undertaken as

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a result of expansion programme. Mutually exclusive proposal are those which compete with each other and one of those may have to be selected at the cost of the other.

Fixing Priorities:

After evaluating various proposals, the unprofitable or uneconomic proposals maybe rejected straight away. But it may not be possible for the firm to invest immediately in all the acceptable proposals due to limitation of funds. Hence, it is very essential to rank the various proposals and to establish priorities after considering urgency, risk and profitability involved therein.

Final Approval and Preparation of Capital Expenditure Budget:

Proposals meeting the evaluation and other criteria are finally approved to be included in the Capital Expenditure Budget. However, proposals involving smaller investment may be decided at the lower levels for expeditious action. The capital expenditure budget lays down the amount of estimated expenditure to be incurred on fixed assets during the budget period.

Implementing Proposal:

Preparation of a capital expenditure budgeting and incorporation of a particular proposal in the budget does not itself author is to go ahead with the implementation of the project. A request for authority to spend the amount should further be made to the Capital Expenditure Committee which may like to review the profitability of the project in the changed circumstances.

Further, while implementing the project, it is better to assign responsibilities for completing the project within the given time frame and cost limit so as to avoid unnecessary delays and cost over runs. Network techniques used in the project management such as PERT and CPM can also be applied to control and monitor the implementation of the projects.

Performance Review:

The last stage in the process of capital budgeting is the evaluation of the performance of the project. The evaluation is made through post completion audit by way of comparison of actual expenditure on the project with the budgeted one, and also by comparing the actual return from the investment with the anticipated return. The unfavourable variances, if any should be looked into and the causes of the same be identified so that corrective action may be taken in future.

METHODS OF CAPITAL BUDGETING OR EVALUATION OF INVESTMENT PROPOSALS:

At each point of time a business firm has a number of proposals regarding various projects in which it can invest funds. But the funds available with the firm are always limited and it is not possible to invest funds in all the proposals at a time. Hence, it is very essential to select from amongst the various competing proposals, those which give the highest benefits. The crux of the capital budgeting is the allocation of available resources to various proposals. There are many considerations, economic as well as non-economic, which influence the capital budgeting decisions. The crucial factor that influences the capital budgeting decision is the profitability of the

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prospective investment Yet the risk involved in the proposal cannot be ignored because profitability and risk are directly related, ie higher the profitability, the greater the risk and vice-versa.

There are many methods of evaluating profitability of capital investment proposals. The various commonly used methods are as follows:

A. Traditional methods:

1. Pay-back Period Method or Payout or Payoff Method
2. Improvement of Traditional Approach to Pay Back Period Method
3. Rate of Return Method or Accounting Method

B. Time-adjusted method or discounted Methods:

a. Net present Value Method.

b. Internal Rate of Return Method.

c. Profitability Index Method.

1. PAY-BACKPERIOD METHOD:

The 'Pay back' sometimes called as pay out or pay off period method represents the period in which the total investment in permanent assets pays back itself. This method is based on the principle mat every capital expenditure pays itself back within a certain period out of the additional earnings generated from the capital assets. Thus, it measures the period of time for the original cost of a project to be recovered from the additional earnings of the project itself. Under this method, various investments are ranked according to the length of their payback period in such a manner that the investment with a shorter payback period is preferred to the one which has longer pay back period.

In case of evaluation of a single project it is adopted if it pays back for itself within a period specified by the management and if the project does not pay back itself within the period specified by the management then it is rejected.

The pay-back period can be ascertained in the following manner:

a. Calculate annual net earnings (profits) before depreciation and after taxes; these are called annual cash inflows.

b. Divide the initial outlay(cost)of the project by the annual cash inflow, where the annual cash inflows (Profit before depreciation and after taxes) are unequal, the payback period can be found by adding up the cash inflows until the total is equal to the initial cash outlay of project or original cost of the asset.

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Illustration:

AprojectcostsRs.1,00,000 and yields anannualcashinflowofRs.20,000for8years. Calculate its pay-back period.

Solution:

The Pay-back period for the project is as follows:

Payback Period=Initial Outlay of the Project/Annual Cash Inflow

=100000/20000=5Years

Illustration:

Determine the pay-back period for a project which requires a cash outlay of Rs. 10,000 and generates cash inflows of Rs.2,000, Rs.4,000,Rs.3,000 and Rs.2,000 in the first, second ,third and fourth year respectively.

Solution:

Total Cash Outlay=Rs.10,000

TotalCashInflowforthefirst3years=Rs.2,000+4,000+3,000=Rs. 9,000

Up to the third year the total cost is not recovered but the total cash inflows for the four years are Rs.9,000+2,000= Rs. l1000 i.e. Rs. 1,000 more than the cost of the project. So the payback period is somewhere between 3 and 4 years. Assuming that the cash inflows occur evenly throughout the year, the time required to recover Rs. 1,000 will be 1,000/2,000)12=6 months.

Hencepaybackperiodis3yearsand6months.

Illustration:

AprojectcostRs.5,00,000 and yields annually a profit of Rs.80,000 after depreciation @ 12%p.a. but before tax of 50%. Calculate the Payback period.

Solution:

	Rs.
Profit before tax	80,000
Lesstax®50%	40,000
Profit after tax	40,000
Add back depreciation @12%on Rs.5,00,000	60,000
Profit before depreciation but after tax or Annual Cash In flow	1,00,000

Payback period=Cost of the Project/Annual Cash Inflow

=500000/ 100000 =5years.

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Advantages of Pay-back Period Method

1. The main advantage of this method is that it is simple to understand and easy to calculate.
2. It saves in cost, it requires lesser time and labour as compared to other methods of capital budgeting.
3. In this method, as a project with a shorter pay-back period is preferred to the one having a longer pay-back period, it reduces the loss through obsolescence and is more suited to the developing countries, like India, which are in the process of development and have quick obsolescence.
4. Due to its short-term approach, this method is particularly suited to a firm which has shortage of cash or whose liquidity position is not particularly good.
5. Disadvantages of Pay-back Method

Though pay-back period method is the simplest, oldest and most frequently used method, it suffers from the following limitations:

1. It does not take into account the cash inflows earned after the payback period and hence the true profitability of the projects cannot be correctly assessed.
2. This method ignores the time value of money and does not consider the magnitude and timing of cash inflows. In spite of the above-mentioned limitations, this method can be used in evaluating the profitability of short term and medium-term capital investment proposals.
3. It does not take into consideration the cost of capital which is a very important factor in making sound investment decisions.
4. It may be difficult to determine the minimum acceptable pay-back period, it is usually, a subjective decision.
5. It treats each asset individually in isolation with other assets which is not feasible in real practice.
6. Pay-back period method does not measure the true profitability of the project as the period considered under this method is limited to a short period only and not the full life of the asset.

RATE OF RETURN METHOD:

This method takes into account the earnings expected from the investment over their whole life. It is known as Accounting Rate of Return method for the reason that under this method, the accounting concept of profit (net profit after tax and depreciation) is used rather than cash inflows. According to this method, various projects are ranked, in order of the rate of earnings or rate of return. The project with the higher rate of return is selected as compared to

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the one with lower rate of return. This method can also be used to make decision as to accepting or rejecting a proposal. The expected return is determined and the project which has a higher rate of return than the minimum rate specified by the firm called the cut off rate, is accepted and the one which gives a lower expected rate of return than the minimum rate is rejected.

Average rate of return method:

Under this method average profit after tax and depreciation is calculated and then it is divided by the total capital outlay or total investment in the project. In the words, establishes the relationship between average annual profits to total investments.

Illustration:

A project requires an investment of Rs. 500000 and has a scrap value of Rs. 20000after five years. It is expected to yield profits after depreciation and taxes during the five years amounting to Rs. 40000, Rs. 60000, Rs. 70000, Rs. 50000 and Rs. 20000. Calculate the average rate of return on the investment

Solution:

Total profit = 40000 + 60000 +70000 + 50000 + 20000 = Rs.240000

Average profit =Rs.240000 /5= Rs.48000

Net Investment in the project = Rs.500000 –20000 (Scrap value) = Rs.480000. Average Rate of Return = Average Annual profit / Net Investment in the project X 100 = 48000/480000 X 100 =10%

Advantages of Rate of Return Method:

a. It is very simple to understand and easy to operate.

b. It uses the entire earnings of a project in calculating rate of return and not only the earnings up to pay-back period and hence gives a better view of profitability as compared to pay-back period method.

c. As this method is based upon accounting concept of profits, it can be readily calculated from the financial data.

Disadvantages of Rate of Return Method:

a. This method also like pay-back period method ignores the time value of money as the profits earned at different points of time are given equal weight by averaging the profits. It ignores the fact that a rupee earned today is of more value than a rupee earned an year after, or so.

b. It does not take into consideration the cash flows which are more important than the accounting profits.

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c. It ignores the period in which the profits are earned as a 20% rate of return in 272 years may be considered to be better than 18% rate of return for 12 years. This is not proper because longer the term of the project, greater is the risk involved.

d. This method cannot be applied to a situation where investment in a project is to be made in parts.

TIME-ADJUSTED OR DISCOUNTED CASH FLOW METHODS:

The traditional methods of capital budgeting i.e. pay-back method as well as accounting rate of return method, suffer from the serious limitations that give equal weight to present and future flow of incomes. These methods do not take into consideration the time value of money, the fact that a rupee earned today has more value than a rupee earned after five years. The time-adjusted or discounted cash flow methods take into account the profitability and also the time value of money. These methods also called modern methods of capital budgeting are becoming increasingly popular day by day. Following are the discounted cash flow methods;

NET PRESENT VALUE METHOD

The net present value method is a modern method of evaluating investment proposals. This method takes into consideration the time value of money and attempts to calculate the return on investments by introducing the factor of time element. It recognizes the fact that a rupee earned today is worth more than the same rupee earned tomorrow. The net present values of all inflows and outflows of cash occurring during the entire life of the project is determined separately for each year by discounting these flows by the firm's cost of capital or a pre-determined rate. The following are the necessary steps to be followed for adopting the net present value method of evaluating investment proposals:

1. First of all determine an appropriate rate of interest that should be selected as the minimum required rate of return called 'cut -off rate or discount rate. The rate should be a minimum rate of return below which the investor considers that it does not pay him to invest. The discount rate should be either the actual rate of interesting the market on long-term loans or it should reflect the opportunity cost to capital of the investor.

2. Compute the present value of total investment outlay, i.e. cash outflows at the determined discount rate. If the total investment is to be made in the initial year, the present value shall be the same as the cost of investment.

3. Compute the present values of total investment proceeds, i.e., cash inflows, (profit before depreciation and after tax) at the above determined discount rate.

4. Calculate the net present value of each project by subtracting the present value of cash inflows from the present value of cash outflows for each project.

5. If the net present value is positive or zero, i.e., when present value of cash inflows either exceeds or is equal to the present values of cash outflows, the proposal may be accepted.

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But in case the present value of inflows is less than the present value of cash outflows, the proposal should be rejected.

6. To select between mutually exclusive projects, projects should be ranked in order of net present values, i.e. the first preference should be given to the project having the maximum positive net present value.

For clear understanding, a portion of the table is reproduced below:

PRESENT VALUE TABLE

(Present value of Re l payable or receivable Annually for N years)

Year	8%	10%	12%	14%	15%	20%
01	0.92593	0.90909	0.89286	0.87719	0.86957	0.83333
02	.85734	.82654	.79719	.76947	.75614	.69444
03	.79383	.75131	.71178	.67497	.65752	.57870
04	.73503	.68301	.63552	.59208	.57175	.48225
05	.68058	.62092	.56743	.51937	.49718	.40188
06	.63017	.56447	.50663	.45559	.43233	.33490
07	.58349	.51361	.45305	.39964	.37594	.27908
08	.54027	.46651	.40388	35056	.32690	.23257
09	.50025.	42410	.36061	.30874	.28426	.19381
10	.46319	.38554	.32197	.26974	.24718	.16151

Illustration:

Calculate the net present value from the following data:

Cost of machine estimated life cost of capital	**Rs.80,000 5 years 10%**
Net cash flow at the end of:	
Year1	30,000
Year2	35,000
Year3	50,000
Year4	40,000
Year5	45,000

SOLUTION:

Year	Cash flow	PV factor @ 10%	Present value @ 10%
1	30,000	0.909	27,270
2	35,000	0.826	28,910
3	50,000	0.751	37,550
4	40,000	0.683	27,320
5	45,000	0.621	27,945
	Total present value of inflow cash		1,48,995
	Less: Cash out flow		80,000

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Net present value	68,995

Advantages of the Net Present Value Method:

The advantages of the net present value method of evaluating investment proposals areas follows:

a. It recognizes the time value of money and suitable to be applied in a situation with uniform cash outflows and uneven cash inflows or cash flows at different periods of time.

b. It takes into account the earnings over the entire life of the project and the true profitability of the investment proposal can be evaluated.

c. It takes into consideration the objective of maximum profitability.

Disadvantages of the Net Present Value Method:

The net present value method suffers from the following limitations:

a. As compared to the traditional methods, the net present value method is more difficult to understand and operate.

b. It may not give good results while comparing projects with unequal lives as the project having higher net present value but realized in a longer life span may not be as desirable as a project having something lesser net present value achieved in a much shorter span of life of the asset.

c. In the same way as above, it may not give good results while comparing projects with unequal investment of funds.

d. It is not easy to determine an appropriated is count rate.

INTERNAL RATE OF RETURN METHOD:

The internal rate of return method is also a modern technique of capital budgeting that takes into account the time value of money. It is also known as 'time adjusted rate of return' discounted cash flow'' discounted rate of return,' 'yield method,' and 'trial and error yield method'. In the net present value method the net present value is determined by discounting the future cash flows of a-project at a predetermined or specified rate called the cut-off rate. But under the internal an rate of return method, the cash flows of a project are discounted at a suitable rate by hit and trial method, which equates the net present value so calculated to the amount of the investment. Under this method, since the discount rate is determined internally, this method is called as the internal rate of return method. The internal rate of return can be defined as that rate of discount at which the present value of cash-inflows is equal to the present value of cash outflows. It can be determined with the help of the following mathematical formula.

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Where,

C= Initial Outlay at time Zero.

A1,A2,A3….An=Futurenetcashflowsatdifferentperiods.2,3…=numberofyears r = rate of discount of internal rate of return.

The internal rate of return can also be determined with the help of present value tables.

The following steps are required to practice the internal rate of return method.

a. Determine the future net cash flows during the entire economic life of the project. The cash inflows are estimated for future profits before depreciation but after taxes.

b. Determine the rate of discount at which the value of cash inflows is equal to the present value of cash outflows. This may be determined as explained after step (4).

c. Accept the proposal if the internal rate of return is higher than or equal to the minimum required rate of return, i.e. the cost of capital or cut off rate and reject the proposal if the internal rate of return is lower than the cost of cut-off rate.

d. In case of alternative proposals select the proposal with the highest rate of return as long as the rates are higher than the cost of capital or cut-off-rate.

DETERMINATION OF INTERNAL RATE OF RETURN (IRR):

When the annual net cash flows are equal over the life of the asset: Firstly, find out present value factor by dividing initial outlay (cost of the investment) by annual cash flow.

Illustration:

Initial OutlayRs.50,000

Life of the asset 5years

Estimated Annual Cash-flow Rs.12,500 Calculate the internal rate of return.

Solution:

Present Value Factor=Initial outlay/Annual Cash Flow

=50,000/12500 =4

Consulting Present Value Annuity tables for 5 years periods at Present Value Factor of 4, Internal Rate of Return = 8% Approx.

When the annual cash flows are unequal over the life of the asset:

In case annual cash flows are unequal over the life of the asset, the internal rate of return cannot be determined according to the technique suggested above. In such cases, the internal rate of return is calculated by hit and trial and that is why this method is also known as hit and

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trial yield method. We may start with any assumed discount rate and find out the total present value of cash outflows which is equal to the cost of the initial investment where total investment is to be made in the beginning. The rate, at which the total present value of all cash inflows equals the initial outlay, is the internal rate of return. Several discount rates may have to be tried until the appropriate rate is found.

The calculation process may be summed up as follows:

1. Prepare the cash flow table using an arbitrary assumed discount rate to discount the net cash flows to the present value.
2. Find out the Net Present Value by deducting from the present value of total cash flows calculated in (i) above the initial cost of the investment.
3. If the Net Present Value (NPV)is positive, apply higher rate of discount.
4. If the higher discount rates till gives a positive net present value, increase the discount rate further until the NPV becomes negative.
5. If the NPV is negative at this higher rate, the internal rate of return must be between these two rates:

Illustration:

Initial Investment Rs.60000 Life of the Asset 4 years

Estimated Net Annual Cash Flows: Rs.

1stYear	15000
2ndYear	20000
3rdYear	30000
4th Year	20000

Calculate Internal Rate of Return

Solution:

CashFlowTableatVariousAssumedDiscountRatesof10%12%14%&15%

Year Annual

Cash Discount rate

10% Discount rate

12% Discount rate

14% Discount rate

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15%

	Flow Rs.	P.V.F.P.V. Rs.	P.V.F.P.V. Rs.	P.V.F.P.V. Rs.	P.V.F.P.V. Rs.
1.	15.000.909	13,635.892	13,380.877	13,155.869	13,035
2.	20,000.826	16,520.797	15,940.769	15,380.756	15,120
3.	30,000.751	22,530.711	21,330.674	20,220.657	19,710
4.	20,000.683	13,660.635	12,700.592	11,840.571	11,420
		66,345	63,350	60,595	59,285

The present value of net cash flows at 14% rate of discount is Rs.60,595 and at 15% rate of discount it is Rs. 59,285. So die initial cost of investment which is Rs. 60,000 falls in between these two discount rates. At 14% the NPV is + 595 but at 15% the NPV is -715, we may say that

IRR=14%+ 595/595+715 X (15%-14%) = 14.45%.

Advantages of Internal Rate of Return Method:

The internal rate of return method has the following advantages:

a. Like the net present value method, it takes into account the time value of money and can be usefully applied in situations with even as well as un even cash flow at different periods of time.

b. It considers the profitability of the project for its entire economic life and hence enables evaluation of true profitability.

c. The determination of cost of capital is not a prerequisite for the use of this method and hence it is better than net present value method where the cost of capital cannot be determined easily.

d. It provides for uniform ranking of various proposals due to the percentage rate of return.

e. This method is also compatible with the objective of maximum profitability and is considered to be a more reliable technique of capital budgeting.

Disadvantages of Internal Rate of Return Method

In spite of so many advantages, it suffers from the following drawbacks:

a. It is difficult to understand and is the most difficult method of evaluation of investment proposals.

b. This method is based upon the assumption that the earnings are reinvested at the internal rate of return for the remaining life of the project, which is not a justified assumption particularly when the average rate of return earned by the firm is not close to the internal

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rate of return. In this sense, Net Present Value method seems to be better as it assumes that the earnings are reinvested at the rate of firm's cost of capital.

c. The results of NPV method and IRR method may differ when the projects under evaluation differ in their size, life and timings of cash flows.

PROFITABILITY INDEX METHOD OR BENEFIT COST RATIO:

It is also a time -adjusted method of evaluating the investment proposals. Profitability index also called as Benefit-Cost Ratio (B/C) or 'Desirability factor' is the relationship between present value of cash inflows and the present value of cash outflows. Thus The net profitability index can also be found as Profitability Index (gross) minus one.

The proposal is accepted if the profitability index is more than one and is rejected in case the profitability index is less than one. The various projects are ranked under this method in order of their profitability index,-in such a manner that one with higher profitability index is ranked higher than the other with lower profitability index.

Advantages and Disadvantages of Profitability Index Method:

The method is a slight modification of the Net Present Value Method. The net present value method has one major drawback that it is not easy to rank projects on the basis of this method particularly when the costs of the projects differ significantly. To evaluate such projects, the profitability index method is most suitable. The other advantages and disadvantages of this method are the same as those of net present value method.

Illustration:

The initial cash outlay of a project is Rs. 50,000 and it generates cash inflows of Rs. 20,000, Rs. 15,000 Rs.25,000 and Rs. 10,000 in four years. Using present value index method, appraise profitability of the proposed investment assuming 10% rate of discount.

Solution:

Calculations of Present Values Index and Profitability

Year	Cash inflows	Present value
1.	20,000.909	18,180
2.	15,000.826	12,390
3.	25.000.751	18,775
4.	10,000.683	6.830
		56,175 Rs.

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Total Present Value	56,175
Less: Initial Outlay	50,000
Net Present Value	6,175

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Profit ably Index (gross)=Present Value of Cash Inflows / InitialCashOutlay
= 56712/50000= 1.1235

As the P.Iishigherthan1,the proposal can be accepted

Net Profitability Index=NPV/ Initial Cash Outlay
= 6175/ 50,000 = .1235
or N.P.I.= 1.1235-1=0.1235.

At the net profitability index is positive, The proposal can be accepted.

COMPARISON BETWEEN NPV AND IRR(NPV Vs. IRR):

The Net Present Value Method and the Internal Rate of Return Method are similar in the sense that both are modem techniques of capital budgeting and both take into account the time value of money. In fact, both these methods are discounted cash flow techniques. However, there are certain basic differences between these two methods of capital budgeting:

1. In the net present value method, the present value is determined by discounting the future cash flows of a project at a predetermined or specified rate called the cut off rate based on cost of capital. But under the internal rate of return method, the cash flows are discounted at a suitable rate by hit and trial method which equates the present value so calculated to the amount of the investment. Under IRR method, discount rate is not predetermined or known as is the case in NPV method.
2. The NPV method recognizes the importance of market rate of interest or cost of capital. It arrives at the amount to be invested in a given project so that its anticipated earnings would recover the amount invested in the project at market rate. Contrary to this, the IRR method does not consider the market rate of interest and seeks to determine the maximum rate of interest at which funds invested in any project could be repaid with the earnings generated by the project
3. The basic presumption of NPV method is that intermediate cash inflows are reinvested at the cut off rate, whereas, in the case of IRR method, intermediate cash flows are presumed to be reinvested at the internal rate of return.
4. The results shown by NPV method are similar to that of IRR method under certain situations, whereas, the two give contradictory results under some other circumstances. However, it must be remembered that NPV method using a predetermined cut -off rate is more reliable than the IRR method for ranking two or more capital investment proposals.

Illustration:

A firm whose cost of capital is 10% is considering two mutually exclusive projects X and Y the cash flows of which are given as follows

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Year	Project X	Project Y
0	-100000	-70000
1	8000060000	
2	8000060000	

Suggest which project should be taken up using: a) Net present value method b) Profitability Index method

Solution:

Year	P.V. Factor	at10% Project X		Project Y	
		Cash flow(Rs.)	Present Value(Rs.)	Cash Flow(Rs.)	Present Value(Rs.)
0	1	-1,00,000	-1,00,000	-70,000	-70,000
1	.909	80,000	72,720	60,000	5440
2	.826	80,000	66080	60,000	49,560

Net Present Value (NPV)	38,800	34,100
Profitability Index (PI)=	138,800/	1,04,100/
Present value of cash	1,00,000	70.000

Inflows / Present value of cash=1.39 =1.49 Outflows

Suggestion: According to Net Present Value method project X is acceptable because of its higher

Illustration:(Pay Back Period Method):

Moon Ltd. is producing articles mostly by manual labour and is considering to replace it a new machine. There are two alternative models M and N of the new machine. Prepare a statement of liability showing the payback period from the following information:

Machine M	Machine N	5years
Estimated life of machine	4years	
Cost of machine	Rs 90,000	Rs 1,80,000
Estimated savings in scrap	5,000	8,000
Estimated savings indirect		80,000
Wages 60,000		

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Additional cost of maintenance 8,000	10,000	
Additional cost of Supervision 12,000	18,000	

Solution

Estimated savings per	Machine M[Rs]	Machine N[Rs]
Annum	5000	8000
Scrap		
Direct wages	60000	80000
Total savings[a]	65000	88000
Additional cost per annum		
Maintenance	8000	10000
Supervision	12000	18000
Total additional cost[b]	20000	28000
Net savings or annual cash inflows[a-b]	45000	60000
Pay back period =initially Outlay of the project/ annual cash inflow	90000/45000=2years	180000/60000=3years

As payback period in case of machine M is less than that in case of machine N, machine M is recommended.

Note. Tax has been ignored as the rate of tax has not been given.

ADVANTAGES OF PAYBACK PERIOD METHOD:

The main advantage of method is that it is simple to understand and easy to calculate. It saves in cost, it requires lesser time and labour as compared to other methods of capital budgeting.

DISADVANTAGES:

It ignores time value of money. It doesn‘t take into account cost of capital.

Illustration:(Average Rate of Return Method)

Calculate the average rate of return for projects A and B from the following

Project A Project B

Investments Rs. 20000Rs 30000

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Expected life

[no salvage value]4years 5years

Projected net income

[after interest, depreciation and taxes]

Years	Project A Rs	Project B Rs
1	2000	3000
2	1500	3000
3	1500	2000
4	1000	1000
5		1000
	6000	10000

Iftherequiredrateofreturnis12percentwhichprojectshouldbeundertaken.

SOLUTION:

Total Profit Project A Rs. Project [after, depreciation, interest and taxes]

6000 10000

Average profit 6000/4=150010000/4=2000

Net investment on the

Project 20000 30000

Average rate of return 1500/20000*1002000/30000*100

Average annual profit/net

investment

*100 7.5percent 6.66percent

But if we calculate rate of return on average investment which is initial investment divided by 2 then average investment or

Average investment 20000/2 =10000

30000/2=15000

Average return on

Investment 1500/10000*100

2000/15000*100

Investment 15percent 13.33percent

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The average return on average investment is higher in case of project A and is also higher than the required rate of return of 12percent and hence project A is suggested to be undertaken.

Illustration:(Pay Back, Net Present Value, Profitability Index And IRR)

A company has an investment opportunity costing Rs 40000 with the following expected net cash flow after taxes and before depreciation.

Years	Net cash flow Rs
1	7000
2	7000
3	7000
4	7000
5	7000
6	8000
7	10000
8	15000
9	10000
10	4000

Using10 percent as the cost of capital, determine the following

a) pay back period
b) netpresentvalueat10percentdiscountfactor
c) profitabilityindexat10percentdiscountfactor
d) internalrateofreturnwiththehelpof10percentand15percentdiscountfactor

Note

Year	PresentvalueofRe1at 10 percent discount	Present value of Re1 at 15 percent discount rate
1	0.909	0.870
2	0.826	0.756
3	0.751	0.658
4	0.683	0.572
5	0.621	0.497
6	0.564	0.432
7	0.513	0.376
8	0.467	0.327
9	0.424	0.284
10	0.386	0.247

Solution:

[A]CALCULATIONOFPAYBACKPERIOD	40000
Cash out lay of the project	
Total cash inflow for the first five years	35000
Balance of cash outlay left to be paid back in the 6th year	5000
Cashinflowfor6thyear	8000

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So thepaybackperiodisbetween5thand 6th years

5years+5000/8000=5*5/8

[B]CALCULATIONOFNETPRESENTVALUEAT10PERCENTDISCOUNTRATE

Year [col1]	Net cash inflow[col2] Rs	Present value at discount rate
1	7000	0.9096363
2	7000	0.8265782
3	7000	0.7515257
4	7000	0.6834781
5	7000	0.6214347
6	8000	0.5644512
7	10000	0.5135130
8	15000	0.4677005
9	10000	0.4244240
10	4000	0.3861544
Total	48961	

Net present value=present value of inflow – cost of the investment

=Rs48961-40000=8961

[C]CALCULATION OF PROFIT ABILITY INDEX @ 10% DISCOUNT RATE

[D]CALCULATION OF INTERNAL RATE OF RETURN

As the net present value [calculate in [b]above] is positive, we must calculate net present value at a higher rate of discount i.e. 15 percent as given

Year	Net cash in flow Rs	Present value at discount rate of 15%	Present value Rs
1	7000	6090	0.870
2	7000	5292	0.756
3	7000	4606	0.658
4	7000	4004	0.572
5	7000	3479	0.497
6	8000	3456	0.432

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7	10000	3760	0.376
8	15000	4905	0.327
9	10000	2840	0.284
10	4000	988	0.247
		Total:39420	

Netpresentvalueat15percent=39420-40000=-58

As the netpresentvalueat15percentiscountrateisnegative

Hence internal rate of return fall inbetween10 percentand15 percent. The correct internal Rate of return can be calculated as follows

10percent+positiveNPVat10percent/PVat10percent –PVat15 percent *[15 percent-10 percent]

=10percent+8961/48961-39420*5percent

=10percent+8961/9541*5/100

=10percent+ 4.7 percent

=14.7 percent

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