COST ACCOUNTING - IV

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Preface

It is a matter of great pleasure to present this new edition of the book on ***Cost Accounting - IV*** to the students and professors of B.Com. (Accounting and Finance), Semester VI, University of Mumbai. This book is written on lines of syllabus instituted by the Mumbai University. The book presents the subject matter in a simple and convincing language.

We owe a great many thanks to a great many people who helped and supported us during the writing of this book which includes Principals, Professors and Students of M.Com. Section.

The syllabus contains a list of the topics covered in each chapter which will avoid the controversies regarding the exact scope of the syllabus. The text follows the term-wise, chapter-topic pattern as prescribed in the syllabus. We have preferred to give the text of the section and rules as it is and thereafter added the comments with the intention of explaining the subject to the students in a simplified language. While making an attempt to explain in a simplified language, any mistake of interpretation might have crept in.

This book is an unique presentation of subject matter in an orderly manner. This is a student-friendly book and tutor at home. We hope the teaching faculty and the student community will find this book of great use. We welcome constructive suggestions for improvement.

We are extremely grateful to Shri K.N. Pandey of Himalaya Publishing House Pvt. Ltd. for their devoted and untiring personal attention accorded by them to this publication. We gratefully acknowledge and express our sincere thanks to the following people without whose inspiration and support, constructive suggestions of this book would not have been possible.

- ***Mr. Jitendra Singh Thakur (Trustee, Thakur College)***
- ***Dr. Chaitaly Chakraborty (Principal, Thakur College)***
- ***Mrs. Janki Nishikant Jha***

Authors

Syllabus

Modules at a Glance

Sr. No.	Modules	No. of Lectures
1	Budgeting and Budgetary Control	15
2	Absorption Costing and Marginal Costing, Cost Volume and Profit Analysis	15
3	Managerial Decision Making	15
4	Standard Costing and Variance Analysis	15
	Total	**60**

Module	Topics
1	**Budgeting and Budgetary Control** Meaning and Objectives, Advantages and Limitations of Budgets Functional Budgets, Fixed and Flexible Budgets Zero Based Budgeting, Performance Budgeting *Simple practical problems of preparing flexible budgets and functional budgets*
2	**Absorption Costing and Marginal Costing, Cost Volume and Profit Analysis** **Absorption Costing and Marginal Costing** Meaning of Absorption Costing Introduction to Marginal Costing Distinction between Absorption Costing and Marginal Costing Advantages and Limitations of Marginal Costing **Cost Volume and Profit Analysis** Break-even Analysis – Meaning and Graphic Presentation Margin of Safety Key Factor *Simple practical problems based on using the marginal costing formulae*
3	**Managerial Decision Making** Make or Buy Sales Mix Decisions

	Exploring New Markets Plant Shut Down Decision *Simple practical problems*
4	**Standard Costing and Variance Analysis** Preliminaries in Installing of a Standard Cost System Material Cost Variance Labour Cost Variance Variable Overhead Variances Fixed Overhead Variances Sales Variances *Simple practical problems*

Paper Pattern

Credit Based Evaluation System

Scheme of Examination

(a) Semester End Examination **75 Marks**

Q. No.	Particulars	Marks
Q.1	Objective Questions* (A) Sub-questions to be asked (10) and to be answered (any 8) (B) Sub-questions to be asked (10) and to be answered (any 7) (*Multiple Choice/True or False/Match the Columns/Fill in the Blanks)	15
Q.2	Full Length Practical Question **OR**	15
Q.2	Full Length Practical Question	15
Q.3	Full Length Practical Question **OR**	15
Q.3	Full Length Practical Question	15
Q.4	Full Length Practical Question **OR**	15
Q.4	Full Length Practical Question	15
Q.5	(A) Theory Questions (B) Theory Questions **OR**	8 7
Q.5	Short Notes To be asked (05), To be answered (03)	15

Note: Practical question of 15 Marks may be divided into two sub-questions of 7/8 and 10/5 Marks. If the topic demands, instead of practical questions, appropriate theory question may be asked.

(b) Internal of Assessment **25 Marks**

1. One Class Test (20 Marks)
   - Match the Column/Fill in the Blanks/Multiple Choice Questions (½ Mark each) 05 Marks
   - Answer in One or Two Lines (Concept-based Questions) (01 Mark each) 05 Marks
   - Answer in Brief (Attempt Any Two of the Three) (05 Marks each) 10 Marks
2. Active participation in routine class instructional deliveries and overall conduct as a responsible learner, mannerism and articulation and exhibit of leadership qualities in organizing related academic activities. 05 Marks

Contents

Chapter
1

BUDGETING AND BUDGETARY CONTROL

Introduction

Basically, management is the co-ordination of human effort, i.e., the accomplishment of goals by utilising the efforts of other people. Management is termed efficient if it accomplishes the objectives with minimum effort and costs. Management planning and control has been recognised as one of the most important approaches for facilitating effective performance of the management process.

While all business endeavours have multiple objectives of profit and contribution to the economic and social improvement, non-business endeavours have relatively precise objectives generally to be accomplished within specified cost constraints. Whether it is a business or non-business endeavour it is essential that the management and other interested parties are very well acquainted with the objectives and goals so that proper managerial guidance could be given and the effectiveness with which the desired activities are performed could be measured.

So, whatever be the endeavour, the management process essentially conforms to the general pattern – planning, co-ordination and control. With the increasing competition among profit making enterprises, the concept of profit planning and control system has gained wide acceptance which requires management to design its course in advance and use appropriate techniques to assure co-ordination and control of operations.

Elements of Management Planning and Control System

Management planning and control means the development and acceptance of objectives and goals and moving an organisation efficiently to achieve the desired objectives and goals. It is not a separate technique but entails an integration of all the functional and operational aspects of an enterprise.

Although management planning and control is related to accounting, it is a management system which comprises of activities of planning, co-ordination and control. For long-range success the stream of managerial decisions must generate plans and actions to provide the essential inflows that are necessary to support the planned outflows of the enterprise so that realistic profit and return on investment are earned. The relationship between these activities of the management can be seen in the Figure 1.1.

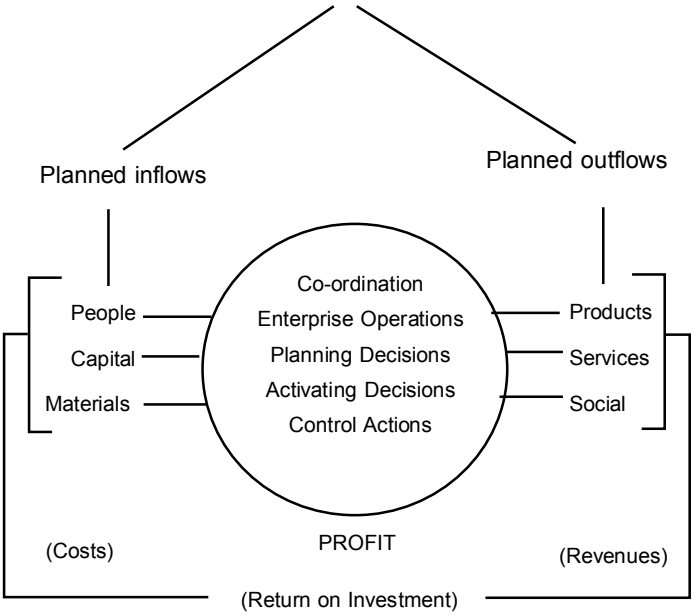

Figure 1.1: Planning and Controlling Inflows and Outflows for Profit

It may be noted that planned inflows are people, capital and materials, generally cost-incurring factors while outflows are products, services and social contributions that the enterprise generates which are generally revenue-generating factors. The responsibility of management is to manipulate, through the management process, i.e., planning, activating (or co-ordinating) and control the combinations of inflows and outflows so that the long-range objectives of the enterprise generally in terms of profit and return on investment are attained.

Planning

Planning has been defined as the design of a desired future state for an entity and rests on the belief that the future state can be attained by continuous management action. Thus, it projects the effective ways of attaining this desired future state, and presupposes that an entity can be more successful, in terms of its broad objectives, because of planned management decisions than it can if there were no planned intervention by the management.

The purpose of planning is to provide the managers with the guidelines for making decisions on a day-to-day basis. Planning referred here, is a decision-making process of highest order and thus requires management time and dedication. It starts with an attempt to project the future state without any intervention by the management and the desired state of the entity. Then, it concludes with a planning projection and thus, projects the ways to attain the desired future state realistically.

Planning is a continuous process since it requires constant revisions with changing conditions.

Control

Control may be defined simply as the action necessary to assure that objectives, plan, policies and strategies are being attained. It rests upon a firm foundation of management planning and thus, believes that the objectives, plans, policies and strategies are properly planned and communicated to those managers who are responsible for their accomplishment.

Generally, a control process encompasses the following:

1. Measuring performance against predetermined objectives and standards.
2. Communicating to the appropriate managers of the results.
3. Calculating deviations from the set objectives and standards.
4. Framing all possible alternative ways to correct the indicated variances.
5. Choosing and implementating the most promising alternative.
6. Appraising the corrective action and improve future planning and control cycles.

Control is effective if it is exercised at the point of action or at the time of commitment rather than after the completion of the action. This implies that the objectives, plans, policies and standards are communicated to and understood by the managers who are responsible for certain actions, so that they would be in a position to exercise control at the point of action.

In control process, evaluation of an actual result must be based upon some standard of performance. Current actual results can be compared to the actual results of the prior period. In this way, trends are revealed. However, comparison with prior period actual results may not provide effective measurement of performance due to the following reasons – (1) conditions may have changed (2) accounting classifications adopted may be different, and (3) performance in the prior period itself would have been unsatisfactory. Thus, the management has to evaluate the performance of various managers after taking into consideration the above points.

Co-ordination

Though Co-ordination is listed as a separate function of management, it should be viewed as an effect that ensues when the managerial functions of planning and controlling are accomplished.

Co-ordination is the synchronisation of individual actions with the result that each subdivision of an entity effectively works toward the common objectives. Co-ordination is regarded as one of the central tasks of management as it involves a reconciliation of differences in effort, timing, policies and aggregation of resources. Lack of co-ordination in an enterprise is observed when a department head is permitted to expand the department on the specific needs of that department only, although such expansion may negatively affect other departments and alter their performances. Thus, co-ordination is required at all vertical levels and on a horizontal basis.

The process of management planning and control system is summarised in the Figure 1.2.

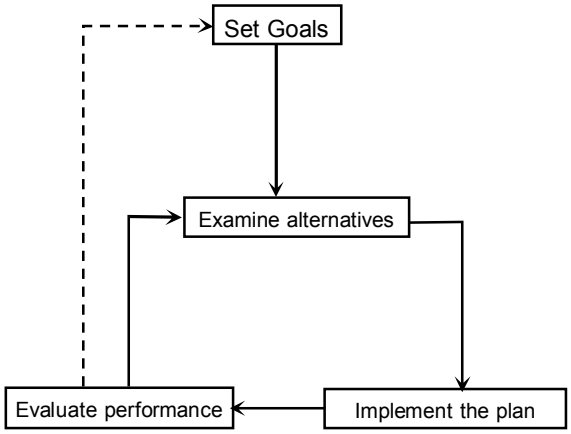

Figure 1.2

Role of Accounting Information

As already said, management planning and control system is related to accounting system. Let us see how this information enters into planning and control process.

Suitable goals are set based on the information provided by the accountants. Projections of future sales, expenses, incomes [and estimation of profits are made] depending on the accounting information.

After setting goals while examining alternatives, information about these alternatives comes from accounting system and the accountant is made to combine the data and produce meaningful reports.

Though, implementation of chosen alternative is done by the managers alone without the intervention of accounting system, the accountant is required to collect and summarise data about the success of the chosen plan. The evaluation of performance depends heavily on the facts that the accountant accumulates and reports.

The flowchart in Figure 1.3 summarises the planning-control cycle and the part played by the accountants and other information providers.

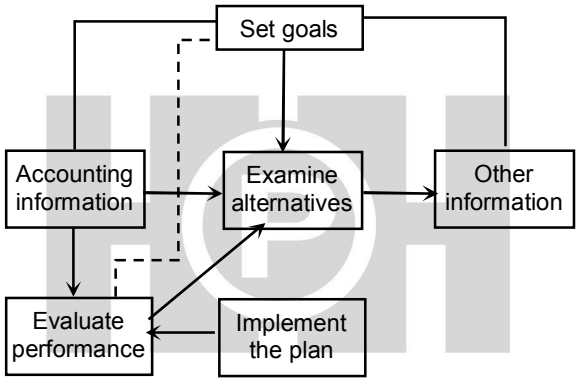

Figure 1.3

Though, accounting system is helpful in the process of planning and control it should be emphasised that the accountant does not necessarily participate in the management, and that his information may not necessarily prove that the success or failure has been achieved or suffered.

Budgeting as a Tool of Management Planning and Control

Budget is a numeric representation of the manager's plans for a specified period of time. It is commonly used by business firms, governmental agencies, non-profit organisations and even households. While there is considerable variation in the scope, degree of formality and level of sophistication applied to budgeting, most of the well managed business firms use budget which is a comprehensive and co-ordinated plan for the operations and resources of the firm.

A Budget can serve as an extremely useful tool for all managers.

(i) Communication: A budget can serve as a means of communicating information within a firm. It is especially useful to lower level managers. For example, the district sales managers can know from the budget the level of sales that are expected of them or the production manager can know through the budget how much he can spend towards labour

expenses, etc. The budget serves as a communicator over time. As everyone tends to forget what they have planned without a written record, budget will remind them of their goals and progress towards the goals.

(ii) Co-ordination: Whenever a manager is faced with managing two or more interrelated processes, he encounters the need to co-ordinate operations to maximise the utilisation of the available resources and to minimise idleness. A manager of a small manufacturing concern needs to co-ordinate such things as raw material purchases, working capital matter, labour union negotiations, etc. As the size of the operations increases, the number of factors to be co-ordinated increase and the manager is likely to find himself in a precarious situation without a concretely stated central plan. Co-ordination is essential when responsibility for different segments is delegated to separate individuals. The budget can serve for the above purpose of co-ordination.

(iii) Measurement of Success: Success is determined by comparing past performance against a previous period's performance. However, this comparison using historical records does not take into consideration the changes that take place for example, the market for the product may have increased, etc. Whereas, budgets provides us to compare the actual performance with the budgeted performance which is an estimate of 'what might have been' taking all the possible changes into account. Though budget is only a prior estimate of future conditions and thus subject to manipulation, it can be used as a success criterion, if done carefully and with additional data.

(iv) Motivation: Budgets prepared for the coming year motivates the managers to do their best. And, if a reward system is attached to the budget it further motivates the managers to achieve the levels of output.

Application of the Budget

In the following areas, budgeting can be applied.

Outputs

Careful analysis of future sales will be made. Then the manager will begin to plan production or purchase requirements to meet the expected sales figure. With the budgets prepared he would be in a position to utilise the available resources efficiently to meet the anticipated demand.

Inputs

Once the Budget establishes a manufacturing firm's output requirements, the manager can go about planning for labour and materials acquisition to support the desired output levels. Budgets help the managers to plan in advance for future and negotiate labour and material contracts at favourable rates. Without budget he may be forced into emergency purchases at higher costs, less skilled or overtime skilled labour and sometimes he may have to face with no production situation because of shortage of input. Budget helps managers to avoid off season layoffs and peak period bulges by spreading production more evenly through the year.

Facilities

Good budgeting also informs the manager about the adequacy of existing facilities for his future needs. However, this approach will require additional storage of materials and finished products and hence more space. Increased inventory costs leads to increased non-cash working capital and hence

cash may be borrowed until sales can be made. Thus, budgeting facilitates the above anticipations and assists in establishing co-ordination. Production of some materials needs special equipment, the need of which can be anticipated by budgeting and can be procured at favourable terms instead of a rush rental.

Administration

Budgeting applies equally well to administrative activities. Needs for clerks, storekeepers, book-keepers, secretaries, office supplies, etc., can be handled in the similar fashion through foresight and planning. Anticipation can lead to efficiency and higher profits in the office as well as in the production.

Cash Needs

Budgeting provides estimation of future receipts and disbursements. Careful planning facilitates the treasurer to minimise the chances of running out of cash and go bankrupt and also avoids situations of excess cash which is not capable of earning income.

Control

A well-structured budget can lead to efficient control of the firm as the manager has an indication of what should be done and can more easily spot what is being ineffectively done.

Organisation of the Budget

The following guidelines may be followed in preparing a budget.

Assigning personnel: The manager of an entity should assign his most qualified personnel to the preparation of the budget. The organisation chart that is generally found in medium sized firms is shown in Figure 1.4.

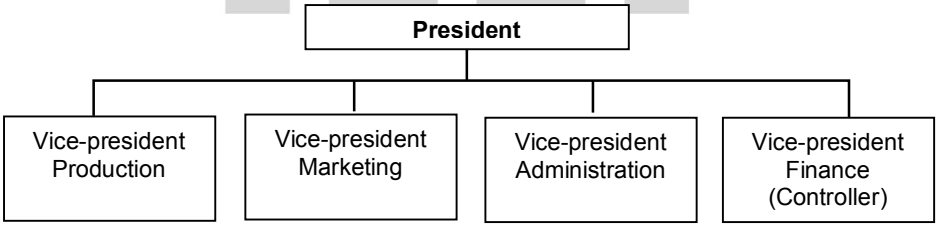

Figure 1.4

The four vice-presidents have responsibility for their respective functional areas. Each will delegate authority to his subordinates in order to get work done. Though, the Vice-president for finance provides information required by other departments, he makes decisions concerning the operation of his own department only.

A better course of action is to establish a budget committee with representation from each of the financial areas. A Budget Committee usually reports directly to top management. In large companies the budget committee is composed of executives in-charge of major functions of the business and includes the sales manager, personnel manager, finance manager, the production manager, the chief engineer, the treasurer and the chief accounts officer. One member of the budget committee is the budget director who is in-charge of preparing a budget manual of instructions and accumulating the

proposed budget data. In large companies, the position may be full-time job; in smaller companies, the post may be assigned to the finance manager or chief accounts officer or some other officer who acts as budget director on a part-time basis.

The principal functions of the budget committee are to:

- Decide the company's general policies and objectives;
- Receive and review individual budget estimates concerning different departments/units/ division;
- Suggest changes, modifications in accordance with organisational objectives;
- Approve budgets which act as an authority/target for departmental action;
- Receive and analyse performance reports regarding the implementation of budgets;
- Suggest corrective action to improve efficiency and achieve budgetary goals.

Deriving Budget Figures

There are three ways that the budget committee can derive the estimates that appear in the final budget.

In one approach, known as imposed budget or top-down approach, the budgeted quantities are obtained from the top level managers and then communicated downward to the lower level managers. Low level managers do not participate in this type of budget, i.e., they have nothing to say about what is expected of them.

One important advantage of this type of budgeting is that the top level managers are involved in planning decisions and as such they have wider perspective of the firm's operation and would be in a position to allocate various resources among the various areas of responsibility.

Additionally, this is very cheaper because of the relatively fewer persons involved. However, this approach has two disadvantages. Firstly, top level managers, due to their positions, are separated from actual production and marketing processes and their allocation of resources to various areas would be without specific knowledge and as such may not be proper. Secondly, as the low level managers do not participate in preparing the budget, they are not motivated to work as per the estimates.

Another approach, known as participative approach is designed to eliminate the above disadvantages of imposed budgeting. In participating approach, estimations of lower level managers are coordinated and communicated upward to the top level managers. As lower level managers are given special importance in the preparation of budget figures, they will make special efforts to meet those goals. Participating approach rests on the belief that the low level managers who involve in day-to-day activities know very well his requirements and abilities and as such can give proper budgeted figures.

However, this approach too has disadvantages. Firstly, the manager may inflate the importance of his own area of responsibility and produce unrealistic demands. Secondly, to be in a comfortable position, each manager may provide for more inputs than required. And, from practical point of view, this approach is costlier to imposed approach.

Keeping in view the disadvantages of both the approaches, very few firms follow either a pure imposed or a pure participating approach. Thus, generally what is followed is the mixed approach, known as negotiated approach in which the possible goals set by higher level managers are

communicated downward to lower level managers for their acceptance. If the lower levels are not satisfied with the set goals they are allowed to suggest alternatives, either in terms of expectations or resources. Then, the upper management makes the necessary alternation. It is believed that this approach brings out the advantage of the other two, i.e., it combines a broad perspective of top management with precise knowledge of line managers. It also achieves a personal commitment from the lower levels to reasonable goals. Of course, all these advantages are obtained at a cost of high managerial expenses.

Selecting the Time Frame

The time/budget period is an important factor in developing a comprehensive budgeting programme. This is the period for which forecasts can reasonably be made and budgets can be formulated. A business enterprise generally prepares a Short-range budget and a Long-range budget.

Short-range Budget

Short-range budgets may cover periods of three, six or twelve months depending upon the nature of the business. Most manufacturing firms use one year as the planning period. Wholesale and retail firms usually employ a six-month budget which is related to their selling seasons. In determining the period of the Short-range budget, the following factors should be considered.

The budget period should be long enough to cover complete production of various products.

For business of a seasonal nature, the budget period should cover at least one entire seasonal cycle.

The budget period should be long enough to allow for the financing of production well in advance of actual needs. It should provide adequate time to arrange the funds for production and other purposes.

The budget period should coincide with the financial accounting period to compare actual results with the budget estimates and thus to facilitate better interpretation of the performance.

Long-range Budget

A Long-range budget or planning is defined as "a systematic and formalised process for purposefully directing and controlling future operations toward a desired objective for periods extending beyond one year." Long-range budgets cover specific areas, such as future sales, future production, long-term capital expenditures, extensive research and development programms, financial requirements, profit/forecast. They evaluate the future implications associated with present decisions and help management in making present decisions and select the most profitable alternative. Long-range budgeting does not eliminate risk altogether, it only reduces the risk to a level which does not hamper the production and achievement of company objectives.

There are many factors which are duly considered while preparing long-term budgets, such as market trends, economic factors, growth of population, consumption pattern, industrial production, national income, government economic and industrial policy. Quantitative sales can be budgeted for a three to five year period. After forecasting sales, a budgeted profit and loss account can be prepared relating anticipated sales to corresponding cost and thus net operating profit can be forecasted. Likewise, a balance sheet for many years can be prepared to forecast cash, inventory levels, accounts receivable, accounts payable, liabilities, etc. The forecasted profit and loss account and balance sheet for a Long-range is a very useful tool in accomplishing the objectives of the organisation as a whole.

Limiting or Principal Budget Factor

When budgets are made, there is invariably some factor which governs or sets a limit to the quantity which can be made or sold. This is known as the limiting or principal budget factor. A principal budget factor is "the factor the extent of whose influence must first be assessed in order to ensure that the functional budgets are reasonably capable of fulfilment." In the field of sales the limiting factor is customer demand which is influenced by many factors, such as price and quality of the product, competition, the general purchasing power of the public, advertising, etc. In the field of production, the principal budget factor may be plant capacity, the supply of labour of the right quality or the availability of scarce materials. Sometimes, management itself may impose limiting factors, e.g., management may control production to maintain a definite price level or management may not decide to purchase plant and machinery and thus to maintain the same plant capacity.

The limiting or principal budget factors must be carefully considered while preparing the budget. If not properly taken into account, budgets may not be realistic and become difficult to achieve. Co-ordination among different departments will be lacking. The principal budget factors can be eliminated by taking suitable measures, for example, the plant capacity can be increased by purchase of additional plant.

The Budgeting Process

Budgeting Sales

Every activity of a profit oriented firm must be directed to one overall goal – sales because if the products cannot be sold at a profit, there would not be any economic reason for the firm to produce them. And also, sales is regarded as the primary source of cash. The capital-additions needed, the production level, manpower requirements and other important operational aspects depend on the volume of sales.

Thus, the sales plan is the foundation for periodic planning in the firm, because practically all other enterprise planning is built on it. The usefulness of the entire budget depends on the reliability of the sales estimates. If sales estimate is too low, profits will be lost because the firm will not be able to provide all the units, the customers demand. And, if the sales estimate is too high, the firm has to incur more costs than it can recover by sales. Hence, a great deal of effort should be expended on the preparation of the forecast of sales.

Much of the expertise for the preparation of sales forecast is generally found within the marketing staff of the firm. This group will gather information from many sources and marketing studies are done to determine whether the market for the product still exists or not and if it does how large it will be. Various possibilities such as price changes, etc., are evaluated and various strategies are framed. The Budget Committee will accept the best one among the various alternatives and the planning phase begins. An important factor considered in the planning of the sales volume is price at which the product can be sold.

Pricing Decision

Three important factors that affect pricing decision are demand for the product, cost recovery and profit margins.

Demand

Before deciding the price of the product a firm has to check whether market already exists for that product or whether it is a new product in the market. If it is already an existing product in the market, it can charge a higher price for the product only when it can create products with superior quality. Or else, it should check whether it is profitable for it to sell at the existing price or at a lower one. If, on the other hand, the product is a new one, though it has freedom in selecting the price level in the beginning it should build flexibility into the pricing system so that it can respond quickly to any strategy that may be employed by others later.

Another approach is first to determine the price in order to attract the customers and then to design the product in such a way that it can be manufactured at a cost sufficiently low to assure a profit.

Cost Recovery

Law of economics holds that if a firm has to survive, its total sales revenue should exceed its total costs. The firm should determine the price level, at which sales revenue exceeds the total costs, which includes not only the production costs but also selling and administration costs. Thus, the firm can adopt cost-plus strategy, i.e., to determine the selling price by adding profit margin to the average unit cost. This approach should be made by careful market research as it completely neglects the competition. It assumes that the competitors will essentially have the same cost and same profit margin as the firm has.

Profit Margins

The third major point to be considered in establishing prices concerns the amount of profit that management would like to achieve in the upcoming time period. Generally, the goal of the management is to obtain satisfactory profits. Usually, businessmen employ two measures in gauging the size of the profits. They are return on sales and return on investment. Return on sales represents the portion of each sales dollar that eventually ends up as a profit and return on investment is the ratio between net profits and the assets used to produce those profits. Whatever is the measure employed, the firms should determine the rate of return required and establish the desired amount of profit and then select the pricing policy.

Sales Budget

After determining the price at which the product is to be sold, it should decide the volume of units that it can sell. It cannot establish a high sales volume as the firm may not be able to capture the market to sell that many units. Then, the sales budget is prepared which is the numeric representation of the marketing department plans for the coming year.

Table 1.1 presents a specimen of a sales budget.

Table 1.1: ABC Company Ltd.
Sales Budget for the year ending December 31, 2001

Products	Budgeted Sales Units	Budgeted Sales Price	Total
A	70,000	55	38,50,000
B	80,000	40	32,00,000
	1,50,000		**70,50,000**

Budgeting Production

Once the sales forecast is established, it is the task of the budget committee to prepare plans for making the product available for sale. The requirements of the sales plan must be translated into the supporting activities of the other major functions. In the case of a service company, the sales plan must be converted to service capability requirements; for a retail or wholesale enterprise, the sales plan must be translated into merchandise purchases requirements; and in the case of a manufacturing enterprise, the sales plan must be converted to production (manufacturing) requirements.

Outputs

As the sales forecast deals with the number of units to be sold, production budget deals with the products that are to be produced/manufactured. In rare cases production output equals sales. It is highly possible that some of the items sold comes from the inventory held or some of the units products add up to the inventory held. So, production management should not only co-ordinate with sales management but also with inventory management.

The general equation which deals with flow of goods is:

Beginning inventory + Production – Sales = Ending inventory.

This can also be expressed as:

Production = Sales + Change in Inventory.

Where change in inventory is equal to

Ending Inventory – Beginning Inventory.

Thus, if there is no change in inventory then cost of production will be equal to cost of goods to be sold. But, if the management feels that the future sales will be growing it will seek to utilise as much production capacity as possible in case of inflation in order to produce at the lowest cost possible and to earn revenues later. In this case, as the inventories have to be increased in anticipation of being sold at higher prices, production must also be increased. On contrast, if a decline in future demand is expected, it is appropriate to reduce the inventory in order to avoid holding losses from decline in prices and thus production has to be below sales volume.

Table 1.2 exhibits a specimen of production budget.

Table 1.2: ABC Company Ltd.
Production Budget for the year ended December 31, 2001

	Products	
	A	**B**
Budgeted Sales (in units)	70,000	80,000
Add: Desired closing finished goods inventory	20,000	30,000
	90,000	1,10,000
Less: Beginning finished goods inventory	40,000	20,000
Budgeted production requirement	50,000	90,000

The Schedule presented above is the overall production budget for ABC Company Ltd. The publication of the production budget accomplishes the co-ordination of the efforts of the production

and sales divisions. The latter group knows what it has to sell and the former knows what it has to produce.

Inputs

The production budget forms the basis for direct labour budgets, material budgets and manufacturing overheads budgets. Figure 1.5 presents graphically the flow of the planning activity from sales through the manufacturing executive's plan.

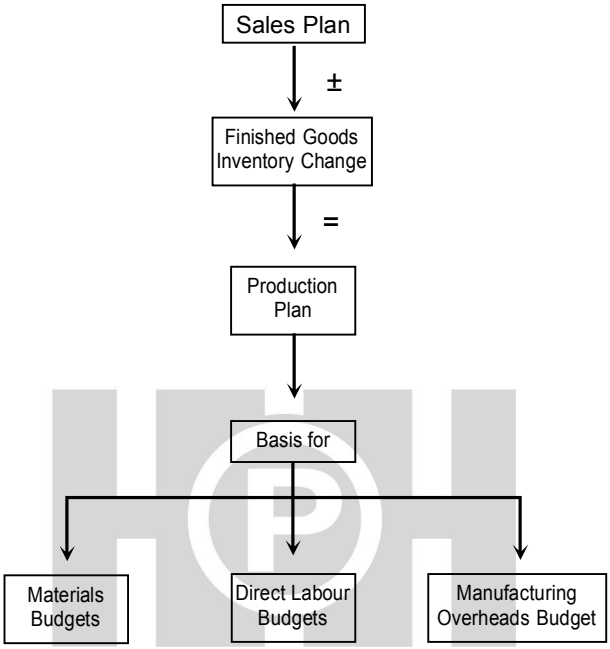

Figure 1.5

Thus, after co-ordinating plans for output, the next step for the production manager is to anticipate the acquisition of direct labour, direct material and manufacturing overhead expenses.

Direct labour costs consists of wages paid to employees who are engaged directly in specific productive output. Thus, direct labour budget represents the direct labour requirements necessary to produce the types and quantities of outputs planned in the production budget.

In planning for direct labour, the manager needs to examine such areas: manpower needs, recruitment, training, job evaluation and specification, performance evaluation, union negotiations and wage contracts.

The manager should identify his needs for skilled labour and see whether he can provide for them from the existing payroll or whether he can train some of his employees. He has to determine the price per labour hour. He must also carefully consider the requirements of union contracts before preparing a labour budget.

Table 1.3 illustrates the preparation of a direct labour budget.

Table 1.3: ABC Company Ltd.
Direct Labour budget for the year ended December 31, 2001

	Products		Total
	A	B	
Budgeted Production			
Direct labour	50,000	90,000	
Hours/Units	3	2	
Total direct labour	1,50,000	1,80,000	3,30,000
Hours			
Direct labour	₹ 5	₹ 5	₹ 5
Cost/hour			
Total direct labour cost	7,50,000	9,00,000	16,50,000

Labourers cannot produce a product unless they have materials and production planning requires anticipating the need for materials.

A direct materials budget indicates the expected amount of direct materials required to produce the budgeted units of finished good. This budget specifies the cost of direct materials used and the cost of the direct materials purchased. Table 1.4 explains the calculation of the direct materials budget. The usage part of the direct materials budget determines the cost of purchases of direct materials.

Table 1.4: ABC Company Direct Materials Budget for the Year Ending December 2001

	Products		Total
	A	B	
A. Usage Budget			
Budgeted product in units	50,000	90,000	
Direct materials requirement			
Product A: 5 kg per unit	× 5		
Product B: 8 kg per unit		× 8	
Direct materials usage (kg)	2,50,000	7,20,000	
Cost per kg (₹)	1.00	1.50	
Cost of direct materials	2,50,000	10,80,000	13,30,000
B. Purchase Budget	Direct materials (In kg)		
Direct material usage	2,50,000	7,20,000	
Add: Budgeted closing direct materials Inventory	50,000	75,000	
Total Requirements	3,00,000	7,95,000	
Less: Beginning direct materials inventory	70,000	1,00,000	
Purchase of direct materials	2,30,000	6,95,000	
Cost per kg	₹ 1.00	₹ 1.50	
Cost of purchase	₹ 2,30,000	₹ 10,42,500	

The direct materials budget is useful in the following ways:

- It helps the purchasing department to prepare a schedule to ensure delivery of materials when needed.
- It helps in fixing minimum and maximum levels of inventories in the stores department.
- It helps the finance manager to determine the financial requirements to meet production targets.

The materials budget usually deals with direct materials only. Supplies and indirect materials are generally included in the factory overhead budget.

In addition to direct labour and materials budget, the production manager may need to plan for other manufacturing overhead items like indirect labour, supplies, repairs, power and other factory overheads.

The factory overhead budget estimates the requirements and costs of the above overheads for the production of the budgeted units. It requires that expenses should be classified by departments since expenses are incurred by various departments. In this way departmental heads should be held accountable for expenses incurred by their departments. Generally, the department heads prepare budgets for their respective departments for the budget period. However, they need considerable help and advice from the budget director in order to achieve production budget.

Table 1.5 depicts the factory overhead budget wherein overhead costs have been classified into fixed and variable components.

Table 1.5: ABC Company
Factory Overhead Budget for the Year Ending December 2001
(based on budgeted capacity of 3,30,000 direct labour hours)

Items	Direct Labour hours	Rate per direct labour hour (₹)	Total Cost
A. Variable factory overheads			
Supplies	3,30,000	0.70	2,31,000
Repairs	3,30,000	0.30	99,000
Indirect Labour	3,30,000	0.70	2,31,000
Others	3,30,000	0.25	82,500
Total variable factory Overheads cost			6,43,500
B. Fixed Factory			
Overheads cost			
Supervision		3,00,000	
Depreciation		3,50,000	
Property tax		1,50,000	
Others		2,06,500	
Total fixed factory Overheads cost			10,06,500
Total factory Overheads cost			16,50,000
pre-determined overhead rate $= \frac{₹16,50,000}{3,30,000 \text{ hours}}$ = ₹ 5 per direct			

Budgeting Closing Inventories

An inventory budget can be prepared to find out the values of direct materials and finished goods inventory as shown in Table 1.6

Table 1.6: ABC Company
Ending Inventory Budget for the Year Ending December, 2001

	₹
Direct materials inventory	50,000
Product A 50,000 kg × ₹ 1.00 per kg	1,12,500
Product B 75,000 kg × ₹1.50 per kg	1,62,500
Finished goods inventory	7,00,000
Product A 20,000 units × ₹ 35.00	9,60,000
Product B 30,000 units × ₹ 32.00	16,60,000

* Manufacturing cost per finished unit (calculated in Table.1.7)

Table 1.7

	Product A			Product B		
	Quantity Required Kgs/hrs	Unit cost ₹	Product Unit Cost ₹	Quantity Required Kgs/hrs	Unit cost ₹	Product Unit Cost ₹
Direct material	5	1.00	₹ 5.00	8	1.5	₹ 12.00
Direct labour	3	5.00	₹ 15.00	2	5	₹ 10.00
Factory overheads	3	5.00	₹ 15.00	2	5	₹ 10.00
Total manufacturing cost						
Cost per finished unit			**₹ 35.00**			**₹ 32.00**

Budgeting Cost of Goods Sold

After preparing direct materials, direct labour, factory overhead, and ending inventory budgets, the cost of goods sold budget can be prepared. The cost of goods sold budget summarises all the above budgets as shown in Table 1.8.

Table 1.8: ABC Company
Cost of Goods Sold Budget for the Year Ending December 31, 2001

Direct materials	2,20,000	
Beginning inventory (70,000 × 1.00 + 1,00,000 × 1.50)	12,72,500	
Purchases (Table 1.4 B)	14,92,500	
Less: Closing inventory	1,62,500	13,30,000
Cost of direct materials used (Table 1.4 A)		16,50,000
Direct labour (Table 1.3)		16,50,000
Factory overheads (Table 1.5)		46,30,000
Total factory cost		

Add: beginning finished goods inventory (40,000 × 35 + 20,000 × 32)		20,40,000
Total goods available for sale		66,70,000
Less: finished goods inventory (Table 1.6)		16,60,000
Cost of goods sold		52,10,000

Budgeting Administration

The administrative expense budget covers the administrative costs for non-manufacturing business activities. Budgeting administrative expense is often difficult. Perhaps the first difficulty is in classifying certain costs as production or administrative. For example, costs like purchasing, engineering, personnel, research and development can be administrative as well as production. Unless such and other expenses are properly classified, their proper budgeting and subsequent control cannot be exercised. The second difficulty is in determining the persons responsible for the incurrence and control of these costs.

However, in order to accomplish the purpose of cost control in cost accounting, it is necessary that each item of cost should be under the jurisdiction and control of a responsible person who is accountable for incurring the cost. Table 1.9 presents an administrative expense budget.

Table 1.9: ABC Company
Administrative Expenses Budget for the year ending December 31, 2001

Items	Amount (₹)	Amount (₹)
A. Variable administrative expenses:		
(i) Supplies	30,000	
(ii) Clerical wages	65,000	
Total variable administrative expenses		95,000
B. Fixed Administrative Expenses:		
(i) Directors' remuneration	3,00,000	
(ii) Legal charges	20,000	
(iii) Depreciation	2,50,000	
(iv) Salaries	43,000	
(v) Rent	60,000	
(vi) Postage, telephone, etc.	32,000	
Total fixed administrative expenses		7,05,000
Total administrative expenses		8,00,000

Budgeting Selling Expenses

Closely related to the sales budget is the selling and distribution cost budget which shows the budgeted costs of promoting sales for the budget period. It is also known as the marketing expense budget. A selling expense budget consists mainly of the following major items:

- Sales representatives (salaries, commissions, entertaining and travelling).
- Sales office (office supplies, salaries, postage, telephone, rent and rates).
- Publicity office (salaries, office costs, press, journals, television, cinema, samples, sundries).
- Warehousing, packing and dispatch (salaries, packing wages, drivers wages, vehicle, costs, sundries).

Table 1.10 exhibits an annual selling expense budget classified according to fixed and variable expenses. The annual budget should be broken down on a monthly basis so that actual expenses can be compared with the budget monthly. Also, separate budgets for each of these expenses may be prepared especially in the case of a large company.

Table 1.10: ABC Company
Selling Expenses Budget for the year ending December 31, 2001

Items	Amount (₹)	Amount (₹)
A. Variable Selling Expenses:		
(i) Sales commission	1,00,000	
(ii) Salary and wages	60,000	
(iii) Advertising	30,000	
(iv) Travelling	60,000	
Total variable selling expenses		2,50,000
B. Fixed Selling Expenses:		
(i) Warehousing	1,00,000	
(ii) Advertising	75,000	
(iii) Marketing Managers' salary	1,25,000	
(iv) Depreciation	50,000	
Total fixed selling expenses		3,50,000
Total selling expenses		6,00,000

Budgeting Cash

The next step in the budgeting process is to prepare cash budget. Managers must be concerned with the amount of cash that flows in and out of the firm, as well as the amount that happens to be on hand at any particular time. If the firm has less cash than enough to keep the creditors satisfied it may have to face a suit filed by the creditors. On the other hand, if the firm has excess cash on hand, the firm would earn no income on it. So, the cash manager must have neither too little nor too much.

The first step, then, in preparing cash budget is to establish the desired amount to have on hand, i.e., which will be enough to meet any emergencies. The second step requires the manager to identify all the sources from which cash flows into the firm, like revenues from sales, borrowings, etc. He must also estimate the timing of the cash inflow. The third step is to identify the applications or uses of cash, such as payment for purchases, utility bills, salaries, etc. Even here he has to estimate the timing of the flow. Finally, these predictions are brought together in the cash budget, and the results are analysed. If there will be excess funds on hand, then plans should be made to find profitable temporary investments to occupy them and if shortages are predicted the manager should plan for short-term loans.

Table 1.11 presents a typical cash budget.

Table 1.11: ABC Company Cash Budget for the year ended

	Amount (₹)	Amount (₹)
Beginning cash balance		2,00,000
Add: Receipts:		
Cash Sales (50% of current year's sales)	35,25,000	
Receivables Collections (50% of previous year's sales)	32,50,000	
Investment income	0	67,75,000
Total cash available for use		69,75,000
Less: Expenditures:		
Cash Purchases	12,72,500	
Labour and Factory Overheads	33,00,000	
Administrative and Selling Expenses	14,00,000	
Total cash to be used		59,72,500
Net cash available		10,02,500

Budgeted Financial Statements

After plans have been made for the firm's cash, revenues, costs and asset acquisitions, it is possible to prepare budgeted financial statements. These statements will be identical to ordinary ones except that they will show the expected results of the operations for the forthcoming year and expected financial position as on that particular future date.

Tables 1.12 and 1.13 shows the Budgeted Income Statement of ABC Co. Ltd. and a typical balance sheet respectively. These statements along with cash budget represents the Master Budget which is presented to the board of directors by the budget committee.

Table 1.12: ABC Company Ltd.
Budgeted Income Statement for the year ended December 31, 2001

	Amount (₹)	Amount (₹)
Sales (Table 1.1)		70,50,000
Cost of goods sold (Table 1.8)		52,10,000
Gross Margins		18,40,000
Selling Expenses (Table 1.10)	6,00,000	
Administrative Expenses (Table 1.9)	8,00,000	14,00,000
Income before taxes		4,40,000
Income taxes (assuming 40%)		1,76,000
Net income		2,64,000

Table 1.13: ABC Company Ltd.
Budgeted Balance Sheet as on December 31, 2001

Capital and Liabilities		Amount (₹)	Assets		Amount (₹)
Equity Capital		60,00,000	Fixed Assets:	25,00,000	
Reserves and Surplus	7,00,000		*Less:* Depreciation @ 26% Investments	6,50,000	18,50,000
Add: Budgeted Net Income	2,64,000	9,64,000			
Long-term Loans		10,00,000	Current Assets:		
Current liabilities:			Cash		10,02,500
Sundry Creditors		60,000	Sundry debtors		35,25,000
Accrued Expenses:			Closing Inventories (1,62,500 + 6,60,000)		18,22,500
Income-tax payable		1,76,000			
		82,00,000			**82,00,000**

Revision of Budgets

As stated earlier in the chapter, successful budgets should have adequate flexibility to meet changing business conditions. Since budgets are used for planning, operation, co-ordination and control, they should be revised if changes occur in the environment. Revision of budgets may be necessary due to the following factors some of which might have been considered earlier in the development of budgets:

- Errors committed in preparing the budgets which may subsequently be known.
- Emergence of unforeseen and unanticipated situations which may cause the budget to be revised.
- Changes in internal factors, e.g., production forecast, sales forecast, capacity utilisation, etc.
- Changes in external factors, e.g., market trends, nature of the economy, prices of inputs and resources, consumers' tastes and fashions.

Fixed and Flexible Budgeting

Fixed Budgeting

A fixed budget is the budget which is designed to remain unchanged irrespective of the level of activity actually attained. It is based on a single level of activity. A fixed budget performance report compares data from actual operations with the single level of activity reflected in the budget. It is based on the assumption that the company will work at some specified level of activity and that a stated production will be achieved. Fixed budgets do not change when production level changes.

However, in practice, fixed budgeting is rarely used. The main reason is that actual output is often significantly different from the budgeted control. The performance report may be misleading and will not contain very useful information. For example, if actual production is 12,000 units in place of

the budgeted 10,000 units the cost incurred cannot be compared with the budget which relates to different levels of activity. Since, in fixed budgeting, units are overlooked, a cost to cost comparison without considering the units may give misleading results.

Flexible Budgeting

A flexible budget is defined as "a budget which by recognising the difference between fixed, semi-fixed and variable costs, is designed to change in relation to the level of activity attained."

A flexible budget is a budget that is prepared for a range, i.e., for more than one level of activity. It is a set of alternative budgets to different expected levels of activity. Thus, a flexible budget might be developed that would apply to a "relevant range" of production, say 8,000 to 12,000 units. Under this approach, if actual production slips to 9,000 units from a projected 10,000 units, the manager has a specific tool (i.e., the flexible budget) that can be used to determine budgeted cost at 9,000 units of output. The flexible budget provides a reliable basis for comparisons because it is automatically geared to changes in production activity.

Steps in Flexible Budgeting

The following steps (stages) are involved in developing a flexible budget:

- Deciding the range of activity to which the budget is to be prepared.
- Determining the cost behavior patterns (fixed, variable, semi-variable) for each element of cost to be included in the budget.
- Selecting the activity levels (generally in terms of production) to prepare budgets at those levels.
- Preparing the budget at each activity level selected by associating the activity level with corresponding costs. The corresponding costs to be attached with each activity level are determined in terms of their behaviour, i.e., fixed, variable and semi-variable.

Zero-based budgeting: A budget is developed usually on the concept of incrementalism. In case of budgeting in organisations, past events are considered in the light of future probabilities. The influence of past is strong in the budget of an ongoing activity and many entries may ultimately become just last year's figures plus a fixed percentage over and above that value. Since previous year's figures are considered as base, any inaccuracies in those figures are carried forward year after year.

But in zero-based budgeting, this can be avoided. In case of ZBB, each manager is asked to prepare his own requirement of funds beginning from scratch, ignoring the past and he has to justify the requirements mentioned by him. Hence, the main idea behind ZBB is to challenge the existence of every budgetary unit and every budget period.

Illustrations

Illustration 1: Prepare the Sales Budget from the following data:

Product	January	February
X	1200 units	1800 units
Y	3600 units	5400 units

The sales area A and B account for 60% and 40% sale of product X and 30% and 70% sale of product Y respectively.

The selling price per unit of product X ₹ 24 and the selling price per unit of product Y ₹ 30 in both the sales areas.

Solution:

January Sales Budget

Product	Area	Units	₹	₹
X	A	720	24	17,280
	B	480	24	11,520
Total		**1,200**		**28,800**
Y	A	1,080	30	32,400
	B	2,520	30	75,600
Total		**3,600**		**1,08,000**

February Sales Budget

Product	Area	Units	₹	₹
X	A	1,080	24	25,920
	B	720	24	17,280
Total		**1,800**		**43,200**
Y	A	1,620	30	48,600
	B	3,780	30	1,13,400
Total		**5,400**		**1,62,000**

Total Sales Budget

Product	Area	Units	₹	₹
X	A	1,800	24	43,200
	B	1,200	24	28,800
Total		**3,000**		**72,000**
Y	A	2,700	30	81,000
	B	6,300	30	1,89,000
Total		**9,000**		**2,70,000**

Illustration 2: A manufacturing company is operating at 75% of its full capacity. It is proposed to offer a price reduction of 5% to 10% depending upon volume desired. Given below are the relevant data:

Capacity	75%	85%	100%
Output (units)	75,000	85,000	1,00,000
Selling price unit	₹ 96	5% off	10% off
Material cost per unit	₹ 40	10% less	15% less
Wages cost per unit	₹ 10	₹ 10	₹ 10

Fixed overheads:

Production ₹ 14,00,000

Selling and distribution ₹ 5,00,000

Variable overheads: (at full capacity)

Selling and administration ₹ 4,40,000

Production ₹ 14,00,000

(a) Prepare a statement showing variable cost, fixed cost, total cost and profit/loss in terms of ₹ and per unit at 75%, 85% and 100% capacity.

(b) Indicate which of the three levels is most profitable.

Solution:

Capacity		75%		85%		100%	
Units		75,000		85,000		1,00,000	
		p/u	Amt.	p/u	Amt.	p/u	Amt.
Sales	(a)	96	72,00,000	91.20	77,52,000	86.40	86,40,000
Less: Variable Cost							
Material		40	30,00,000	36	30,60,000	34	34,00,000
Wages		10	7,50,000	10	8,50,000	10	10,00,000
Variable production o/h		14	10,50,500	14	11,90,000	14	14,00,000
Variable selling and admn. o/h		4.40	3,30,000	4.40	3,74,000	4.40	4,40,000
Total variable cost	(b)	68.4	51,30,000	64.4	54,74,000	62.40	62,40,000
Contribution	(a-b)	27.6	20,70,000	26.8	22,78,000	24	24,00,000
Fixed overheads:							
Production		18.67	14,00,000	16.47	14,00,000		14,00,000
Selling and Administration		6.67	5,00,000	5.88	5,00,000	14	5,00,000
Profit		2.27	1,70,000	4.47	3,78,000	6	5,00,000

Recommendation: Operating at 100%, i.e., at full capacity is most profitable.

Illustration 3: A Factory is currently working at 50% capacity and produces 30,000 units and also sold each at ₹ 225 per unit. Prepare a Flexible Budget and estimate the profit of the company when it works to 75% and 90% capacity. Assume that all units produced are sold at the same selling price per unit as shown above.

Following information is provided to you:

(i) Variable Expenses:

Materials	₹ 60 per unit
Labours	₹ 40 per unit
Other Expenses	₹ 15 per unit

(ii) Semi-variable Expenses: (at 50% capacity)

Indirect Labour	₹ 1,50,000
Indirect Materials	₹ 2,10,000
General Administrative Expenses	₹ 2,70,000
Repairs and Maintenance	₹ 1,20,000
Salesmen Salaries	₹ 1,80,000

(iii) Fixed Expenses:

Office and Management Salaries	₹ 5,40,000
Office and Factory Rent and Taxes	₹ 6,00,000
Sundry Administrative Expenses	₹ 7,20,000
Depreciation on Machinery and Furniture	₹ 4,50,000

(iv) Semi-variable expenses remain constant up to 60% of capacity, increasing by 10% between 60% and 80% capacity and by 20% between 80% and 100% capacity.

(v) Rate per unit of variable expenses remains same.

Solution:

Flexible Budget

	30,000 units 50%	**45,000 units 75%**	**54,000 units 90%**
(i) Variable Expense	**₹**	**₹**	**₹**
Materials	18,00,000	27,00,000	32,40,000
Labours	12,00,000	18,00,000	21,60,000
Other Expenses	4,50,000	6,75,000	8,10,000
(ii) Semi-variable Expenses			
Indirect Labour	1,50,000	1,65,000	1,80,000
Indirect Materials	2,10,000	2,31,000	2,52,000
General Administrative Expenses	2,70,000	2,97,000	3,24,000
Repairs and Maintenance	1,20,000	1,32,000	1,44,000
Salesmen Salaries	1,80,000	1,98,000	2,16,000
(iii) Fixed Expenses			
Office and Management Salaries	5,40,000	5,40,000	5,40,000
Office and Factory Rent and Taxes	6,00,000	6,00,000	6,00,000
Sundry Administrative Expenses	7,20,000	7,20,000	7,20,000
Depreciation on Machinery and Furniture	4,50,000	4,50,000	4,50,000
Total Cost	**66,90,000**	**85,08,000**	**96,36,000**
	₹	**₹**	**₹**
	(30,000 × 225)	**(45,000 × 225)**	**54,000 × 225**
Sales	67,50,000	1,01,25,000	1,21,50,000
Less: total cost	66,90,000	85,08,000	96,36,000
Profit	**60,000**	**16,17,000**	**25,14,000**

Illustration 4: The following information relates to the productive activities of Delta Ltd. For 3 months ending on 31st March 2008:

Particulars	
Variables Expenses: (at 50% capacity)	**₹**
– Materials	6,00,000
– Labour	6,40,000
– Salesmen's Commission	95,000
	13,35,000
Semi-variable Expenses: (at 50% capacity)	
– Plant Maintenance	62,500
– Indirect Labour	2,47,500

– Salesmen's salaries	72,500
– Sundry	65,000
	4,47,500
Fixed Expense:	
– Management Salaries	2,10,000
– Rent and Taxes	1,40,000
– Depreciation of Machinery	1,75,000
– Sundry Office Expenses	2,22,500
	7,47,500

It is further noted that semi-variable expense remain constant between 40% and 70% capacity, increase by 10% of the above figures between 70% and 85% capacity and increased by 15% of the above figures between 85% and 100% capacity.

Fixed expenses remain constant whatever the level of activity may be. Sales at 60% capacity are ₹ 25,50,000, at 80% capacity are ₹ 34,00,000 and at 100% capacity are ₹ 42,50,500.

Assuming that all items produced are sold, you are required to prepare a flexible budget at 60%, 80% and 100% capacity.

Solution:

In the Books of Delta Ltd.
Flexible Budget for 3 months ending 31-3-2008

Capacity	60%	80%	100%
A. Fixed Expenses:			
Management Salaries	2,10,000	2,10,000	2,10,000
Rent and Taxes	1,40,000	1,40,000	1,40,000
Depreciation of Machinery	1,75,000	1,75,000	1,75,000
Sundry Office Expenses	2,22,500	2,22,500	2,22,500
Total (A)	**7,47,500**	**7,47,500**	**7,47,500**
B. Semi-variable Expenses:			
Plant Maintenance	62,500	68,750	71,875
Indirect Labour	2,47,500	2,72,250	2,84,625
Salesmen's salaries	72,500	79,750	83,375
Sundry	65,000	71,500	74,750
Total (B)	**4,47,500**	**4,92,950**	**5,14,625**
C. Variable Expense:			
Materials	7,20,000	9,60,000	12,00,000
Labour	7,68,000	10,24,000	12,80,000
Salesmen's Commission	1,14,000	1,52,000	1,90,000

Total (C)	**16,02,000**	**21,36,000**	**26,70,000**
D. Total Exp. (A + B + C)	27,97,000	33,75,750	39,32,125
E. Sales	25,50,000	34,00,000	42,50,000
F. Profit/Loss	**2,47,000**	**24,250**	**3,17,875**

Illustration 5: The following are the estimated sales of a company for eight months ending 30-11-2008:

Months		Estimated Sales (Units)
April	2008	12,000
May	2008	13,000
June	2008	9,000
July	2008	8,000
August	2008	10,000
September	2008	12,000
October	2008	14,000
November	2008	12,000

As a matter of policy, the company maintains the closing balance of finished goods and raw materials as follows:

Stock Items	Closing balance of a month
Finished goods	50% of the estimated sales for the next month
Raw Materials	Estimated consumption for the next month.

Each unit of production requires 5 kg. of raw material costing ₹ 5 per kg.

Prepare Production Budget (in units) and Raw Material Purchase Budget (in units and cost) of the company for the half year ending 30th September, 2008.

Solution:

Production Budget (in units)
For the half year ending 30th Sept. 2008

Month	Sales in Units	Closing Bal. 50% of Estimated Sales for Next Month	Opening Bal.	Production (2 + 3 + 4)
(1)	**(2)**	**(3)**	**(4)**	**(5)**
April	12,000	6,500	6,000	12,500
May	13,000	4,500	6,500	11,000
June	9,000	4,000	4,500	8,500
July	8,000	5,000	4,000	9,000
August	10,000	6,000	5,000	11,000
Sept.	12,000	7,000	6,000	13,000
	64,000			**65,000**

Purchase Budget (in Cost and Units)
For the half year ending 30th Sept. 2008

Month	Production in Units	Consumption kg. ₹ 2/- per Unit	Closing Balance	Opening Balance	Purchase in kg.	Rate ₹	Amount
April	12,500	25,000	22,000	25,000	22,000	5	1,10,000
May	11,000	22,000	17,000	22,000	17,000	5	85,000
June	8,500	17,000	18,000	17,000	18,000	5	90,000
July	9,000	18,000	22,000	18,000	22,000	5	1,10,000
August	11,000	22,000	26,000	22,000	26,000	5	1,30,000
Sept.	13,000	26,000	26,000	26,000	26,000	5	1,30,000
	65,000	**1,30,000**		**1,30,000**			**6,55,000**

Illustration 7: A manufacturing company submits the following figures for the first Quarter of 2003.

Sales/Month	Product in units	
	X	Y
January	25,000	30,000
February	20,000	25,000
March	30,000	35,000

Selling price per unit product X ₹10 product Y ₹ 20

Prepare a sales budget based, on the above data for the first Quarter of 2004 assuming,

(a) Sales quantity increase of X by 20%, Y by 10%

(b) Sales price increase of X : nil, Y : 10%

Solution:

NOTE: U = units, SP = selling price, A = Amount

Sales Budget

Actuals for 2003

	January			February			March			Total		
	U x SP= A			U x SP= A			U x SP= A			U x SP= A		
Product X	25,000	10	2,50,000	20,000	10	2,00,000	30,000	10	3,00,000	75,000	10	7,50,000
	30,000	20	6,00,000	25,000	20	5,00,000	35,000	20	7,00,000	90,000	20	18,00,000
Product Y	_	_	8,50,000	_	_	7,00,000	_	_	10,00,000	_	_	25,50,000

Budgeted for 2004

	January			February			March			Total		
	U x SP= A			U x SP= A			U x SP = A			U x SP= A		
Product X	30,000	10	3,00,000	24,000	10	2,40,000	36,000	10	3,60,000	90,000	10	9,00,000
	33,000	22	7,26,000	27,500	22	6,05,000	38,500	22	8,47,000	99,000	22	21,78,000
Product Y	–	–	10,26,000	–	–	8,45,000	–	–	12,07,000	–	–	30,78,000

Illustration 8: (Flexible budget)

Lucky Ltd. is currently operating at 75% of its capacity. In the past two years, the levels of operation were 55% and 65% respectively. Presently the production is 75000 units. The company is planning for 85% capacity level during 2005-2006. The cost details are as follows:

Particulars	₹		
	55%	65%	75%
Direct Materials	11,00,000	13,00,000	15,00,000
Direct Labour	5,50,000	6,50,000	7,50,000
Factory overheads	3,10,000	3,30,000	3,50,000
Selling overheads	3,20,000	3,60,000	4,00,000
Administrative overheads	1,60,000	1,60,000	1,60,000
TOTAL	**24,40,000**	**28,00,000**	**31,60,000**

Profit is estimated @ 20% on Sales

The following increase, in costs are excepted during the year:

	(in percentage)
Direct Materials	8
Direct Labour	5
Variable Factory Overhaeds	5
Variable Selling Overheads	8
Fixed Factory Overheads	10
Fixed Selling Overheads	15
Administrative Overheads	10

Prepare Flexible budget for the current year as well as for the period 2005-2006 at 85% of capacity.

Solution:

Flexible Budget

Units	75%		85%	
	Total 75000	**Per unit**	**Total 85000**	**Per unit**
Variable Cost:				
Direct Material	15,00,000	20.00	18,36,000	21.60
Direct labour	7,50,000	10.00	8,92,500	10.50
Variable Factory Overheads	1,50,000	2.00	1,78,500	2.10
Variable selling Overheads	3,00,000	4.00	3,67,200	4.32
Total Variable Cost	**27,00,000**	**36.00**	**32,74,200**	**38.52**
Fixed cost :				
Fixed Factory Overhead	2,00,000	2.67	2,20,000	2.59
Fixed Selling Overheads	1,00,000	1.33	1,15,000	1.35
Administrative overheads	1.60,000	2.13	1,76,000	.07
Total Fixed Cost:	**4,60,000**	**6.13**	**5,11,000**	**6.01**
Total Cost[VC+FC]	31,60,000	42.13	37,85,200	44.53
Profit	7,90,000	10.54	9,46,300	11.13
Sales	39,50,000	52.67	47,31,500	55.66

Working note:

1. Direct Materials per unit = 15,00,000/7500 = ₹ 20
2. Direct labour per unit = 7,50,000/75,000 = ₹10
3. Factory overheads:
   Variable = Difference in cost/Differnce in units = 20,000/10,000 = ₹ 2
   Therefore Fixed overheads =3,50,000 – [7500 × 2] = ₹ 2,00,000
4. Selling Overheads: Variable = difference in cost / difference in units = 40000/10000 = ₹ 4
5. Admimistrative Overheads Fixed = ₹ 1,60,000

Illustration 9: (Flexible Budget)

A manufacturing company is operating at 75% of normal capacity. It is proposed to offer a price reduction of 5% to 10% depending upon the sales volume desired given below are the relevant data.

Capacity	75%	85%	100%
Output (units)	75,000	85,000	1,00,000
Selling price unit	₹ 96	5%off	10%off
Unit	₹ 40	₹ 10%less	15%less
Unit	₹ 10	₹ 10	₹ 10

Production ₹ 14,00,000

Selling and administration ₹ 5,00,000

Varible overheads:

Production ₹ 14,00,000@ normal capacity

Selling and administration ₹ 4,40,000@ normal unit total cost unit total cost at capacity

(a) Prepare a single statement to show profit/loss at each level of output

(b) Compute unit variable cost, unit fixed cost and at different levels of outputs and

(c) Indicate which of the 3 levels is most profitable

Solution:

	Currently capacity				**Normal capacity**	
Units	**75,000**		**85,000**		**1,00,000**	
Capacity	**75%**		**85%**		**100%**	
	₹ P.U.	**Total ₹**	**₹ P.U.**	**Total ₹**	**₹ P.U.**	**Total ₹**
Sales	96.00	72,00,000	91.20	77,52,000	86.4	86,40,000
(-) Material	40.00	30,00,000	36.00	30,60,000	34.0	34,00,000
Wages	10.00	7,50,000	10.00	8,50,000	10.0	10,00,000
Variable Overheads:						
Production	14.00	10,50,000	14.00	11,90,000	14.0	14,00,000
Selling and administration	4.40	3,30,000	4.40	3,74,000	4.4	4,40,000
Total variable cost	68.40	51,30,000	64.40	54,74,000	62.4	62,40,000
Contribution	27.60	20,70,000	26.80	22,78,000	24.0	24,00,000
Fixed overheads:						
Production	18.67	14,00,000	16.47	14,00,000	14.0	14,00,000
Selling and administration	6.67	5,00,000	5.88	5,00,000	5.0	5,00,000
Profit	2.27	1,70,000	4.45	3,78,000	5.0	5,00,000

Recommendation: operating at 100% i.e., Normal capacity is most profitable

Illustration 10: (Purchase Budget)

Solo products manufactures single product and has sales of ₹ 126 lacs. Profit is 20%. Materials required are A = 3Ibs of ₹ 6 per Ib and B = 1.5 of ₹ 4 per Ib.

Labour charges are : Machine shop = ₹ 4 per hour

Assembly shop = ₹ 3.20 per hour

Number of Employees : Machine shop = 600

Assembly shop = 180

Details of materials, finished goods:

	Finished Good	**Material A**	**Material B**
Opening stock	20,000 units	54,000Ibs	33,000 Ibs
Closing stock	25,000 units	30,000Ibs	66,000 Ibs

Processing time: Machine shop = 7 hrs

(per unit of output) Assembly shop = 2 and half hrs

Factory works for 5 days of 8 hrs in a week in a normal 52 weeks a year.

Excepted Holidays = 96 hrs }

Excepted Leave = 80 hrs } in a year

Expected Absenteesim = 64 hrs}

Calculate:

1. Number of units to be sold.
2. Purchase budget
3. Capacity utilisation of machine and assembly shops

Solution:

Cost Sheet of……

	₹ Per unit
Material cost: A:3 × 6 = 18 B:1.5 × 4 = 6 Labour cost: Machine shop : 7 hrs × 4 = 28 Assembly shop : 2 ½hrs × 3.20 = 8	24 36
Total cost Profit = 20%(i.e. profit on sales)	60 15
Sales price	75

Total sales = 126 lacs

Therefore quantity of sales = sales value/ selling price per unit

= 126lacs/75

= 1,68,000 units

Material Budget:

Total finished goods units to be produced:

= sales + closing stock – opening stock

Production = 1,68,000 + 25000- 20,000

PRODUCTION = 1,73,000 UNITS

Materials required to produce:

A: 1,73,000 × 3 Ibs = 5,19,000Ibs

B: 1,73,000 × 1.5 Ibs = 2,59,500 Ibs

Value

For A: 4,95,000 Ibs × 6 = ₹ 29,70,000

For B: 2,92,500 Ibs × 4 = ₹ 11,70,000

₹ 41,40,000

Capacity utilisation of machine and assembly shops:

Total hours in machine shops utilised for production

=1,73,000 × 7 hrs = 12,11,000 hrs required

Total hours in assembly shops utilised

=1,73,000 × 2 ½ hrs = 4,32,500 hrs required

Total hours available:

Machine shop 5 days × 8 hrs × 52 weeks × 600 employees = 12,48,000 hrs

Assembly shop 5 days × 8 hrs × 52 weeks × 180 employees = 3,74, 400 hrs

Actual hours available:

Machine shop = 12, 48,000 hrs – (*240 × 600)

= 12,48,000 hrs – 1,44,000 = 11,04,000

*96 +80+64 = 240

Assembly shop = 3,74,400 hrs – (240 × 180)

= 3,74,400 hrs – 43,200 = 3,31,200

Caopacity utilised = HOURS REQUIRED/Actual hours available or Total hours available × 100

Machine shop = 12,11,000/11,04,000 × 100

= 109.69% = 1.1times

= 130.59% = 1.31 times

Illustration 11: (Manpower Budget)

The direct labour requirements of three of the products manufactured in a factory, each involving more than one labour operation, are estimated as follows;

Direct labour hours per unit (in minutes)

Products

Operation	Product 1	Product 2	Product 3
1	18	42	30
2	-	12	24
3	9	6	-

The factory works 8 hrs a day, 6 days a week. The budget quarter is taken as 13 weeks and during a quarter lost hours due to leave and holiday and other causes are estimated to be 124 hrs.

The budget hourly rates for the workers manning the operation 1, 2 and 3 are ₹ 2.00, ₹ 2.50, ₹ 3.00 respectively. The budgeted sales of the product during the quarter are:

Product 1 9,000 units

Product 2 15,000 units

Product 3 12,000 units

There is a carry over of 5000 units of product 2 and 4000 units of product 3 and it is proposed to build up a stock at the end of the budget quarter as follows;

Product 1 1,000 units

Product 2 2,000 units

Prepare a manpower budget for the quarter showing for each operation (i) direct labour hours (ii) direct labour cost and (iii) the number of workers.

Solution:

Preparation of labour budget

Computation of units to be produced

	Product 1	Product 2	Product 3
Units to be sold	9,000	15,000	12,000
Add: closing stock	1,000	2,000	_
Less: opening stock	_	5,000	4,000
Production	10,000	12,000	8,000

Time required (Mts)

Operation				Total
1	18	42	30	90
2	_	12	24	36
3	9	6	-	15

Total time required for production;

Operation 1:

For product 1 = 10,000 × 18 = 1,80,000 Mts

For product 2 = 12,000 × 42 = 5,04,000 Mts

For product 3 = 8,000 × 30 = 2,40,000 Mts

= 9,24,000 Mts

Operation 2:

For product 1 = 10,000 × – = –

For product 2 = 12,000 × 12 = 1,44,000 Mts

For product 3 = 8,000 × 24 = 1,92,000

= 3,36,000 Mts

Operation 3:

For product 1 = 10,000 × 9 = 90,000 Mts

For product 2 = 12,000 × 6 = 72,000 Mts

= 1,62,000 Mts

Total number of hours available 6264 hours

Hours lost in leave, holiday etc. 124 hours

500 hours

500 hrs × 60Mts per hour = 30,000 Mts

Therefore number of labourers required for:

For operation 1 = 9,24,000/30,000 = 30.8 labourers = 31 labourers

For operation 2:

Time required = 3,36,000/30,000 = 11.2 labourers = 12 labourers

For operation 3:

Time required 1,62,000 Mts

Time available 30,000 Mts

Therefore labourers required = 1,62,000/30,000 = 5.4 labourers = 6 labourers

Labourer hours required:

Operation 1 = 9,24,000/60 = 15,400 hrs

Operation 2 = 3,36,000/60 = 5,600 hrs

Operation 3 = 1,62,000/60 = 2,700 hrs

Labour cost:

Operation 1 = 9,24,000/60 × 2 = ₹ 30,800

Operation 2 = 3,36,000/60 × 2.50 = ₹ 14,000

Operation 3 = 1,62,000/60 × 3 = ₹ 8,100

Total = ₹ 52,900

Illustration 12: (Flexible budget)

A factory engaged in manufacturing plastic bucket is working to 40% capacity and produces 10,000 buckets per annum. The present cost break up for one bucket is as under:

Materials ₹ 10

Labour cost ₹ 3

Overhead (60% FIXED) ₹ 5

The selling price is ₹ 2 per bucket. It is decided to work the factory at 50% capacity, the selling price falls by 3%. at 90% capacity the selling price falls by 5% accompanied by a similar fall even points for the same capacity of production.

Solution:

Capacity	**100%**		**90%**		**50%**		**40% (given)**	
Units	**25,000**		**22,500**		**12,500**		**10,000**	
Particulars	**₹**		**₹**		**₹**		**₹**	
Sales	20	5,00,000	19	4,27,500	19.4	2,42,500	20	2,00,000
(–)variable costs:								
Material	10	2,50,000	9.5	2,13,750	10	1,25,000	10	1,00,000
Labour	3	75,000	3	67,500	3	37,500	3	30,000
	2	50,000	2	45,000	2	25,000	2	20,000

Variable Overheads	5	1,25,000	4.5	1,01,250	4.4	55,000	5	50,000
Contribution	1.2	30,000	1.33	30,000	2.4	30,000	3	30,000
(–)fixed costs	3.8	95,000	3.17	71,250	2	25,000	2	20,000
Profit	0.25		0.24		0.23		0.25	
P/v ratio = C/S	30,000/0.25		30,000/0.24		30,000/0.23		30,000/0.25	
BEP = FC/P/V	1,20,000		1,26,667		1,32,273		1.20,000	
BEP(₹)	6,000		6,667		6,818		6,000	
BEP (units)								

Illustration 13: PRONTO Company plant had operated at 60% capacity in the year 2005. The summarised results were;

Sales – ₹ 40 lakhs Material cost ₹12 lakhs

Direct labour ₹ 6 lakhs Overheads ₹ 10 lakhs

It is excepted that market will expand to match 75% capacity, when overheads are excepted to touch ₹ 12 lakhs, during 2006

I. Based on above information calculate

(1) Break even points in the years 2005-2006

(2) Margin of safety in 2006

Ii Further capacity utilisation (increases in sales quantity) can be achived only with 5% price reduction.

Calculate the sales target and capacity utilisation to earn profit of ₹ 17 lakhs in the year 2006.

Solution:

	2005	**2006**
Capacity	60%	75%
Material	12	15
Labour	6	7.5
Overheads:		
Variable overheads	8	10
Fixed overheads	2	2
Sales	40	50.0
(–)variable costs	26	32.5
Contribution	14	17.5
(–)fixed costs	2	2.0
Profit	12	15.5

60%	10	10		12	
75%	12	VC	FC	VC	FC
15%	2	8	2	10	2

$15 \times 4 = 60$ $2 \times 4 = 8$ variable cost

$15 \times 5 = 75$ $2 \times 5 = 10$ variable cost

For variable overhead =differential cost/ differential capacity

	2005	**2006**
P/V Ratio	0.35	0.35
BEP	5.71	5.71
MOS	34.29	44.29
MOS%	85.71	88.57%

	PRICE ⇩ 5%	
Sales	47.5	60.17
Less: variable cost	32.5	41.17
Contribution	15.0	19.00
Less : fixed cost	2.0	2.00
Profit	13.0	17.00

P/V Ratio = C/S = 154/47.5

= 0.31

Sales required = Target profit + Fixed cost/P/V Ratio

= 17+ 2/0.31 = ₹ 60.17 lakhs

Illustration 14: Cost accountant of Norma Ltd. has prepared following flexible budget (₹ 100)

Capacity ⇨	**70%**	**80%**
Depreciation	11	11
Insurance	3	3
Indirect labour	10.5	12
Power	17	20
Repairs and maintenance	19	20
Salaries	10	10
Stores consumable	3.5	4

If 100% capacity represents 50 tonnes.

What would be the budgeted overhead cost per tone at production level of 33 tonnes?

If the prime cost is ₹ 5,000 per tone, what is the production cost per tone at 100% capacity utilisation?

Solution:

Capacity	100%	80%	70%	66%
Quantity (tonne)	50	40	35	33
Variable cost:				
Indirect labour	15	12	10.5	9.9
Stores consumable	5	4	3.5	3.3
Semi-variable cost:				
Power	26	20	17	15.8
Repairs and maintenance	22	20	19	18.6
Fixed cost:				
Depreciation	11	11	11	11.0
Insurance	3	3	3	3.0
Salaries	10	10	10	10.0
Total cost	**92**	**80**	**74**	**71.6**
Overhead cost per tone i.e.1,000kgs	1,840	2,000	2,114.28	2,169.70
(+)prime cost per tone	5,000			
Production cost per tonne	6,840			

Illstration 15: (sales, production and materials purchase budget master budget)

A company manufactures product A and product B. During the year ending December, 2006, it is excepted sell 15,000 kgs of product A and 75,000 of product B at ₹ 15 and ₹ 8 per kgs respectively. The direct material P,Q and R are mixed in the proportion of 3:5:2 in the manufactures of product A. MATERIAL Q and R are mixed in the proportion of 1:2 in the manufacture of product B. The actual and budgeted inventories for the year for the year are given below:

		Opening stock Kgs.	Excepted closing stock kgs	Anticipated cost per Kg. ₹
Material	P	4,500	3,000	6/-
	Q	3,000	6,000	5/-
	R	30,000	9,000	4/-
Material	A	3,000	1,500	-
	B	4,000	5,500	-

Prepare sales budget, production budget and material purchase budget, showing the expenditure for the material for the year ending 31-12-2006.

Solution:

Product A		**Product B**	
EXCEPTED SALE	15000kgs @ ₹ 15 per kg	75,000kgs @ ₹ 15 per kg.	
PQR	3/10: 5/10: 2/10	QR 1/3: 2/3	Requirement

P	13500 × 3/10	= 4,050	P	– = –		4,050
Q	13,500 × 5/10	= 6,750	Q	76,500 × 1/3	= 25,500	32,250
R	13,500 × 2/10	= 2,700	R	76,500 × 2/3	= 51,000	53,700
Production		13,500	Production		76,500	

Production budget = Sales + Closing Stock – Opening stock

Sale	15,000	75,000
ADD: closing stock	1,500	5,500
Less: opening stock	3,000	4,000
Production	13,500	76,500

Material purchase budget = requirement for production = closing stock – opening stock

	P	Q	R	Total
Requirement	4,050	32,250	53,700	-
(+) closing stock	3,000	6,000	9,000	-
(-) opening stock	4,500	3,000	30,000	-
Purchase Quantity	2,550	35,250	32,700	-
×				
Cost per kg	₹ 6	₹ 5	₹ 4	-
Purchase budget (₹)	15,300	1,76,250	1,30,800	3,22,350

Illustration 16:

Calculate the budgted overhead cost per tone at production level of 35 tonne based on following details at 80% capacity (40 tonnes)

	₹ 000
Deprication	22
Indirect labour	24
Insurance	6
Power (80% variable)	40
Repairs and maintenance (50% fixed)	40
Salaries	20
Stores consumable	8

Solution:

Capacity	**100%**		**80%**		**70%**	
Production (tones)	**50**		**40**		**35**	
Variable:						
Stores consumable		10		8		7.0
Semi-variable:						
Power (80% variable)	40		32		28.0	
(20% fixed)	8	48	8	40	8.0	36.0

Repairs and maintenance						
50% variable	25		20		17.5	
50% fixed	20	45	20	40	20.0	37.5
Depreciation		22		22		22.0
Indirect labour		24		24		24.0
Insurance		6		6		6.0
Salaries		20		20		20.0
Total cost		**175**		**160**		**152.5**
Cost per tone (₹)	**₹ 3,500**		**₹ 4,000**		**₹ 4,357.14**	

Illustration 17:

Maya Limited has made the following sales estimates for April, May and June of the year 2005 from which you are required to prepare sales budget by units and rupees for each of the three months for each sale area and in total.

Sales area	April	May	June
A	40%	30%	30%
B	45%	35%	20%
C	40%	35%	25%
D	30%	40%	30%

The area–wise unit sales are excepted as follows:

Sales area	Sales (units)
A	2,500
B	2,000
C	3,000
D	6,000
TOTAL	13,500

The selling price has been fixed at ₹ 6 per unit in area A. ₹ 8 per unit in Area B, ₹ 12 per Unit in area Area D, and ₹ 10 per unit in area C.

Solution:

Sales area	April	May	June	Total
A	1,000	750	750	2,500
B	900	700	400	2,000
C	1,200	1,050	750	3,000
D	1,800	2,400	1,800	6,000
Total	4,900	4,900	3,700	13,500

Sales budget

Sales area	April			May			June			Total		
	U × P.U.=AMT			U × P.U.=AMT			U × P.U.=AMT			U × P.U.=AMT		
A	1,000	6	6,000	750	6	4,500	750	6	4,500	2,500	6	15,000
B	900	8	7,200	700	8	5,600	400	8	3,200	2,000	8	16000
C	1,200	10	12000	1050	10	10500	750	10	7,500	3,000	10	30,000
D	1,800	12	21600	2400	12	28800	1,800	12	21,600	6,000	12	72,000
Total	4,900	-	48800	4,900	-	49400	3,700	-	36,800	13,500	-	1,33,000

Illustration 18: (Flexible budget)

Company ABC Ltd. Produces 10,000 units. The company expenses to 1 unit of the product is listed below:

Direct material - ₹ 7
Direct labour - ₹ 5
Other variable expenses - ₹ 4.5
Administrative overhead - ₹ 6 (40%variable)
Selling overhead - ₹ 3 (75%variable)
Production - ₹ 4 (20% variable)
Purchase of equipment - ₹ 30,000
Selling price - ₹ 120

Prepare budget for 70%, 80% and 100% utilization of the capacity if the details listed above is for 90% utilisation of installed capacity.

Solution:

Level activity	70%		80%		90%		100%	
Units	7,778		8,889		10,000		11,111	
	₹ per unit	Total ₹	₹ per unit	Total ₹	₹ per unit	Total ₹	₹ per unit	Total ₹
Variable cost:								
Direct material	7	54,446.00	7	62,223.00	7	70,000	7	77,777.00
Direct labour	5	38,890.00	5	44,445.00	5	50,000	5	55,555.00
Other variable exp.	4.5	35,001.00	4.5	40,000.50	4.5	45,000	4.5	49,999.50
Administrative overhead	2.4	18,667.20	2.4	21,333.60	2.4	24,000	2.4	26,666.40
Selling overhead	2.25	17,500.50	2.25	20,000.25	2.25	22,500	2.25	24,999.75
Production overhead	0.8	6,222.40	0.8	7,111.20	0.8	8,000	0.8	8,888.80
(A)	**21.95**	**1,70,727.10**	**21.95**	**1,95,113.55**	**21.95**	**2,19,500**	**21.95**	**2,43,886.45**

Fixed cost:								
Administrative	4.62	36,000	4.04	36,000	3.6	36,000	3.24	36,000
Selling overhead	0.96	7,500	0.84	7,500	0.75	7,500	0.67	7,500
Production overhead	4.11	32,000	3.59	32,000	3.2	32,000	2.88	32,000
(B)	**9.70**	**75,500**	**8.49**	**75,000**	**7.55**	**75,500**	**6.79**	**75,000**
Total cost (A+B)	31.65	2,46,227.10	30.44	2,70,613.55	29.5	2,95,000	28.74	3,19,386.45
(+) profit	88.34	6,87,132.90	89.55	7,96,066.46	90.5	9,05,000	91.25	10,13993.55
Selling price	120	9,33,360	120	10,66,680	120	12,00,000	120	13,33,320

Illustration 19: A manufacturer operates three sales divisions X,Y,Z which sell three branded products A, B and C.The budget committee needs a sales budget for the next year from the following information:

Budget sales units for current year:

Product	X	Y	Z
A	80,000	12,000	12,000
B	6,000	16,000	8,000
C	4,000	24,000	10,000

Actual sales units for the current year based on actual sales to the date and estimated sales for the balance of the year are:

Product	X	Y	Z
A	10,000	16,000	14,000
B	4,000	20,000	10,000
C	2,000	20,000	8,000

The selling prices per unit of A, B and C are ₹ 5, ₹ 10 and ₹ 20 respectively applicable for all the divisions.

The discussions with divisional sales managers have product "A" is oversold and if the price is increased by 10%, even then it finds a ready market: product is overpriced and the price of it can be reduces by 5%. By incorporating these changes, the sales will be as follows:

Product	X	Y	Z
A	+30%	+40%	+20%
B	–10%	+30%	–10%
C	+10%	+20%	+10%

You are required to prepare the budget for the current year as well as budget for next year.

Solution:

Sales Budget for the

Divisions		Budget Current Year			Actual Current Year			Budget Next Year		
Sales Area	Brand Product	Unit	*P.U.	=Amount	Unit	*P.U.	=Amount	Unit	*P.U.	=Amount
X	A	80,000	5	4,00,000	10,000	5	50,000	1,04,000	5.5	5,72,000
	B	6,000	10	60,000	4,000	10	40,000	5,400	10	54,000
	C	4,000	20	80,000	2,000	20	50,000	4,400	19	8,600
	Total of X			5,40,000			1,30,000			7,09,600
Y	A	12,000	5	60,000	16,000	5	80,000	16,800	5.5	92,400
	B	16,000	10	1,60,000	20,000	10	2,00,000	20,800	10	2,08,000
	C	24,000	20	4,80,000	20,000	20	4,00,000	28,800	19	5,47,200
	Total of Y			7,00,000			6,80,000			8,47,600
Z	A	12000	5	60,000	14,000	5	70,000	14,400	5.5	79,200
	B	8000	10	80,000	10,000	10	1,00,000	7,200	10.0	72,000
	C	10,000	20	2,00,000	8,000	20	1,60,000	11,000	19.0	2,09,000
	Total of Z	-	-	3,40,000	-	-	3,30,000	-	-	3,60,000
	Total of A	1,04,000	5	5,20,000	40,000	5	2,00,000	1,35,200	5.5	7,43,000
	Total of B	30,000	10	3,00,000	34,000	10	3,40,000	33,400	10.0	3,34,000
	Total of C	38,000	20	30,0004	30,000	20	6,00,000	44,200	19.0	8,39,000
Grand Total		-	-	**15,80,000**	-	-	**11,40,000**	-	-	**19,17,0000**

Illustration 20: ACC Ltd. manufactures two products X and Y and sells them though two divisions: North and south for the submission of sales budget to the budget committee the following information has been made:

Budgeted sales for the current year:

Product	North	South
X	4,000 units at ₹ 9	6,000 units at ₹ 9
Y	3,000 unit at ₹ 24	5,000 unit at ₹ 24

Actual sales for the current year:

Product	North	South
X	5,000 units at ₹ 9	7,000 units at ₹ 9
Y	2,000 unit at ₹ 24	4,000 unit at ₹ 24

Adequate market studies revel that product X is popular but under priced it is observed that if the price of X is increased by ₹ 1 it will still find the read market on the other hand, Y is over price and the market could absorbsed more if sales price of Y be reduced by ₹ 4 the management has agreed to do so.

For the information on this price changes and reports from salesman the following estimates have been prepared by divisional managers.

Percentage increased in sales over current budget

Product	North	South
X	+|10%	+5%
Y	+20%	+10%

Prepare a sales budget, showing budgeted sales and actual sales of the current year as well as budget for the next year:

Sales of budget

Sales division	Product									
		Unit × P.U.=AMT			Unit × P.U.=AMT			Unit × P.U.=AMT		
North	X	4,000	9	36,000	5,000	9	45,000	4,400	10	44,000
	Y	3,000	24	72,000	2,000	24	48,000	3,600	20	72,000
	Total for North			1,8,000			93,000			1,16,000
	X	6,000	9	54,000	7,000	9	63,000	6,300	10	63,000
	Y	5,000	24	1,20,000	4,000	24	96,000	5,500	20	1,10,000
	Total for South			1,74,000			1,59,000			1,73,000
	Total o X	10,000	9	90,000	12,000	9	1,08,000	10,700	10	1,07,000
	Total of Y	8,000	24	1,92,000	6,000	24	1,44,000	9,100	20	1,82,000
Grand Total				**2,82,000**			**2,52,000**			**2,89,000**

Illustration 21: (sales budget)

A marketing company submits the following fig. to the first quarter of 2004

Month	Product soap in units		
	X	Y	Z
January	2,500	3,000	1,000
February	2,000	2,500	1,000
March	3,000	3,500	1,000

Selling price per unit was X ₹ 10, Y ₹ 20 and Z ₹ 40

Target for the first quarter of 2005

Particulars	Product		
	X	Y	Z
Sales Quantity Increases	20%	10%	10%
Sales price increases	Nil	10%	25%

Prepare the sales budget for the first quarter of 2005.

Solution:

Product	January			February			March			Total		
	Units	SP	Amount	Units	SP	Amount	Units	SP	Amount	Units	SP	Amount
X	3,000	10	30,000	2,400	10	24,000	3,600	10	36,000	9,000	10	90,000
Y	3,300	22	72,600	2,750	22	60,500	3,850	22	84,700	9,900	22	2,17,000
Z	1,100	50	55,000	1,100	50	55,000	1,100	50	55,000	3,300	50	1,65,000
Total	-	-	**1,57,600**	-	-	**1,39,500**	-	-	**1,75,700**	-	-	**4,72,800**

Working : product X; sales quantity increases = 20%

January 2,500 + 20% = 3,000

February 2,000 + 20% = 2,400

March 3,000 + 20% = 3,600

Product Y

January 3000 + 10% = 3,300

February 2,500 + 10% = 2750

March 3,500 + 10% = 3,850

PRODUCT Z : Sales quantity increases = 10%

January 1,000 + 10% = 1,100

February 1,000 + 10% = 1,100

March 1,000 + 10% = 1,100

Selling price increases

X 10 + NIL% = 10

Y 20 + 10% = 22

Z 40 + 25% = 50

Illustration 22: (Flexible Budget)

The following information at 50% capacity is given. Prepare a flexible budget and forecast the profit or loss at 60%, 70% and capacity.

	Expenses at 50% capacity (₹)
Fixed Expenses	
Salaries	50,000
Rent and taxes	40,000
Depreciation	60,000
Administrative expenses	70,000
Variable expenses	
Materials	2,00,000
Labour	2,50,000
Others	40,000
Semi – variable expenses	
Repairs	1,00,000
Indirect labour	1,50,000
Others	90,000

It is estimated that fixed expenses will remain constant at all capacities. semi –variable expenses will not change between 45% and 60% capacity, will rise by 10% between 60% and 75% capacity, a further increase of 5% when the capacity crosses by 75%.

Estimated sales:

Capacity	₹
60%	11,00,000
70%	13,00,000
90%	15,00,000

Solution:

Flexible budget

Particulars Capacity levels	50% ₹	60% ₹	70% ₹	90% ₹
Variable expenses:				
Material	2,00,000	2,40,000	2,80,000	3,60,000
Labour	2,50,000	3,00,000	3,50,000	4,50,000
Others	40,000	48,000	56,000	72,000
Total variable exp.	**4,90,000**	**5,88,000**	**6,86,000**	**8,82,000**
Semivariable exp.				
Repairs	1,00,000	1,00,000	1,10,000	1,15,000
Indirect labour	1,50,000	1,50,000	1,65000	1,72,500
Others	90,000	90,000	99,000	1,03,500
Total Semi- variable exp.	**3,40,000**	**3,40,000**	**3,74,000**	**3,91,000**
Fixed expenses				
Salaries	50,000	50000	50,000	50,000
Rent and taxes	40,000	40,000	40,000	40,000
Depreciation	60,000	60,000	60,000	60,000
Administration exp.	70,000	70,000	70,000	70,000
Total Fixed exp.	**2,20,000**	**2,20,000**	**2,20,000**	**2,20,000**
Total cost	10,50,000	11,48,000	12,80,000	
Add/less: profit/loss	N.A	48,000	20,000	14,93,000 7,000
Sales	N.A	11,00,000	13,00,000	15,00,000

Working:

Semi-variable expenses:

At 60% = same as at 50% capacity level

At 70% = 10% increases to given amount at 50% capacity level

Repairs = 1,00,000 + 10% = 1,10,000

Indirect labour = 1,50,000 + 10% = 1,65,000

Others = 90,000 +10% = 99,000

At 90% =15% {i.e. 10% +|5%) increases to given amount at 50% capacity level

Repairs	=	1,00,000 +15%	=	1,15,000
Indirect labour	=	1,50,000 + 15%	=	1,72,000
Others	=	90,000 + 15%	=	1,03,500
Variable expenses:				
Material		At 50%		2,00,000
		60% ?	=	2,40,000
		70% ?	=	2,80,000
		90% ?	=	3,60,000
Labour		At 50%		2,50,000
		60% ?	=	3,00,000
		70% ?	=	3,50,000
		90% ?	=	4,50,000
Others		At 50%		40,000
		60% ?	=	48,000
		70% ?	=	56,000
		90% ?	=	72,000

Illustration 23: (Flexible Budget)

AB Ltd. has furnished the following estimation pertaining to Product "A"at 80% of its normal capacity level for the quarter ending March 31, 2005.

Sales	₹ 6,00,000
Administrative costs :	
Office salaries	₹ 90,000
General expenses	2% of Sales
Depreciation	₹ 7,500
Rates and taxes	₹ 8,750
Selling Costs:	
Salaries	8% of sales
Travelling exp.	2% of sales
Sales office expenses	1% of sales
General office expenses	1% of sales
Distribution Costs:	
Wages	₹ 15,000
Rent	1% of sales
Other expenses	4% of sales

Prepare the budget for the total administration, Selling and Distribution expenses at 70% & 90% capacity levels.

AB Ltd.

Flexible Budget of Product "A"

Particulars Capacity levels		70% ₹	80% Given ₹	90% ₹
Sales	**(A)**	5,25,000	6,00,000	6,75,000
Less: Costs:				
(1) Administrative Costs:				
Office salaries		90,000	90,000	90,000
General expenses (2% of sales)		10,500	12,000	13,500
Depreciation		7,500	7,500	7,500
Rates and Taxes		8,750	8,750	8,750
Total Administrative Costs	**(B)**	**1,16,750**	**1,18,250**	**1,19,750**
(2) Selling costs:				
Salaries (8% of sales)		42,000	48,000	54,000
Travelling expenses (2% of sales)		10,500	12,000	13,500
Sales office expenses (1% of Sales)		5,250	6,000	6,750
General Expenses (1% of sales)		5,250	6,000	6,750
Total Selling Costs	**(C)**	**63,000**	**72,000**	**81,000**
(3) Distribution Costs:				
Wages		15,000	15,000	15,000
Rent (1% of sales)		5,250	6,000	6,750
Other expenses (4% of sales)		21,000	24,000	27,000
Total Distribution Costs	**(D)**	41,250	45,000	48,750
Total Costs (e) = [B+C+D]		2,21,000	2,35,250	2,49,500
Profits (F) = [A-E]		3,04,000	3,64,750	4,25,500

Illustration 24: (Production Budget)

Fun Toys Ltd manufactures a toy monkey with moving parts and a built in voice box. Projected Sales for 5 months are as follows:

Month	Projected Sales in Units
July 2004	4,200
August 2004	4,500
September 2004	4,800
October 2004	4,600
November 2004	4,700

Each toy requires direct material from a supplier at ₹ 3 for moving parts. Voice boxes are purchased from another supplier at ₹ 10 per toy. Labour cost is ₹ 20 per toy and variable overhead cost

is ₹ 5 per toy. Fixed manufacturing overhead applicable to production is ₹ 45,000 per month. It is the practice of the company to manufacture an output in a month which is equivalent to 1.2 times of the following months sales. Prepare the production budget and the production cost budget for July 2004 to October 2004.

Solution:

Fun Toys Ltd.

Particulars	₹ Per unit	₹ Per unit	Total for ------ units ₹ per month
(1) Variable Cst:			
Direct Materials:			
Moving parts	35		
Voice boxes	10	45	
Labour		20	
Variable Overhead		5	
Total Variable cost		70	
(2) Fixed manufacturing overhead			45,000

1. Production Budget

Production during the month = 1.2 times of the following months sales

	Units
July 1.2*August sales 4,500 units	5,400
August 1.2*September sales 4,800 units	5,760
September 1.2*October sales 4,600 units	5,520
October 1.2*November sales 4,700 units	5,640

2. Production cost budget

Production output in units	July 5,400	August 5,760	September 5,520	October 5,640
	₹	₹	₹	₹
(1) Variable Cost:				
Direct Materials:				
Moving parts (₹ 35 p.u.)	1,89,000	201,600	1,93,200	1,97,400
Voice Boxes ₹ (10 p.u.)	54,000	57,600	55,200	56,400
Labour (20 p.u.)	1,08,000	1,15,200	1,10,400	1,12,800
Variable Overhead (₹ 5 p.u)	27,000	28,800	27,600	28,200
Total Variable Cost (₹ 70 p.u.)	3,78,000	4,03,200	3,86,400	3,94,800
(2) Fixed manufacturing overhead	45,000	45,000	45,000	45,000
Total Cost	**4,23,000**	**4,48,200**	**4,31,400**	**4,39,800**

Illustration 25: (Sale Budget)

Prepare an areawise and productwise sales budget for the following data:

Product	Jan	Feb	March
X	500 units	800 units	200 units
Y	1,000 units	1,100 units	1,500 units

Sales area	Product	January			February			March				
		Unit	SP	amt	unit	SP	amt	unit	SP	amt	unit	amt
A	X	100	5	500	160	5	800	40	5	200	300	1,500
	Y	300	10	3,000	330	10	3,300	450	10	4,500	1,080	10,800
Total of area A		-	-	3,500	-	-	4,100	-	-	4,700	-	12,300
B	X	150	5	750	240	5	1,200	60	5	300	450	2,250
	Y	700	10	7,000	770	10	7,700	1050	10	10,500	2,520	25,200
Total of area B		-	-	7,750	-	-	8,900	-	-	-	-	27,450
C	X	250	5	1,250	400	5	2,000	100	5	500	750	3,750
	Y	-	10	-	-	10	-	-	10	-	-	-
Total of area C		-	-	1,250	-	-	2,000	-	-	500	-	3,750
Total of X		500	5	2,500	800	5	4,000	200	5	1,000	1,500	7,500
Total of Y		1,000	10	10,000	110	10	11,000		10	15,000	3,600	36,000
Grand Total		-	-	12,500	-	-	15,000	-	-	16,000	-	43,500

Exercise

1. The Bright Ltd. manufactures two brands of pen – one sold under the name of 'bright' and another under name of 'hans'. The sales department of the company has three departments in different areas of country.

   The sales budget for the year ending 31st December, 2015 were:

   Bright

   Department I 3,00,000

   Department II 5,62,500

   Department III 1,80,000

   Hans

   Department I 4,00,000

   Department II 6,00,000

   Department III 20,000

   Sales prices are ₹ 3 and ₹ 1.20 in all departments.

It is estimated that by forced sales promotion the sale of 'Hans' in department I will increase by 1,75,000. It also expected that by increasing production and arranging extensive advertisement department III will be enabled to increase the sale of 'Hans' to 50,000.

It is recognised that the estimated sales by department II represent an unsatisfactory target. It is agreed to increase both estimates by 20%.

Prepare a sales budget for the year to 31st December, 2015.

2. The sales director of a manufacturing company reports that next year he expects to sell 54,000 units of a certain product.

The production manager consults the shopkeeper and casts his figure as follows:

Two kinds of raw material, A and B, are required for manufacturing the product. Each unit of the product required 2 units of A and 3 units of B. The estimated opening balances at the commencement of the next year are:

Finished : 10,000 units

A : 12,000 units

B : 15,000 units

The desirable closing balance at the end of the next year are:

Finished products : 14,000 units

A. : 13,000 units

B. : 16,000 units

Draw up a quantitative chart showing the material purchase budget for the next year.

3. It is estimated that on 1st January, 2015 the Alpha Manufacturing Co. Ltd. will have the following raw material inventory:

Type of materials	Quantity	Price (₹)	Amount (₹)
L	700	3	2100
M	15 tons	35	525
N	1500 kg.	0.75	1125
O	800 gallons	1.00	800
P	10,500	0.20	2100
			6650

The management summarised the consumption of different types of raw material for various departments in the following manner:

Materials	I	II	III	IV
L units	4500	–	3000	500
M tons	11	3	–	4
N kg	–	600	700	1350
O gallons	350	700	–	–
P units	5600	6300	1500	800

The following inventory at 31st December, 2015 is desired:

L : 800 M : 7 tons

N : 1050 kg. O : 750 gallons

P : 600

Assuming that all prices will remain constant, prepare the purchase budget.

4. The golden company plans to sell 1,08,000 units of a certain product line in the first fiscal quarter 1,20,000 units in the second quarter 1,32,000 units in the third quarter and 1,56,000 units in the fourth quarter and 1,38,000 units in the first quarter of the following year. At the beginning of the first quarter of the current year there are 18,000 units of product in the stock. At the end of each quarter, the company plans to have an inventory equal to one sixth of the sales of the sales for the next fiscal year.
5. Shangrilla Foods Products Limited has prepared the following sales budget for the first five Year months of 2015.

   Sales budget (in units)

January	10,800
February	15,600
March	12,200
April	10,400
May	9,800

   The inventory of finished products at the end of every month is to be equal to 25 per cent of the sales estimate for the next month. On 1st January, 2010 there were 2,700 units of product on hand. There is no work in process at the end of any month.

   Every unit of product requires two types of materials in the following quantities:

   Material A : 4 kg, Material B : 5 kg

   Material equal to one half of the next month's production are to be in hand at the end of every month. This requirements was met on 1st January, 2015.

   Budgeted prices of the purchase of materials are:

   Material A : ₹ 3 per kg., Material B : ₹ 2 per kg.

   Prepare a material budget for the first quarter of 2015 in a logical form showing the quantities of each type of material to be purchased every month. Also prepare a purchase budget.
6. The following are the estimated sales of a company for eight months ending 30th October 2015.

Months	**Estimated sales (units)**
April 2015	12,000
May 2015	13,000
June 2015	9,000
July 2015	8,000
Aug 2015	10,000
Sept. 2015	12,000
Oct. 2015	14,000
Nov. 2015	12,000

   As a matter of policy the company maintain the closing balance of finished goods and raw materials as follows:

   Stock item. Closing balance of month

Finished goods 50% of the estimated sales for the next month

Raw materials estimated consumption for the next month

prepare production budget (in units) and raw material purchase budget (in units and cost) of the company for the half year ending 30th September 2015.

Questions for Self-practice

I. Short Question

1. What is a budget?
2. Who decides the budget period?
3. What is budget period?
4. What is the use of a budget?
5. What is budget manual?
6. Give one function of budget committee?
7. What is the basis of sales budget?
8. Mention any two factors which decides production budget?
9. What is flexible budget?
10. Why is budget controller appointed?

II. Short Notes

1. Budgetary Control
2. Objectives of Budgetary Control
3. Budget Key Factor
4. Flexible Budget
5. Master Budget

Objective Questions

I. Fill in the Blanks

1. Budget is drawn for _____.
2. Key factor is also known as _____.
3. _____ requires classifications of cost as fixed, variable and semi-variable.
4. Flexible budget is drawn for _____ level of activity.
5. _____ budget is prepared for a longer period.
6. _____ is a summary of all the functional budgets.
7. _____ shows estimate of sales in future.
8. Flexible budget is useful for _____.
9. Budget defines _____ of a concerned manager.
10. _____ shows budgeted receipts and payments.

[**Ans.:** 1. Future, 2. Limiting factor, 3. Flexible budget, 4. Fixed, 5. Capital, 6. Master budget, 7. Sales budget, 8. Control, 9.Responsibility, 10. Cash budget.]

II. True or False

1. Budget is prepared for the future period.
2. The scarce factor of production is known as key factor.
3. Flexible budget is drawn for one level of activity.
4. Flexible budget is drawn for multiple levels of activities.
5. A budget is expressed in financial terms only.
6. Capital expenditure budget is prepared for a longer period.
7. Master budget is a summery of all the functional budgets.
8. Budget period depends on management policy.
9. Production budget is expressed in quantity and cost.
10. Sales budget is prepared by production manager.

[**Ans.:** True: (1, 2, 6, 7, 8, 9), False: (3, 4, 5, 10).]

III. Match the Columns

Group 'A'	**Group 'B'**
1. Budget	(i) Future oriented
2. Key factor	(ii) Drawn for one level
3. Fixed budget	(iii) Drawn for multiple levels
4. Flexible budget	(iv) Limiting factors
5. Master budget	(v) Summary of all functional budgets
6. Budgetary control	(vi) Estimates of sales
7. Sales budget	(vii) Estimate of production
	(viii) Control through budgets

[**Ans.:** 1. (i), 2. (vi), 3. (ii), 4. (iii), 5. (v), 6. (viii), 7. (vi).]

IV. Multiple Choice Questions

1. One of the following is not a basic element of a budget:
   (a) Defines the responsibility of each employee (b) Comprehensive plan
   (c) Expressed in financial terms (d) Future plan for a specified period
2. Information to prepare flexible budget includes:
   (a) Total fixed cost, total variable cost
   (b) Total fixed cost, total variable cost and capacity
   (c) Total fixed cost, variable cost per unit and several levels of activity.
   (d) None of the above
3. Flexible budget are useful for
   (a) Planning purpose only
   (b) Planning, performance evaluation & feedback control
   (c) Control of performance only
   (d) None of the above

4. A flexible budget takes into account
   (a) Fixed cost only
   (b) Variable cost only
   (c) Semi-variable cost only
   (d) Fixed, variable and semi-variable cost
5. A budget is prepared for
   (a) One year
   (b) One month
   (c) 6 months
   (d) A specified period
6. Master budget is a summary of
   (a) Cash budget
   (b) Sales budget
   (c) Production budget
   (d) All functional budget
7. Budget period depends on
   (a) Type of budget
   (b) Management policy
   (c) Government policy
   (d) None of the above
8. Budgetary control system is costly for
   (a) Large organisation
   (b) Small organisation
   (c) Public sector oorganisation
   (d) None of the above
9. Production budget is expressed in
   (a) Quantity only
   (b) Cost only
   (c) Quantity and cost
   (d) None of the above
10. Sales budget shows
   (a) Estimate of future sales
   (b) Estimate of future production
   (c) Estimate of inventory
   (d) None of the above

[**Ans.:** 1. (a), 2. (c), 3. (b), 4. (d), 5. (d), 6. (d), 7. (b), 8. (b), 9. (a), 10. (a).]