ACKNOWLEDGEMENT

We gratefully acknowledge permission to quote from past examination papers of the following bodies: **Kenya Accounts and Secretaries National Examination Board (KASNEB); Chartered Institute of Management Accountants (CIMA); Chartered Association of Certified Accountants (ACCA)**

Instruction for Students

This study guide is intended to assist distance-learning students in their independent studies. In addition, it is only for the personal use of the purchaser, see copyright clause. The course has been broken down into Eight lessons each of which should be considered as approximately one week of study for a full time student. Solve the reinforcement problems verifying your answer with the suggested solution contained at the back of the distance learning pack. When the lesson is completed, repeat the same procedure for each of the following lessons.

At the end of lessons 2, 4, 6 and 8 there is a comprehensive assignment that you should complete and submit for marking to the distance learning administrator.

Submission Procedure

1. After you have completed a comprehensive assignment clearly

identify each question and number your pages.

2. If you do not understand a portion of the course content or an assignment question indicate this in your answer so that your marker can respond to your problem areas. Be as specific as possible.
3. Arrange the order of your pages by question number and fix them securely to the data sheet provided. Adequate postage must be affixed to the envelope.
4. While waiting for your assignment to be marked and returned to you, continue to work through the next two lessons and the corresponding reinforcement problems and comprehensive assignment.

On the completion of the last comprehensive assignment a two-week period of revision should be carried out of the whole course using the material in the revision section of the study pack. At the completion of this period the final Mock Examination paper should be completed under examination conditions. This should be sent to the distance-learning administrator to

arrive in Nairobi at least five weeks before the date of your sitting the KASNEB Examinations. This paper will be marked and posted back to you within two weeks of receipt by the Distance Learning Administrator.

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Costing Course Description

The course aims at developing the candidates understanding and application of costing and budgeting concepts and techniques to organisations.

According to the syllabus you should be able to determine the costs of various products and services , prepare budgets for various purposes and evaluate the performance of organisations as well as decision making techniques trhough analytical techniques.

The core areas of the syllabus are cost accumulation and decision making. There will always be exam questions on this core area so the student is advised to practice as many questions as possible.

The student has continuous opportunity to test his understanding by completing the reinforcing questions and checking his answers with those given in the revision section.

Ensure that you do all the questions because costing is learnt by doing.

Recommended Study Texts:
Cost and Management Accounting : G. Brown

Costing Index

Lesson One Introduction
Reinforcing Questions
Lesson Two Cost estimation and forecasting
Reinforcing Questions
Comprehensive
Assignment 1
Lesson Three Cost accumulation, Accounting for materials, labor and overheads
Reinforcing Questions
Lesson Four Book keeping entries: Integrated and interlocking systems
Reinforcing Questions
Comprehensive
Assignment 2
Lesson Five Decision-making
Reinforcing Questions

Lesson Six Costing Methods; Job costing, contract costing and Process cositng

Reinforcing Questions

Comprehensive Assignment 3

Lesson Seven Budgets

Reinforcing Questions

Comprehensive Lesson Assignment 4

Lesson Eight Standard Costing

Lesson Nine KASNEB Syllabus. Model answers to reinforcing questions. Selected past papers with model answers. Work through model; answers ensuring they are understood. On completion submit final assignment to Strathmore University.

FINAL ASSIGNMENT

Mock Examination

LESSON ONE

NATURE AND PURPOSE OF COST ACCOUNTING

OBJECTIVES

. When you have studied this lesson, you should be able to:

- Understand the nature of cost accounting especially its cost center approach to accounting for resources used.
- Explain the relationship between cost accounting and other closely related business subjects such as financial accounting, and management accounting.
- Understand the role played by cost accounting in a business organization.

CONTENTS

The nature and purpose of Cost Accounting.

- Definition of cost accounting
- Introduction to Cost accounting terminology
- The purpose of cost accounting information
- The relationship between cost accounting and other accounting disciplines
- Design and operation of cost and management accounting systems.
- Qualitative and quantitative information in accounting information systems

Reinforcement Questions 1

1. NATURE AND PURPOSE OF COST ACCOUNTING

The Nature of Cost Accounting

Cost accounting has been defined by many accounting scholars in various forums. There is no one watertight definition of cost accounting, but the various definitions all point to certain common aspects about the subject. Below are some definitions by certain authorities :

> “That part of management accounting which establishes budgets and standard costs and actual costs of operations, processes, departments or products and the analysis of variances, profitability or social use of funds” (Chartered Institute of Management Accountants - CIMA)

> “That which identities, defines, measures, reports and analyses the various elements of direct and indirect costs associated with producing and marketing goods and services. Cost accounting also measures performance, product quality and productivity” (Letricia Gayle Rayburn)

> “A systematic process of collecting, summarizing and recording data regarding the various resources and activities in a firm so as to calculate the basis of production costs used in financial accounting or making other relevant decisions in a firm (Horngren C.T)

Cost accounting is broad and extends beyond calculating production costs for inventory valuation, which government-reporting requirements largely dictate. However accountants do not allow external reporting requirements to determine how they

measure and control internal organizations activities. In fact, cost accounting focus is shifting from inventory valuation for financial reporting to costing for decision making.

The main objective of cost accounting is communicating financial information to management for planning, evaluating and controlling performance, and also to assist management to make more informed decisions. Its data is used by managers to guide their decisions.

Cost Accounting and other Accounting Subjects:

Accounting can be described as a specialized information system that is used for purposes of decision making by the management of the organization and other users such as tax authorities, investors, creditors

and the general public. Accounting is broadly divided into two:

i. Financial Accounting

ii. Management Accounting

Financial Accounting:

This is the analysis, classification, and recording of financial transactions and the ascertainment of how such information will be reported to the various users. It involves the development of **general-purpose** financial statements largely for **external reporting**. These statements are developed in accordance with standards imposed by the public (through the professional accounting bodies such as the Institute of Certified Public Accountants of Kenya – ICPAK and the International Accounting Standards Board – IASB) as well as the requirements of the Companies Act Chapter 486.

Management Accounting:

This is the part of accounting that provides **special-purpose** statements and reports to management and other persons inside the organization. The information generated by management accounting is therefore for internal uses and is not guided by any standards or legal requirements. Management Accounting, unlike financial accounting, is proactive i.e. it is future-oriented. It is required in making decisions that affect the organization.

In a nutshell, cost accounting enables a business to not only find out what various jobs or processes have cost, but also what they should have cost. It indicates where losses are occurring before the work is finished and therefore corrective action can be undertaken.

From the foregoing discussion, it is then clear that cost accounting is very closely related to other accounting subjects especially management accounting. In fact, most people make no distinction between management accounting and cost accounting, as the dividing line between the two is slimmer than thin!

The relationship of cost accounting and other accounting disciplines

1.21 Relationship between cost accounting and management accounting

Referring to CIMA's definition of cost accounting, we can see that cost accounting is a part of management accounting.

CIMA defines management accounting as "provision of information required by the management for such purposes as

formulation of policies, planning and controlling the activities of the enterprise, decision taking on the alternative courses of action, disclosure to those external to the entity (shareholders and others), disclosure to employees and safeguarding assets. Cost accounting and management accounting have basically the same functions.

1.22 Relationship of cost accounting and financial accounting

The difference between cost and management accounting may be highlighted using a number of questions namely;

a) Are there any unifying concepts to which enterprises will adhere?

For financial accounting the answer is “YES”. There are a number of accounting standards

that are followed in producing accounting information. These are procedures established by the accounting profession to standardize and improve accounting methods and disclosure. For example, the International Accounting Standard No. 1 singles out for mention fundamental accounting concepts namely going concern, accruals and consistency.

For cost accounting and management accounting the answer is NO. However, there are a number of techniques, which are widely used e.g. budgeting, standard costing, marginal costing and cost-volume-profit analysis.

b) May management choose whether or not to use the discipline?

The Companies Act requires a number of accounting records which by statute must be kept and made available. For a limited company, financial statements must be produced which in the opinion of the auditors, provide a true and fair view of the company's affairs and comply with the Companies Act, Cap 486, 1962.In the case of cost and management accounting, the management of an enterprise may choose whether or not to create a cost and management accounting department and the extent to which any such department will be used.

c) To what extent is the focus on segments of the enterprise?

In financial accounting, the main emphasis is on the performance of the business entity. The

balance sheet is viewing the state of the business at a specific point in time expressed in monetary terms. The profit and loss account is comparing the revenue and expenses of the business for a specific period. Cost and management accounting will focus analysis by segments of the business in order to allow examination by job, process, product or service.

d) To what extent does the analysis of information incorporate non-monetary measures?

In financial accounting the monetary base is predominant. Non-monetary measures are used in the interpretation of accounting statements. For example expressing net profit as a percentage of sales revenue.

In cost and management accounting there will be greater use of non monetary measures. Quantitative information may be useful in areas such ass material losses (kilos or as a percentage input), machine efficiency (as a percentage of a predetermined standard).

e) To what extent is the emphasis on future trends?

In financial accounting there is the statutory requirement for provision of historical data from which accounting statements may be prepared.

Such statements may be used in the forecasting of future trends for use by potential investors or investment analysts

Cost and management accounting will tend to focus more on the future although analysis of historical information will be used. For example budgeting will focus on future plans but to some extent will use past performance as a guide to the structure of such plans

f) What Degree of accuracy is required in the information analysis?

Basic financial accounting records must record transactions involving cash to

the nearest cent. There will be an element of judgment however in areas such as provision for depreciation of fixed assets or valuation of stock and debtors.

Cost and management accounting information will tend to be as accurate as required in a given situation e.g. Management Reports may summarize figures to the nearest thousand shilling whereas the labour cost per product may be expressed to four decimal places.

g) Is accounting a means to an end or an end in itself?

Financial accounting is **an end in itself** in so far as it fulfils the statutory requirements in relation to accounting records and the publication of financial accounting statements. It is also a means to an end in that it provides an overview of the

business which may be interpreted by the various users of accounting information which the Companies Act seeks to protect.

Cost and management accounting is a **means to an end**. It may be used to assist management in future planning, control and decision making required for the efficient implementation of the objectives of the enterprise and the strategies which will best lead to achievement of these objects.

1.2 Introduction to Cost Accounting Terminology

a) Cost

It measures the economic sacrifice made to achieve an organizations goals. For a product, cost represents the monetary measurement of

resources used such as materials, labour and overheads.

For a service, cost is the monetary sacrifice made to provide the service. Accountants generally use cost with other descriptive terms, for example, historical, product, prime, labour or material. Each of these terms defines some characteristic of the cost measurement process or an aspect of the object being measured.

b) Cost Units

It is the quantitative unit of the product or service in relation to which costs are ascertained. The cost unit will be determined by the nature of the business enterprise. It may be

- An individual job, batch or contract
- A unit of production expressed as a relevant quantity
- A service is provided to the customer

c) Cost Accountant

Is a member of chief accounting officers department. He is responsible for collecting product costs and preparing accurate and timely reports to evaluate and control company operations. Cost accountants assemble, classify and summarize financial and

economic data on the production and pricing of goods and services

d) Cost Analysis

Is an activity that uses engineering, time and motion studies, timekeepers records and planning schedules from production supervisors. Cost analysis techniques include break even analysis, comparative cost analysis, capital expenditure analysis and budgeting techniques. After determining what is actually happening, accountants should identify available alternatives. Professional judgment is then needed to apply and interpret the results of each costing technique.

e) Cost benefit approach

Is the primary criterion for choosing among alternative accounting approaches. In a company, there is a direct

relationship between the amount of time and the funds management is willing to spend on cost analysis and the degree of reliability desired. If a company wants detailed records with a high degree of accuracy, managers should provide additional time and money for compiling and maintaining cost information. Managers should only use cost analysis and control techniques when anticipated benefits in helping achieve management goals exceed the cost.

Purpose of Cost Accounting Information

Cost accounting is utilized for a number of purposes, some of which are briefly described in the following points :

a) Accounting for costs

This may be seen as a record keeping or score keeping role. Information must be gathered and analyzed in a manner which will help in planning, control and decision making

b) Planning and Budgeting

This involves the quantification of plans for the future operations of the enterprise; such plans may for the long or short term, for the enterprise as a whole or for the individual aspects of the enterprise.

c) The control of the operations of the enterprise

Control may be assisted by the comparison of actual cost information with that included in the plan. Any differences between planned and actual events can be investigated and corrective action implemented as appropriate

d) Decision Making

Cost accounting information assists in the making of decisions about the future operations of the enterprise; such decisions making may be assisted by the information from cost techniques and cost-volume – profit analysis.

e) Resource allocation decisions

For example product pricing in determining whether to accept or reject jobs: This is based on cost and revenue implications of the relevant decisions

f) Performance evaluation

Cost accounting information is used to measure and evaluate actual performance so as to make a decision of the degree of optimality or efficiency of resource utilization.

The role of a cost accounting department in an organization

As part of their jobs, cost accountants interpret results, report them to management and provide analysis that assist decision-making in the following departments:

a) Manufacturing

Cost accountants work closely with production personnel to measure and report manufacturing costs. The efficiency of the production departments in scheduling and transforming materials into finished units is evaluated for improvements.

b) Engineering

Cost accountants and engineers translate specifications for new products into estimated costs; by comparing estimated costs with projected sales prices, they help management decide whether

manufacturing a product will be profitable.

c) Systems design

Cost accountants are becoming more involved in designing computer integrated manufacturing (CIM) systems and databases corresponding to cost accounting needs. The idea is for cost accountants, engineers and system designers to develop a flexible production process responding swiftly to market needs

d) Treasury

The treasurer uses budgets and related accounting reports developed by cost accountants to forecast cash and working capital requirements. Detailed cash reports indicate where there are excess funds to invest or where cash deficits exist and need to be financed.

e) Financial accounting

Cost accountants work closely with financial accountants who use cost information in valuing inventory for external reporting and income determination purposes.

f) Marketing

Marketing involves the cost accountant during the product innovation stage, the manufacturing planning stage and the sales process. The marketing department develops sales forecast to facilitate preparing a products manufacturing schedule. Cost estimates, competition, supply, demand, environmental influences and the state of technology determines the sales price that the product will be offered and will command in the market.

g) Personnel

Personnel department administers the wage rate and pay methods used in calculating each employees pay. This department maintains adequate labour records for legal and cost analysis purposes.

At this point, it cannot be over-emphasized that cost accounting is simply an information system designed to produce information to assist the management of an organization in planning and controlling the organisation's activities. It also assists the management to make informed decisions so as to enable the organization to operate at maximum effectiveness and efficiently.

Role of Cost Accounting In business management

A system is a set of interdependent parts which together form a unitary whole that performs some functions. A number of sub systems make up the whole. In this context of the organization, a management information system may be seen as the overall system with a number of sub systems including the cost and management accounting system that provide the information to management for purposes of planning, organizing, directing and controlling the organization's activities so as to achieve corporate goals including profit maximization.

Information must be collected, processed and communicated in an organized manner if the objectives of the enterprise are to be efficiently implemented and alternative strategies for their implementations examined, so as to select the best strategy.

Information may be non mutually exclusive in nature. This means that information gathered as part of the management information system may be used in two or more subsystems for differing purposes. An example of this information is with regard to the amount and location of work in progress: (work in progress refers to partly completed units of products where a product passes through a number of operations and processes before being passed into finished goods store or to the customer). Work in progress information may be used by:

a) **Production planning department** in order to monitor the progress of parts of an order through the production process and to instigate action to speed up the completion of slow moving parts of the order

b) **Quality control department** in comparing one batch of product with another in highlighting the incidence of process losses and their location

c) **Cost management department** in the quantification and valuation of actual loses as compared to the level originally allowed for in the business plan

d) **Financial accounting department** in the valuation of work in progress for balance sheet purposes and for purposes of determining the cost of sales in the income statement.

Business Management involves planning, organizing, staffing, directing and controlling an organization's activities so as to meet a specified objective, usually profit maximization. The function of managing a business's activities is

entrusted to the managers of the business. For the managers to maximize profits, they must minimize the entire business's cots. They therefore need to track all costs as they are incurred and recovered via the organization's activities. To get this information as it happens (LIVE), they need an effective an efficient 'information system' referred to as cost accounting. It will therefore be appreciated that if an organization's cost accounting information system fails, the managers cannot manage it efficiently and effectively.

Design and Operation of Cost and Management Accounting Systems

A number of features must be taken into account before finalizing the design of a cost and management accounting system. These are

a) Nature of the business enterprise

b) The accounting techniques and methods which will be of use

c) Volume and type of information which will be needed

d) The method of recording, processing and communicating information.

1.7.1 The relationship between the nature of the Business Enterprise and Cost Accounting

Cost accounting, as will be mentioned later, adopts a cost center approach to accounting for costs. A **cost center** is any entity in the organization with respect to which costs can be identified and accumulated; it could be a physical entity such as a product, a geographical entity such as a division or region, or it could be conceptual entity such as a department.

The relationship between cost accounting and the nature of the business stems from the fact that the accumulation of costs into cost centers is fully dependent on the nature of the business enterprise. What is a cost center in one business enterprise may not be a cost center in another business enterprise.

The business enterprise may be such that

a) Individual orders are received from customers for work which is undertaken according to the specific requests of the customer (specific order costing)

b) Output is the result of a series of continuous operation or processes (process costing)

c) A service is provided to the customer (operation/service costing)

A **cost unit** may be defined as the quantitative unit of product or

service in relation to which costs are ascertained. The cost unit will be determined by the nature of the business enterprise. It may be:

i) An individual job or batch

ii) A unit of production expressed as a relevant quantity e.g. Kilogram litre e.t.c.

iii) A Unit of service e.g. patient day in hospital or graduate in a higher educational establishment.

The costing and management accounting system is designed and operated such that costs can be identified and accumulated for each unit of output. The costs are then accumulated for the various cost centers and further analysis done to produce useful information for planning, controlling, decision-making and performance evaluation.

1.7.2 Accounting techniques and methods:

In order to enable cost and management accounting to fulfill its role as an aid to planning, control and decision making, a number of techniques and methods have evolved. The main ones include:

a) Budgetary planning and control

A budget is a plan of action expressed in monetary terms. It is therefore a quantified plan of what one intends to do.

All business should prepare a budget which is a document that:

1. Quantify the strategy which management have decided to implement in order to achieve the business objectives for a future period. The budget will show planned income and expenditure and may be analysed to include

details for each product type and department;

2. Provide a base for control cycle; The control cycle is as follows:

- Establish the budget or plan
- Measure actual performance
- Compare plan with actual performance
- Take corrective action as required

3. Provide a mechanism by which management responsibility may be matched with the budgetary information and assisted by the budgetary control cycle.

b) Standard Costing and variance analysis

Standard costing is defined by CIMA as a technique which uses standards for costs and revenues for the purpose of control

through variance analysis. CIMA also defines a standard costs. In this text, we will restrict ourselves to CIMA's definition of a standard cost

Standard cost is defined as 'predetermined calculation of how much costs should be under specified working conditions.

Standard costing and variance analysis is a technique used by management accountants in the implementation of their service to management in the areas of planning, control and decision making in the following ways:-

- As a planning aid, standard costs provide useful building blocks in the preparation of budgets for departments products and cost
- As a control aid, standard costs provide data which show where the deviation

from the plan have arisen and where corrective action by management is required

- As a decision making aid, standard costs may be used in building up estimated cost data for new products in order that decisions may be made about factors such as the likely price at which the product should be marketed.

1.7.3. Quantitative and Qualitative information in accounting systems

The availability of information is the lifeblood of any cost and management accounting system. It is vital that input information is properly controlled in order that output information is useful. Such information must be relevant for management's planning, control and decision making purposes.

The information used in costs and management accounting may be quantitative or qualitative.

Quantitative is that which may be measured in monetary terms or other physical units e.g. material may be expressed as Shs. 1000 or 250 kilos. It is easily objectively expressed.

Qualitative information is that information that cannot be objectively expressed. It is therefore very difficult to quantify such information and for this reason, it is largely subjective, for example, a comment by management about the improved employees morale resulting in increased profits- it is hard to express the improved employees morale in monetary(quantified) terms. It is difficult or impossible to objectively quantify qualitative information.

Cost accounting mainly utilizes quantitative information while financial accounting utilizes purely

quantitative information. Management accounting utilizes a mixture of the two but the information is still mainly quantitative.

Managers use both qualitative and quantitative information. The accounting system is the main source of qualitative information.

1.7.4 Accounting records

The quantitative information utilized in the cost and management accounting systems can be obtained from either or both of two accounting records sets, normally referred to as ledger systems.

These are

a) **Interlocking ledger system**; this is use of separate cost and financial ledger systems to meet the individual needs of cost/management accountants

and financial accountants respectively.

b) **Integrated ledger system:** Use of single unified ledger system, which serves the needs of both cost and management accounting and financial accounting. It meets the information needs of both cost/management accountants and financial accountants simultaneously.

This topic is covered in details under cost book keeping in lesson 4 of this book.

1.8 A Cost Center Framework/Approach in Cost Accounting

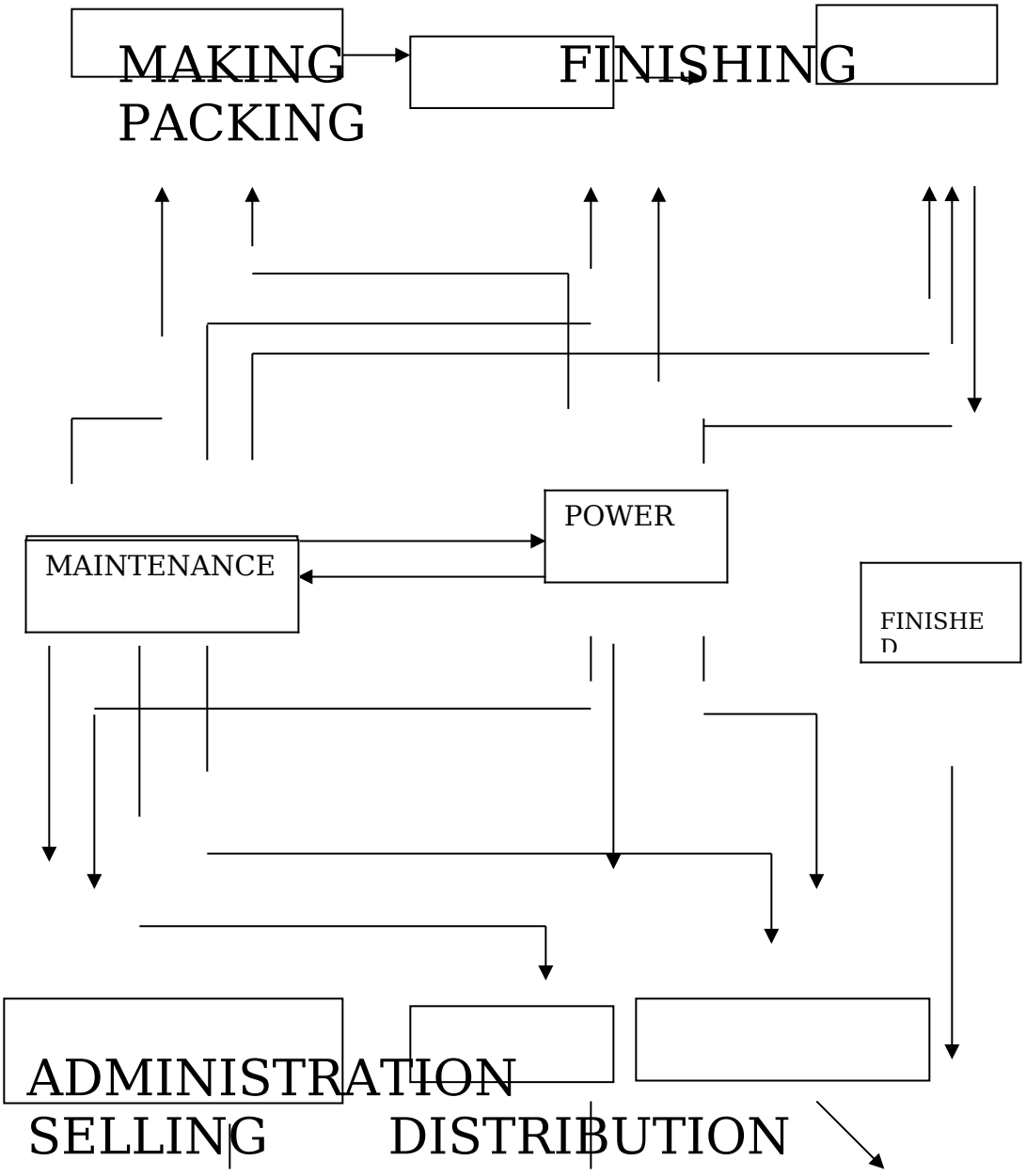
Cost accounting is based on the concept or framework of cost centers, i.e. all the costs incurred during the production process have to be identified and accumulated around certain points of the

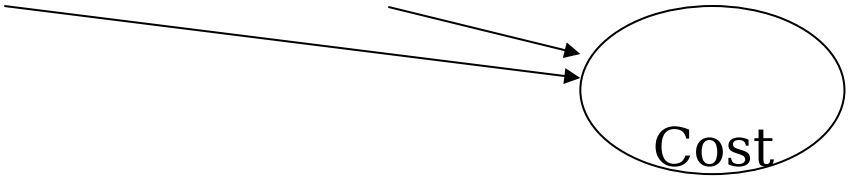
production process, referred to as cost centers.

A cost center may be defined as ‘any point at which costs are gathered in order to control cost, fix responsibility and enable costs to be recharged on an equitable basis. We will use a cost flow diagram to illustrate the principles of a cost center framework

Each rectangular box represents a cost center. Each cost will be the responsibility of one management member and will have costs charged to it and also costs recharged from it if such costs are incurred for purposes of offering a service to other cost centers.

Fig 1.1 Cost flow diagram of a typical manufacturing concern (Organization):





of sales

Note

There are three manufacturing centres (Making, Finishing and Packing). These are supported by five support departments, namely Maintenance, Power, Administration, Selling and Distribution. All the various costs incurred in those departments produce the cost of sale of the finished product that is offered for sale in the market. It is possible that some departments reciprocally support each other, for example, in the above diagram, the power department provides power to the maintenance department; in return, the maintenance

department maintains the power department.

The departments can be viewed as cost centres as we can identify and accumulate costs in regard to them. Also, the finished products could be viewed as cost centres under the same logic.

Now, is a student a cost centre? The answer is yes as cost can be identified and accumulated per every student served

Summary of features of an effective cost center framework

In establishing cost centers, an organization should consider the following points:

a) Clear definition of the cost center boundaries. This should ensure that there's no overlapping of the boundaries defined in two or more centers and no gaps where some aspect

of the business which incurs cost is not contained in a cost center.

b) A clear link with the manager responsible so as to hold someone responsible for the costs incurred in a cost centre.

c) Costs should be analyzed into clearly defined categories in order to ensure that planned and actual expenditure may be analyzed in the same way.

d) The cost centres should enable the effective and efficient planning, directing and control of the organization’s activities, thereby enabling it achieve its objectives.

REINFORCING QUESTIONS

1. Define the following terms
   a) Cost Accounting
   b) Financial Accounting
   c) Management accounting

2. Briefly describe the purpose of Cost Accounting.
3. Compare and contrast Cost Accounting and financial Accounting

CHECK YOUR ANSWERS WITH THOSE GIVEN IN LESSON 9 OF THE STUDY PACK

LESSON TWO

COST CLASSIFICATION AND ESTIMATION

OBJECTIVES

By the end of this lesson you should be able to:

- Explain and discuss basis of Cost classification
- Explain and discuss methods of cost estimation
- Perform computations

CONTENT

a. Classification defined
b. The purpose of cost classification
c. Methods of cost classification

Manufacturing versus non-manufacturing costs

Behavioral classification of costs:

a. Variable versus fixed,

b. Direct versus indirect costs
c. Controllable versus non-controllable costs

Functional classification of costs:
Production, administration, selling and distribution

Cost Estimation

Purpose of cost-estimation

Methods of cost estimation

a. High-low,
b. Account analysis,
c. Engineering,
d. Visual fit and
e. Simple linear regression analysis
f. Learning curve Theory.

Reinforcement Questions 2
Comprehensive Assignment 1

INSRUCTIONS

- Read the study pack text
- Do the reinforcing questios and compare you answers with those given in lesson 9

- Complete the comprehensive Assignment

2 Cost Classifications and Estimation

2.0 Introduction

Cost classification may be defined as ‘the arrangement of cost items in a logical sequence having regard to their nature and purpose to be fulfilled’. The term cost must be qualified when in use in order that its precise meaning is established in a particular situation; however, cost refers to the amount of resources that have been diverted from other uses or sacrificed so as to achieve the desired objective. But the term is used to refer to various aspects of cost, depending on the base of argument that one is approaching the issue from.

Different bases are used in classifying costs, thus giving us several types of costs. We look at these bases in the following sections.

Cost Classification bases

Costs can be classified on either one or more of the following bases:

a) Are the costs dependent on the level of output (variable) or are the costs the same irrespective of the level of output (fixed)?

b) Have the costs already been incurred (sunk) or are they going to be incurred in the future depending on what we decide (incremental) ?

c) Are they already incurred (sunk/historical) or are the costs due to a benefit foregone for not taking a certain option (opportunity cost)?

d) Are we in a position to decide not to incur the costs (avoidable) or are we bound to incur them by authorities we are subject to such as higher managers and the government (unavoidable)?

e) Are the costs actually incurred (actual) or are they the expected as per the expenditure guidelines set by the management (standard)?

f) Can we be able to control the costs , for example , by varying the level of output or by making appropriate decisions (controllable costs) , or are the costs beyond us because they are fixed or the decisions are made by higher authorities (uncontrollable)?

g) Can we trace the exact costs incurred to the final product (direct costs) or can we not, may be only estimate such costs (indirect costs)?

h) What is the function that makes the costs to be incurred in the organization, is it production, administration or selling and distribution?

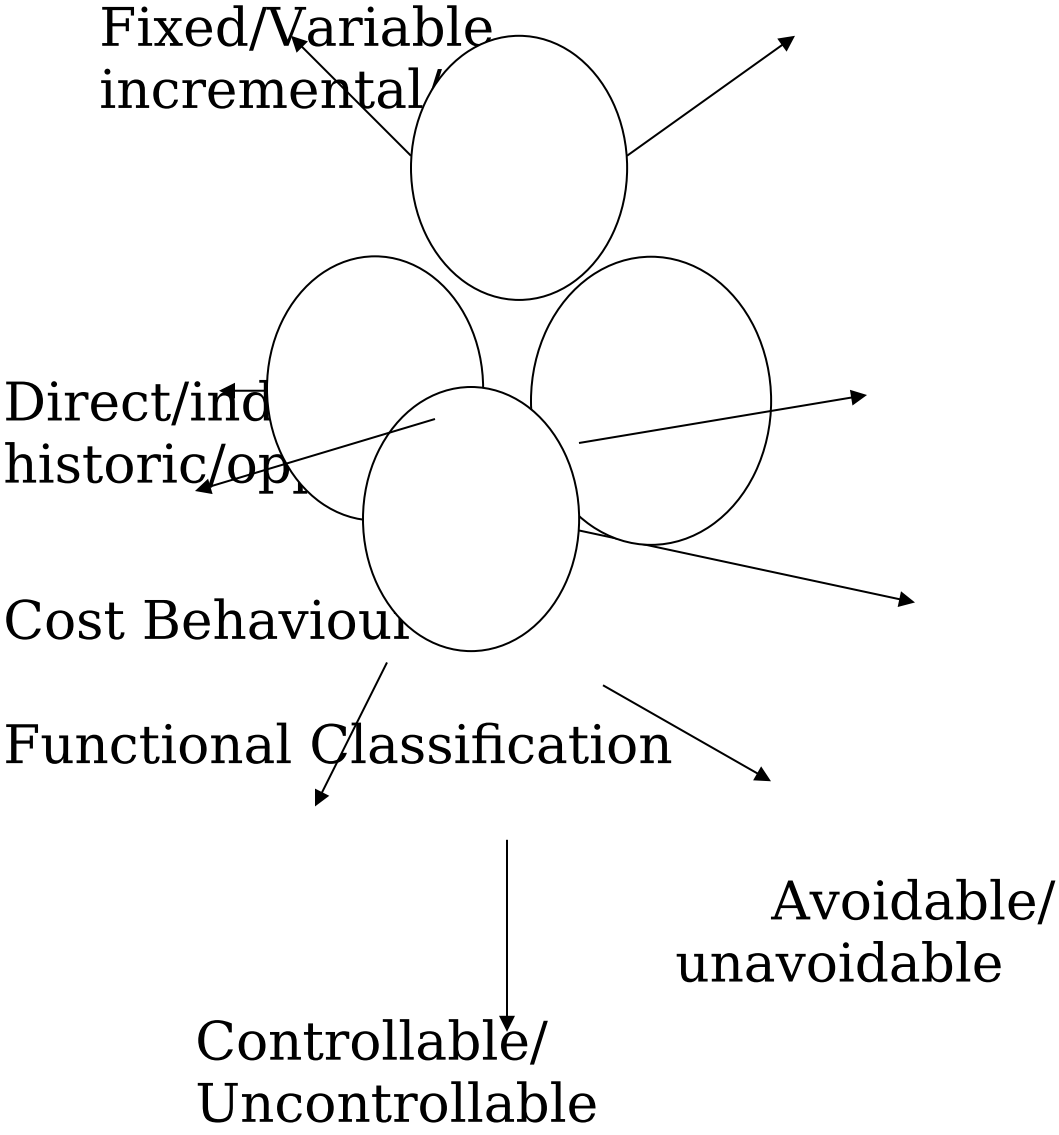
i) Is the cost incurred for manufacturing reasons (production cost) or for manufacturing support reasons (non-manufacturing cost)?

j) How does the cost behave with respect to changes in the output level,

- Does it remain fixed throughout irrespective of the output level (fixed cost),
- Does it change proportionately with the change in output level (variable cost),
- Does it remain fixed when output is zero but increases as output increases from that point onwards (semi-variable); or
- Does the cost remain fixed within certain production bands but change immediately to another fixed level once the output band changes (a stepped cost)?

These different bases of cost classification are summarized in the diagram below:

Manufacturing/ Non-manufacturing



In our course, we will always refer to either of these terminologies every now and then, in different cost

accounting situations. You will also meet them extensively in Management Accounting in the advanced stages of your course, where you will utilize their distinction to make appropriate profit maximizing management decisions as well as budgetary planning and control.

Remember, a cost is simply a quantification or measurement of the economic sacrifice made to achieve a given objective. It is therefore a measurement of the amount of resources sacrificed in attaining a specified goal.

2.2 Importance of cost classification

Analysis of cost behaviour is important to all organizations for effective management. This is because many organizations have a unique cost structure. For example, fixed costs account for 60 – 80% of all

hospital costs. However, unlike many organizations of this type, labour costs largely comprise the hospital's fixed costs.

Labour costs unlike depreciation require a cash outflow. This is characteristic of labour intensive organizations. Capital-intensive organizations, on the other hand, have low labour costs, e.g. computerized manufacturing organizations.

Some organizations e.g. hospitals allocate 10 –15% of their space for standby emergency events giving them built in idle capacity. This prevents them from enjoying advantages of higher profits that a capital-intensive organization realizes at higher volumes beyond the break-even volume. Thus the cost structure of healthcare institutions presents challenges to accountants because of their labour intensive and capital-intensive characteristics

2.3.1 Manufacturing Vs. Non Manufacturing costs:

➢ Elements of Manufacturing costs:

Manufacturing costs are the costs incurred to produce a product. Remember that a product refers to both goods and services.

The elements of manufacturing costs are :

- ➢ Material costs,
- ➢ Labour costs; and
- ➢ Overhead costs.

These elements make up the total cost of a product, as shown below:

Total product cost = Material cost + Labour Cost + overhead cost

These costs are discussed further in the following sections.

a) **Material costs**;

Material refers to all the physical inputs into the production process. They include the following:

- **Raw material** refers to bought in material which is used in the manufacture of the product. According to the organization raw material may further be classified as steel, timber e.t.c.
- **Components and subassemblies** i.e. bought in components and subassemblies which are incorporated in the product
- **Work in progress** i.e. partly completed assemblies and products incorporating raw materials and or subassemblies
- **Consumable materials** i.e. materials used in the operation of the factory and during production but do not appear in the product e.g. detergents
- **Maintenance materials** i.e. materials of all types used in maintaining machinery, buildings and vehicles e.g. spare parts, lubricating oil and grease

- **Office materials**; materials used in operation of the office e.g. stationery

b) Labour costs

What is labour?

Labour costs could be direct or indirect labour costs.

Direct labour cost refers to wages paid to workers who are directly involved in the conversion of raw materials into finished goods. These are called **direct labour costs**

Indirect labour costs__refers to the wages paid to workers whose efforts cannot be readily identified with specific product units or batches e.g. labourers paid to maintain all the premises utilized for production of goods and services.

c) **Overhead costs**:

They are also called indirect production costs. They are those costs which can only be charged to a cost unit using some estimated basis. The

estimating procedure allows a share of the indirect costs to be charged to each cost unit. These costs cannot be identified specifically to the end product.

- **Elements of Non Manufacturing costs**

Non-Manufacturing costs are costs incurred by all activities that support the production of goods and services. They are administration costs, selling costs and distribution costs. These are explained as follows:

a) **Administrative costs**: Is the sum of costs associated with the overall management of the enterprise which cannot be readily identified with one of the major functional areas e.g. salary of the factory manager would be seen as a production cost but the salary of the personnel officer will be viewed as administrative cost since the

personnel function does work for all other functions of the enterprise.

b) **Selling Costs**: Is the sum of costs associated with the securing of orders from customers? Included in this area will be items such as the salaries paid to the salesmen and expenditure on advertising.

c) **Distribution costs**: Is the sum of costs associated with warehousing the products and their delivery to customer? The cost of wooden pallets on which products are stacked for delivery to customers and the cost of delivery whether using the company's own vehicles or outside haulage firm are examples of distribution costs.

d) **Finance Costs:** These are costs incurred to secure funds to finance the organization's activities. These include interests on loans and overdrafts, dividends to shareholders, interests on debentures etc

e) **Research and development Costs:** These are costs that are incurred to invent new products or to modify the existing ones, as well as costs incurred to acquire more information on such products.

2.3.2 Behavioral classification of costs

Definition

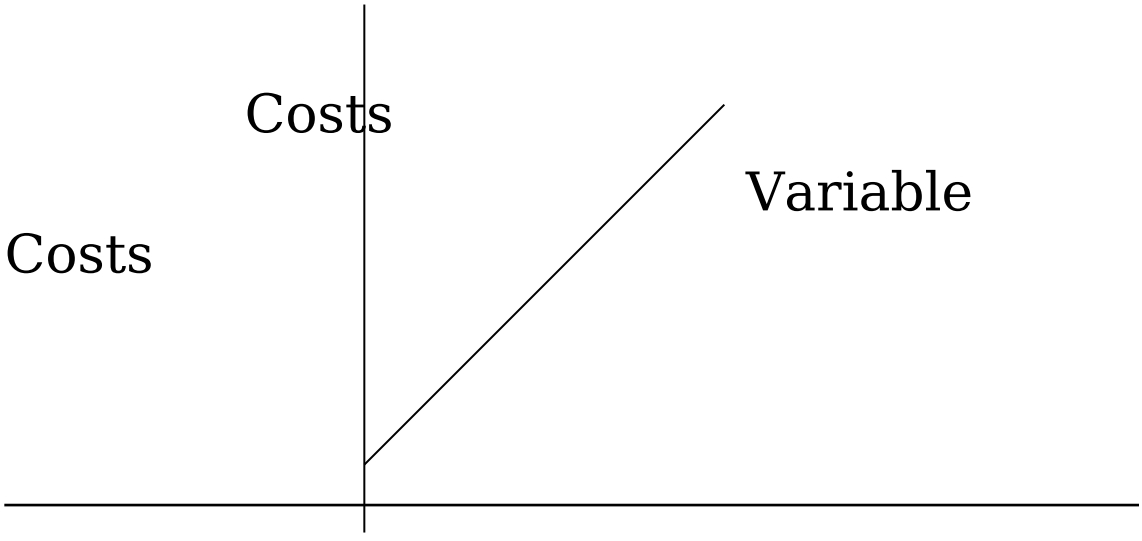
Cost behavior refers to the change in costs (increase or decrease) as the output level changes, i.e. as we increase output, are the costs rising, dropping or remaining the same.

Cost Behaviour can be used to produce various classifications of costs such as:

a) Variable Costs Vs. Fixed Costs

1) Variable costs:

Are costs that increase or decrease proportionately with the level of activity , i.e. that portion of the cost of an activity that changes with the level of output.

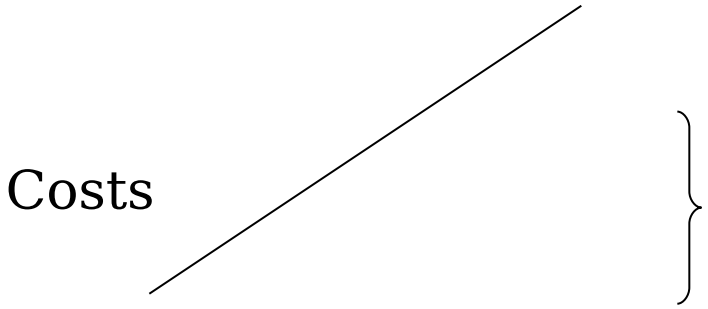




Note that with variable costs, the cost level is zero when production is zero. The cost increases in proportion to the increase in the activity level, thus the variable cost function is represented by a straight line from the origin. The gradient of the function indicates the variable cost per unit.

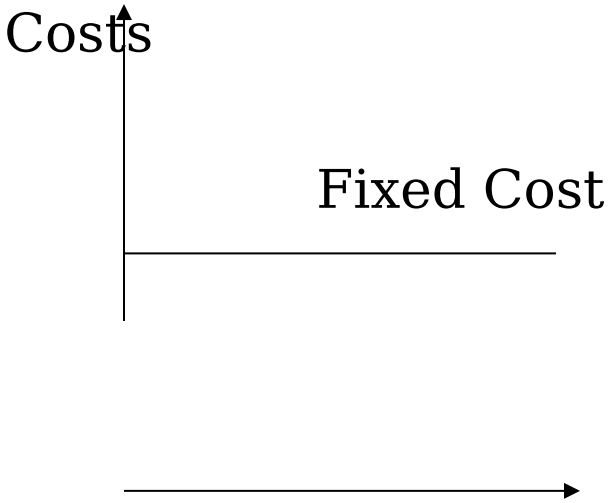
2) Semi variable costs

Are costs with both a fixed and variable cost component. The fixed component is that portion which is constant irrespective of the level of activity. They are variable within certain activity levels but are fixed within other activity levels, as shown below:



3) Fixed Costs

Are costs that do not change with of the level of output. It is also called autonomous cost, as it remains the same irrespective of the activity level as shown below.

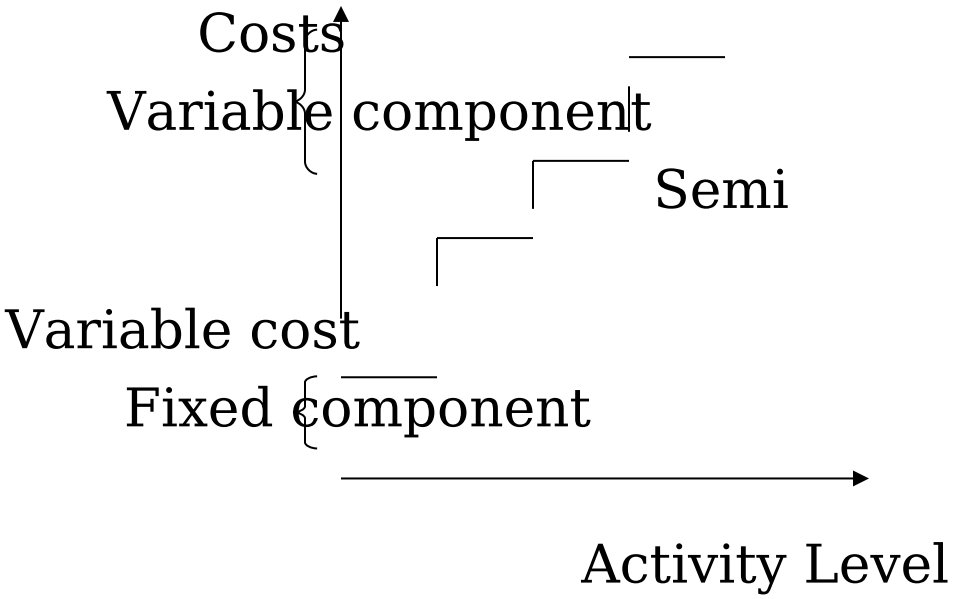


The classification of cost into fixed and variable costs would **only** hold within a relevant range beyond which all costs

are variable. The relevant range is the activity limits within which the cost behaviour can be predicted.

4) Semi Fixed Costs

Are costs with both a fixed and variable cost component. The fixed component is that portion which is constant irrespective of the level of activity. They are variable within certain activity levels but are fixed within other activity levels, as shown below:



b) Direct Vs. Indirect costs

Recall that direct costs are costs that can be traced specifically to the end

product of the production process while indirect costs cannot be so traced.

- **Direct costs** consist of costs that can be directly attributed to a specific output, product or level of activity. Direct costs include direct raw materials and direct labour also called **prime costs in aggregate.**

  PRIME COST = Direct Material Cost + Direct Labour Cost

- **Indirect costs** are costs that will not be directly attributable to a specific product. They are regarded as overheads. Identification of overheads to specific products is done through cost allocation and apportionment. They include supervisors' salaries, rent, electricity, depreciation of building etc.

c) Controllable Vs. Non Controllable costs

Controllable costs can be influenced at the level of authority at which they are being analysed while non-controllable costs cannot.

- **Controllable cost**; Refers to the cost which can be influenced by the actions of a person in whom authority for such control is vested, for example control of labour cost will be influenced by the method of remuneration and the degree at management control which is exercised by a certain managers.
- **Non controllable cost**: is cost which cannot be influenced by a person in whom authority for such control is vested for example if the trade union demands an increase in wages the increment is non controllable cost. Similarly, the depreciation of a building is a non-controllable cost to a

manager as he does not have authority over depreciation!

In decision making, only controllable costs are considered because they can be changed by the decision maker. There is little or nothing that the decision maker can do about the non-controllable costs thus they are irrelevant in decision making. However, the facilities provided by the nun-controllable costs should be efficiently used.

2.3.3 Functional Classification of costs:

Under this classification, costs are classified according to the function they perform in an organization. Costs can functionally be classified as:

a) **Production costs**: Are all the costs incurred in production of units during a time period e.g. raw material

costs, direct labour costs and production overheads.

b) **Administration costs**: These are all costs incurred in ensuring the smooth running of the organization so as to facilitate the production and sale of goods and services. These include: salaries for the managers, salaries for support employees (such as accountants, clerks and secretaries) etc

c) **Selling and distribution costs**: These are costs that are incurred to enable the delivery of products and services to the actual markets and promote or complete a sale. These costs include: salesmen commission, saleswoman salaries, advertising costs, depreciation on motor vehicles used by salesmen, the cost of fuel used by vehicles used for distribution purposes etc.

d) Other functional classifications

2.4 COST ESTIMATION

Introduction:

Cost estimation may be defined as ‘a study which attempts to predict the between costs and the activity level or cost driver that causes those costs. In practice, managers frequently encounter such cost drivers (what is a cost driver?) as machine hours, number of transaction, work cells, labour hours, and units of output e.t.c.

The cost estimating function is

y = a + bx,

Where

Y represents Total cost

a represents cost fixed component of the total cost

bx represents the variable costs component of the total cost

b represents the unit variable cost (this is the gradient of the equation)

x represents output level

This is the usual straight line equation you have been encountering in elementary mathematics.

2.4.1 Purpose of Estimation

It assists in estimating the future expenditure (cost prediction) as the expenditure will depend on the cost of the respective activities

a) It assists in determining the net benefits anticipated in a specific activity based on the relationship between projected costs and projected revenue.

Cost estimation is useful in business planning, cost control, performance evaluation and decision making.

2.4.2 Methods of cost estimation

We will consider following cost estimation methods commonly utilized, namely:

a) High Low Activity method

b) Account Analysis

c) Engineering Analysis

d) Visual Fit (Scatter graph) method

e) Simple linear regression analysis

f) Learning curve Theory

a) High – Low method

Here, cost estimation is based on the relationship between past cost and past level of activity. Variable cost is based on the relationship between costs at the highest level of activity and the lowest level of activity. The difference in cost between high and low activity level is taken to be the total variable cost from which the unit variable cost can be computed by dividing it by the change in output level. This is indicated below:

Total Variable Cost = Cost at high activity level – Cost at low activity level

Therefore,

Unit Variable cost = Variable cost = Cost at high level activity – cost at low level activity

Output Units

Units at high activity level – units at low activity level

The variable cost per unit so calculated forms the ‘b’of the straight line equation mentioned earlier. By substituting ‘ b’ into the equation, we can obtain ‘a’, the fixed cost.

Illustration

Based on performance, you have been provided with the following information regarding ABC Ltd for the year ended 31 December 2004 :

	Labour hours	**Service cost (Shs)**
Highest activity level	800	200,000

Lowest activity level 300
150,000

Required

Develop a total cost function based on the above data using the high-low method.

Solution

Unit Variable cost = Variable cost = Cost at high level activity – cost at low level activity

Output Units

Units at high activity level – units at low activity level

Variable Cost Per Unit = Shs.200,000 – shs.150,000

800 hrs – 300 hrs

= Shs.50,000 = shs.100/hr

500 hrs

Therefore b = 100

To get the fixed cost a, substitute 'b' into the straight line equation as follows:

When labour hours (x) = 800, service cost (total cost, y) = shs.200,000

Therefore from the Straight Line equation, y = a + b x

200,000 = a + (100) 800

200,000 = a + 80,000

a = 200,000 – 80,000

a = 120,000

Therefore fixed costs = shs.120,000

NB: Even if we used the 2nd set of labour hours and service costs, were would still get he same answer i.e.

When labour hours (x) = 300, service cost (total cost, y) = Shs.150,000.

Therefore 150,000 = a + 100(300)

a =150,000 – 30,000 = Shs.120,000

Therefore the cost equation is:

$$y = 120,000 + 100x$$

This equation can be used to estimate or predict the total costs : for example, when the activity level is say at 1000 labour hours, then the total cost would be

$$Y= 120,000 + 1000(100)$$
$$=120,000 + 100,000$$
$$= Shs.220,000.$$

What are the advantages and disadvantages of the high low method?

b) Account Analysis (Inspection of Accounts)

Using account analysis, the accountant examines and classifies each ledger account as variable, fixed or mixed. Mixed accounts are broken down into their variable and fixed components. They base these classifications on experience, inspection of cost behaviour for several past periods or intuitive feelings of the manager.

Example

Management has estimated Shs.1,090 variable costs, Shs.1,430 fixed costs to make 100 units using 500 machine hours. Since machine hours drives variable costs in our example, the variable cost stated as

Then we get the total cost equation as

Y = ,1430 +2.18 x

Where y = total cost

x = number of machine hours

For 550 machine hours

Total cost = Shs.1,430 + Shs. 2.18 (550) = 1,430 + 1,999 = Shs.2,629

This analysis should determine whether any factors apart from output machine hours are influencing total cost.

A danger in using this method lies in the fact that many managers may assume a cost's behaviour without further analysis. This is because the method is highly subjective.

c) Engineering method

This method is based on a detailed study of each operation where careful specification is made for materials, labour and equipment necessary to produce a product. It involves identifying the level of input required of an activity in form of raw material and labour while total cost is based on the cost of each input. This approach is applicable where no past data exists. The main setback of the approach is that it requires a complex analysis of all the constituents of an activity and the requirements of an activity in terms of costs detailed into materials, labour, overheads and time.

d) Visual fit (scatter graph method)

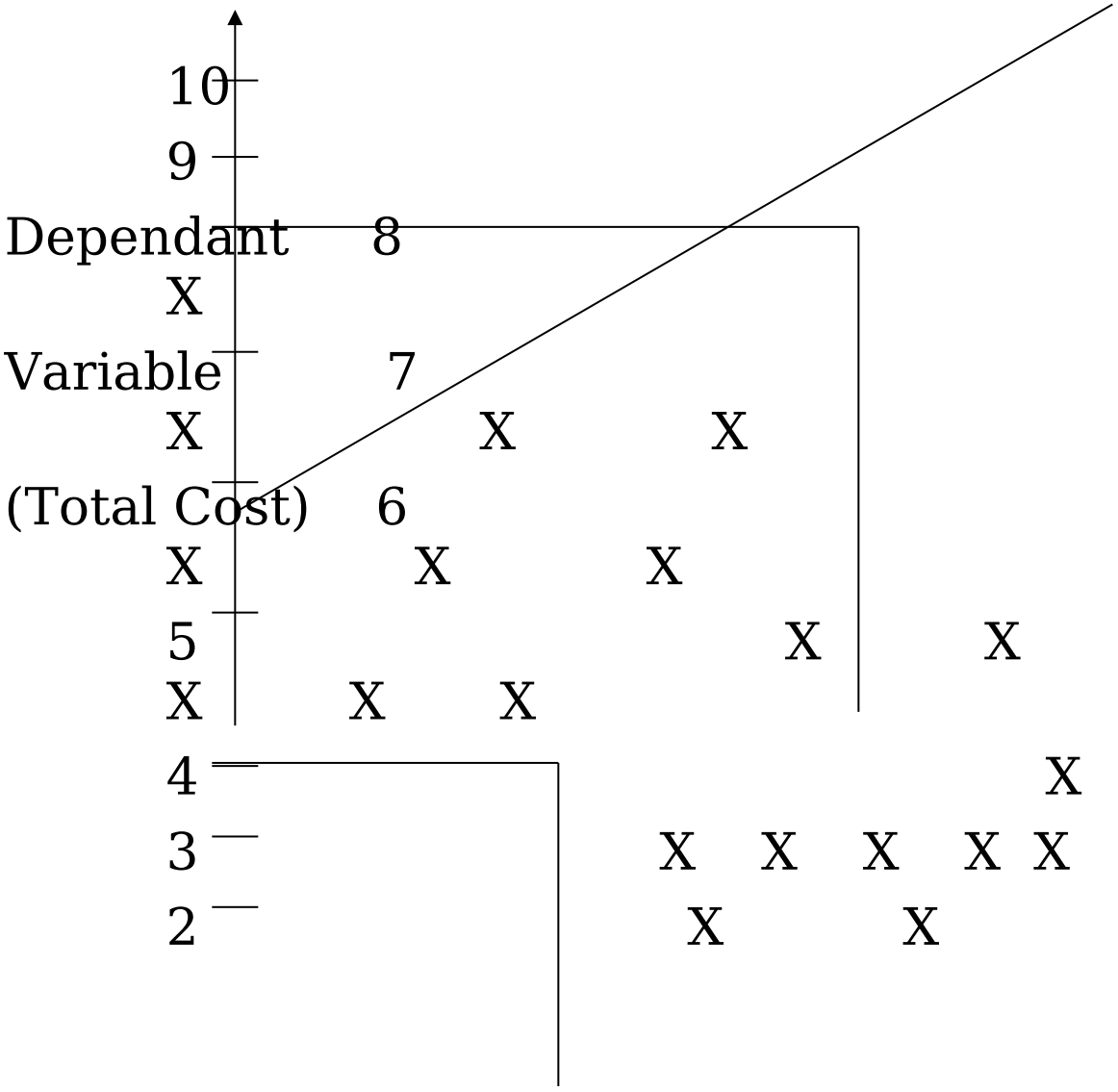
Cost estimation is based on past data regarding the dependent variable and the cost driver. The past data on cost levels and the output levels) is plotted on a graph(called a scatter graph)and a line of best fit is drawn as shown in

the diagram . A line of best fit is a line drawn so as to cover the most points possible on a scatter graph. Its intersection with the vertical axis indicates the fixed cost while the gradient indicates the variable cost per unit.

Illustration:

Assume a firm has total costs of 8m, 4m and 1m respectively when the output units are 400,000, 200,000 and

respectively. Estimate its cost equation using the visual fit method.





Note: Fixed Cost = X_0 = 1m

Gradient = Change in Y / Change in X = $Y_3 - Y_2 / X_3 - X_2$ = Variable Cost Per Unit

Variable cost = Change in cost / Change in activity level = 8m – 4m / 400,000 – 200,000 = 20

Per unit

∴ Total cost equation y = 1m + 20 x

On the basis of the existing data, fixed cost is Shs 1m and the variable cost per unit is 20. On the basis of the developed model, estimates can be made regarding future cost. When the activity level is

600,000 units, total cost will be estimated as:

TC = 1M + 20 (600,000) = 1M + 12M = 13 M

e) Regression analysis

It involves estimating the cost function using past data or the dependent and the independent variables. The cost function is based on the regression of the relevant variables. The cost function will depend on the relationship between the dependant variable and the independent variable. **The dependent variable** will constitute **the relevant** cost which may be service, variable cost, overhead cost e.t.c. The independent variable will be the cost drivers where the cost drivers will be labour hours, units of labour or raw materials, units of output e.t.c.

In regression analysis, a regression model of the form y= a + bx for a simple regression is obtained. For a multiple regression, a regression model

of the form $Y = a + b_1x_1 + b_2x_2 + b_nx_n$ is obtained

Where a is fixed cost, x_1,x_2,x_n are cost drivers x_1,x_2,x_3 upto x_n.

b_1,b_2 b_n are changes in cost with the change in value of cost driver i.e. variable cost per unit of change in x_1,x_2,x_n

y is the dependant variable (Total cost)

Note that a simple regression produces a cost function of the form y = a + bx so that we only have only one variable cost per unit (b) and only one independent variable (cost driver) x..

However, a multiple regression produces a cost function of the form

$y = a + b_1,x_1 + b_2, x_2 + b_n,x_n$ so that we have several variable costs per

unit (b_1,b_2,b_n) and several independent variables (x_1,x_2,x_n)

Test Your Understanding

QUESTION ONE

a) Explain the difference between the following terms

i. Product cost and period cost
ii. Sunk cost and relevant cost
iii. Incremental and sunk costs
iv. Fixed and variable cost
v. Avoidable and unavoidable costs
vi. Controllable and uncontrollable costs
vii. Direct and indirect costs

(14 marks)

b) What is the relevance of cost classification? Is it merely an activity for the

sake of it? Explain
(6 marks)

(20 marks)

QUESTION TWO

Discuss the behavioural classification of costs, explaining all the terms used therein.

(20 marks)

QUESTION THREE

Discuss in detail what constitutes manufacturing costs as production costs, administration costs as well asselling and administration costs. **(20 marks)**

QUESTION FOUR

The functional classification of costs classifies costs as production costs, administration costs as well as selling and administration costs.

Explain what constitutes these costs in detail. **(20 marks)**

QUESTION FIVE

Explain briefly how the following methods are used in cost estimation:

i. Account Analysis
ii. Engineering Analysis
iii. Scatter Graph Method
iv. High Low Method
v. Regression Analysis

(20 marks)

REINFORCING QUESTIONS

QUESTION ONE

The Blank Manufacturing Company Ltd. Consists of four production departments and two service departments. For the month of September the direct departmental expenses were as follows:

Production Departments -	A, Shs.800;	B, Shs.5,600;	C, Shs.800;	D,Shs.400
Service Department-	X, Shs1,800	Y, Shs2,400		

The cost of service departments X and Y are allocated to the other departments on a percentage basis viz:

	A	B	C	D	X	Y
X	30	20	25	15	-	10
Y	20	30	10	25	15	-

Required

Prepare a statement showing the distribution of the service department expenses.

QUESTION TWO

One of your clients, a jobbing engineer, has hither to based his quotation on cost of material and labour plus a percentage to cover overheads and profit. He has now accepted your advice to relate costs to the departments (A, B, and C) through which the work passes and in pursuance of this policy, to charge overhead to Jobs on the basis of departmental direct labour hours. With your assistance he has produced the following data for the coming year:

Expenses		Proposed basis of departmental apportionment
Rent, Rates and Insurance	6,200	Floor area
Indirect Labour	3,900	Direct labour hours
Depreciation	2,200	Plant valuation
Repairs and Maintenance	1,200	Technical estimate viz: A,Shs.540; B, Shs378; C,Shs.282

Consumable stores	900	Direct labour hours
Canteen	2,000	Number of employees
Work Manager's salary	2,600	Allocation viz: A,Shs.700; B, Shs.1,100; C, Shs.800
National Insurance	400	Number of employees
General Administration	6,000	Ratio of quotations based on past experience viz: A, 5/12; B, 4/12, C, 3/12

Your client estimates that Department A will work 6,000 direct labour hours in the year; Department B: 4,000; and Department C: 2,000 hours. Wages rates are Department A: Shs.0.5; Department B: Shs.0.45 and Department C: Shs.0.4. The number of employees in each department is: A: 40; Department B: 25; and Department C: 15.

Departmental floor areas are: Department A 15,000 sq.ft; Department B 18,000 and Department C 17,000 sq.ft. The value of plant and machinery used in each department is: Department A Shs.20,000; Department B Shs.18,000 Department C Shs.6,000.

Required

a) Calculate the hourly overheads rates to be charged for work in each department.

b) Prepare a quotation for a Job to which the following data relates:

Direct material	Shs.774.81
Direct labour:	
Department A	20 hours
Department B	12 hours
Department C	4 hours
Profit 20|% on selling price	

QUESTION THREE

a) Explain four reasons why costs of operations need to be allocated to various users.

(8 marks)

b) Discuss three main methods used to allocate costs to the various users.

(12 marks)

(Total: 20 marks)

QUESTION FOUR

In the context of process costing, define and distinguish between joint products and by-products.

(Total: 20 marks)

QUESTION FIVE

a) Explain four requirements that have to be met for uniform costing to be appropriately applied:

(4 marks)

b) A company produces three joint products, Yi, Y2 and Y3. The data below reflects
average monthly results:

	Y1	Y2	Y3
Monthly output (kg)	40,000	20,000	20,000
Sales Value at split off (shs.)	0	30,000	105,000
Sales Value after Split off	45,000	100,000	155,000
Costs of further processing	20,000	40,000	65,000

The joint costs were Shs.100,000

Required:

Allocate the joint cost using the three methods used to allocate joint costs. (16 marks)

(Total: 20 marks)

CHECK YOUR ANSWERS WITH THOSE GIVEN IN LESSON 9 OF THE STUDY PACK

COMPREHENSIVE ASSIGNMENT NO.1

TO BE SUBMITTED AFTER LESSON 2

To be carried out under examinations and sent to the Distance Learning Administrator for marking by the University.

Time Allowed: 3 Hours
Attempt any FIVE questions

QUESTION ONE

1. From the following, prepare a schedule highlighting;

Prime cost
Production cost
Total cost

		Sh.
(i)	Expenses of the administration function	60,000.00
(ii)	Materials used in producing products	220,000.00
(iii)	Depreciation in	
	Sh.	
	Office equipment 5,000.00	
	Machinery (production) 29,000.00	
	Delivery vans 18,000.00	
	Show rooms 6,000.00	58,000.00
(iv)	Direct labour costs incurred	155,000.00
(v)	Indirect factory expenses	17,000.00
(vi)	Wages of truck driver	30,000

		.00
(vii)	Salaries and expenses of salesmen	100,000.00
(viii)	Salaries of the administration staff	40,000.00
(ix)	Salaries of the production staff	30,000.00
(x)	Expenses of delivering goods	50,000.00

(16 marks)

QUESTION TWO

Papermaking Ltd. Makes paper which is cut and packed before being transferred into the finished goods store. The paper is moved from department to department by a fork lift truck. Each pack of finished product contains one ream of paper. The paper is loaded onto wooden pallets before delivering to customers. The following cost information related to papermaking Ltd. For period ended 31st March 19x4

	Sh.
Pulp	100,000.00
Clay	40,000.00
Wrapping paper (used in packing dept.)	3,500.00
Spare knives for cutting machines	800.00
Cleaning rags for machines	500.00
Royalty payments	10,000.00

Making dept. wages to packages	38,000.00
Cutting dept. wages for machine crew	26,000.00
Packing dept. wages to packages	20,000.00
Fork lift truck driver wages	8,000.00
Factory managers salary	11,000.00
Wooden pallets	3,600.00
Dispatch dept. wages	17,000.00
Delivery vehicle driver wages	9,600.00
Sales managers salary	17,500.00
Advertising cost	16,500.00
Sales office wages	18,500.00
General Managers salary	30,000.00
Production managers salary	21,500.00

Maintenance fitter wages	25,000.00
Maintenance workshop costs	17,000.00
Maintenance engineers salary	18,000.00
Administration salaries	45,000.00
Electricity costs (See note 1)	18,000.00
Administration office machine rental	1,000.00
Sundry other costs;	
Production	33,000.00
Administration	42,000.00
Selling	11,000.00
Distribution	16,000.00

Note 1

Electricity is charged to each function area as follows; production 75%, administration 5%, selling 5%, distribution 15%.

Note 2

Maintenance costs should be totaled before a cost summary is prepared and charges to each function making use of the maintenance service as follows; production 80%, administration 3%, selling 3%, distribution 14%.

Required

Prepare a cost summary for the period ended 31 March 19x4 analyzing costs into
prime costs, production costs and total cost.

(Give all subtotals of classified costs). **(24 marks)**

QUESTION THREE

Lorenzo Company operates a brushless car wash; incoming vehicles are put on an automatic, continuously moving conveyer belt. Cars are washed as the conveyor belt carries the car from the start station to the finish station. After the car moves off the conveyor belt, it is dried manually. Workers then clean and vacuum the inside of the car. Workers are managed by a single supervisor. Lorenzo serviced 80,000 cars in 2000. Lorenzo reports the following costs for 2000:

Account description	**Costs (sh)**
Car wash labour	240,000,000
Soap, cloth and supplies	32,000,000
Water	28,000,0

	00
Power to move conveyor belt	72,000,000
Depreciation	64,000,000
Supervision	30,000,000
Cashier	16,000,000

Required

(a) Classify each account as variable or fixed with respect to cars washed.

(b) Lorenzo expects to wash 90,000 cars in 2001. Use the cost classification you developed in (a) to estimate Lorenzo's total costs in 2001.

(c) Calculate the average cars of washing a car in 2000 and 2001. (Use the expected 90,000 car wash level for 2001)

QUESTION FOUR

The following data has been provided by a catering company that prepares banquets and parties for both individuals and business functions through the year. The data indicates that overhead expenses vary with the direct labour hours expended.

Month	Labour hours	Overhead costs(sh.)
January	2,500	55,000
February	2,700	59,000
March	3,000	60,000
April	4,200	64,000
May	4,500	67,000
June	5,500	71,000
July	6,500	74,000
August	7,500	77,000
September	7,000	75,000
October	4,500	68,000
November	3,100	62,000
December	6,500	73,000

Total	57,500
805,000	

Required

(a) Using regression analysis, calculate the variable cost per person for a cocktail party, if the following additional information is given. The cost structure on a person basis is;

Food and beverages	sh.15.00
Labour (0.5)	5.00

(b) The company has asked you to prepare a bid for a 200 person cocktail party to be given next month. Determine the minimum bid price the company would be willing to submit to earn a profit.

(c) Compute the value of: (i) r and(ii) r squared. Explain the significance of the values giving their names.

QUESTION FIVE

CMB Company has budgeted factory overhead for four volumes of operations as follows:

	Machine hours			
Costs (sh)	5,000	6,000	7,000	8,000
Indirect labour	2,100	2,400	2,700	3,000
Insurance	600	600	600	600
Depreciation	1,000	1,200	1,400	1,600
Utilities	2,000	2,300	2,400	2,900
Total	5,700	6,500	7,100	8,100

Required

(a) Indicate whether each of the four overhead cost budgeted is fixed, variable or semi variable

(b) Using the high low method, determine the cost estimating formula for each of the four factory overhead costs.

END OF COMPREHENSIVE NO.1

NOW SEND YOUR ANSWERS TO THE DISTANCE LEARNING CENTRE FOR MARKING

LESSON THREE

COST ACCUMULATION

OBJECTIVE

By the end of this lesson you should be able to describe the cost accumulation process for materials, labor and overheads and solve computational problems

CONTENT

Cost accumulation

- Define cost accumulation
- Elements of cost: material, labor and overheads
- Determination of costs in manufacturing, services and retail industries

Material costs

- Ascertainment of material costs/classification.
- Material cost records
- Material purchasing procedures

- Receipts, issue and storage of materials
- Methods of valuing material issues.
- Stores control procedures.
- Ledger entries for material costs. (Introduction to cost book keeping)

Labour costs

- Classification labor costs
- Methods of labor remuneration
- Labor control procedures
- Maintenance of labor records
- Wages department
- Ledger entries for labor costs

Overhead costs

- Definition
- Types/Classification
- Purposes of overhead cost analysis
- Allocation and apportionment of overhead costs
- Absorption of production overhead costs
- Absorption of non-production overhead costs by cost units
- Over or under absorption
- Ledger entries for overhead costs

INSTRUCTIONS

Read the assigned study pack text
Reinforcement Questions 3.

3. MATERIAL COSTS

Materials refer to the tangible inputs into the process of producing useful output. They could be direct materials or indirect materials (overheads) e.g. to produce tea, tealeaves is the material (input).

3.1 **Material cost classification**

Material costs may be classified as:

a) **Direct Material Cost:** Refers to costs of materials that may readily be identified with output units. The cost of timber used in the manufacture of a chair is an example of a direct material.

b) **Indirect Material cost:** refers to items of raw materials for which it would be difficult and or inefficient to attempt to charge directly to specific cost units. For example the glue used to bind the joints in the assembly of a chair

Other examples of indirect materials include:

- Materials used by service departments e.g. spare parts used

by maintenance department in repairing and servicing plant and machinery

- Materials used by non production functions e.g. stationary used in accounting department

Material cost control

Materials form a significant cost of output units and therefore should be controlled. Material Control is more than simply recording the accounting transactions relating to material cost. Control should be implemented to ensure that material is available

a) In appropriate quantities
b) In appropriate quality
c) In appropriate location
d) At an appropriate time
e) At the most economic cost

Control may be exercised at a number of points in the business cycle as follows

a) When the choice is made as to the type and quality of material to be used

b) Where the purchase order is being placed with the chosen supplier

c) On receipt of the material from supplier, check the appropriateness of quality and quantity of materials received.

d) Where the material is held in store before use: It must be safe from theft and damage

e) Where the material is issued from the store: It must be issued to the correct department

f) Where the material is being used for intended purposes e.g. the material must be utilized to produce the desired output.

The material control system must attempt to ensure that the company does not incur costs in excess of an agreed efficient level of expenditure. Lack of adequate control routines will result in

the incidence of costs in excess of an acceptable level, reduced profitability of production and increased operational costs.

Inventory Control and Management

The objectives of inventory management are

- To ensure adequate stocks to allow for continuous operations/production, and
- To minimize the cost of having inventory.

Inventory management is important since in most organizations it represents the largest single investment. The major types of inventory are:

- Raw materials
- Work in progress
- Finished goods

To achieve the above objectives of material cost costing , the manger has to make decisions regarding the following:

a) What commodities to stock?

- Use Material Requirement Planning

  From the Master Production Schedule, the manager has determined the products to be produced. A Bill of Materials can then be prepared. This lists in descending order the components required to make the final product. The information required includes part name or description, part number, next higher level assembly, required quality per end item, quantity per end item and quantity required for the next higher level assembly.

  Stores Ledger Account is also used to obtain information on what is currently available. The file shows balance on hand as well as past data on how much is usually ordered, lead-time, and safety stock.

From the above the manager can determine what need to be purchased.

b) How much to stock?

- Use The Economic Order Quantity Model

This is a simple model that helps the manager to determine the optimum quantity of stock to order so as to keep total costs at a minimum. The main costs of inventory are:

- Holding or carrying costs
- Ordering or set up costs
- Shortage costs

To determine the economic order quantity the following formula may be used:

$$EOQ=\frac{\sqrt{2DC_O}}{Ch}$$

Where D is the annual demand (knits)

Co is the cost of making one order

Ch is the holding cost per unit per annum

- **Use Pareto Analysis**

  Items are classified into three classes as follows:

  Class A: These are high cost, fast moving and high usage items. They are few accounting for only 20 percent of the total number of items yet account for 80 percent of the total inventory budget.

  Class B: These are medium moving goods. They account for 15 percent of the total number of the budget

  Class C: These are slow moving low value items. They are very many accounting for 65 percent of the total number of items and only 5 percent of the total inventory budget.

c) When to stock?

This will be influence by the inventory system in place as follows:

- **Periodic order system.**

  The firm receives a new order of the amount specified by the order quantity at equal intervals of time. The firm determines the maximum and minimum inventory, the safety stock and the reorder level.

- **Continuous Review System**

  The firm places orders at regular intervals but the order quantity varies according to how much a firm requires to bring the level to some predetermined size or value.

- **Just In Time Inventory System**

This is a concept developed by the Japanese and advocates zero inventory and stockless production. In addition, it calls for 100 per cent quality. Some of the major features of JIT include:

a) Frequent and reliable deliveries to avoid inventory build up. Companies are also setting delivery

dates with penalties for not meeting them.

b) Closer location to suppliers and customers

c) Improved communication between companies and suppliers through the use of computerized purchasing systems that allows for online ordering.

d) Single sourcing and building long-term relations with a few trusted suppliers.

e) Increased supplier involvement in the design aspects of a product to ensure that they meet the company's quality requirements.

f) Maintenance of strict quality control by all parties.

Material Handling

The objective is to ensure that goods are delivered to the right places at the right time and in aright manner to avoid delays, congestation and unnecessary handling. A big percentage of production

costs is taken up by material handling activities. A good material handling system should minimize these costs.

The manger needs to determine the type of equipment to be used to handle the material. The type of equipment that is most frequently used includes:

- Cranes
- Lifts
- Trucks
- Conveyors
- Towing

The factors that influence the type of equipment used includes:

- Type of materials being moved
- Volume
- Rate or frequency of movement
- Route of movement speed required
- Method of storage employed
- Safety or hazards involved.

Storage and Issue of Material

A number of factors are relevant in control of materials during storage and issue of materials. They are:

a) Stores location and layout

b) Stock level and its control.

c) Stock control records and issue procedures

d) Stock taking procedures

e) Valuation of inventories (issues and closing stock)

Stores location and layout

The layout of stores should ensure

a) Ease of access for movement of material in and out of stores

b) The issue of perishable materials on a first in first out basis

c) The segregation of toxic and dangerous materials in a separate location

d) Security of materials by restriction of access to authorized personnel only

The location of stores should ensure

a) Nearness to point of use to minimize expenditure on handling costs

b) Specialist stores e.g. spare parts for machinery should be located close to the point of use.

Stock Level and its control

Management must make decisions about the control of stock levels with a view to minimizing the cost of the company while achieving more efficiency in the availability of material to fulfill planned usage requirements. Consideration should be given to the following control levels:

a) Minimum stock level

b) Maximum stock level

c) Re-order level

d) Re order quantity (Note the re-order quantity is not necessary the EOQ)

a) Minimum stock level

This is the level below which stock should not fall. It is essentially a base (buffer) stock level. If stock falls below this point, there is a danger of stockout.

Minimum stock level = Reorder level – (Normal consumption x normal reorder period)

b) Maximum stock level

This is the upper limit above which stock should not be allowed to rise. Each material to be kept in store must have a maximum level and stock should not be allowed to go beyond this level

Maximum stock level = Re-order level +re-order Quantity - (Minimum consumption x minimum re-order period)

c) Re-order level

Is a point that lies between minimum and maximum stock levels at which purchase orders must be placed to ensure that goods ordered are received

before the minimum stock level is reached? It is the level of stocks at which replenishment must be made to avoid a stock-out.

Re-order level = maximum consumption X maximum re-order period

d) Re-Order quantity

This is the quantity of stock ordered once the re-order point is reached. The quantity is such as to minimize stock costs taking into consideration the cost of holding stocks and making an order. This is also regarded as the **Economic Order Quantity (EOQ).** It is computed as follows:

Where D is the annual demand (knits)

Co is the cost of making one order

Ch is the holding cost per unit per annum

$$EOQ=\frac{\sqrt{2DCo}}{Ch}$$

Economic Order Quality (EOQ)

Define the EOQ model and the three methods of computing EOQ.

- Assumptions of the model.

Illustration

The following information was extracted from the books of Danex Holdings regarding its stocks:

i.	Reorder quantity	1,800
ii.	Reorder period	4 weeks
iii.	Maximum consumption	450 units/week
iv.	Normal consumption	300 units/week
v.	Minimum consumption	150 units/week
Vi	Maximum reorder period	5 weeks
Vii	Minimum reorder period	3 weeks

Required

Determine the following stock levels for Danex Holdings:

i. Re-order level

ii. Maximum stock level

iii. Minimum stock level

Solution

i) Re-order level = Maximum consumption X maximum reorder period

= 450 units X 5 weeks = 2,250 units

ii) Maximum stock level = reorder level + reorder quantity-

(Minimum consumption X minimum reorder period)

= 2250 + 1800 – (150 X3) = 4050 – 450 = 3600 units

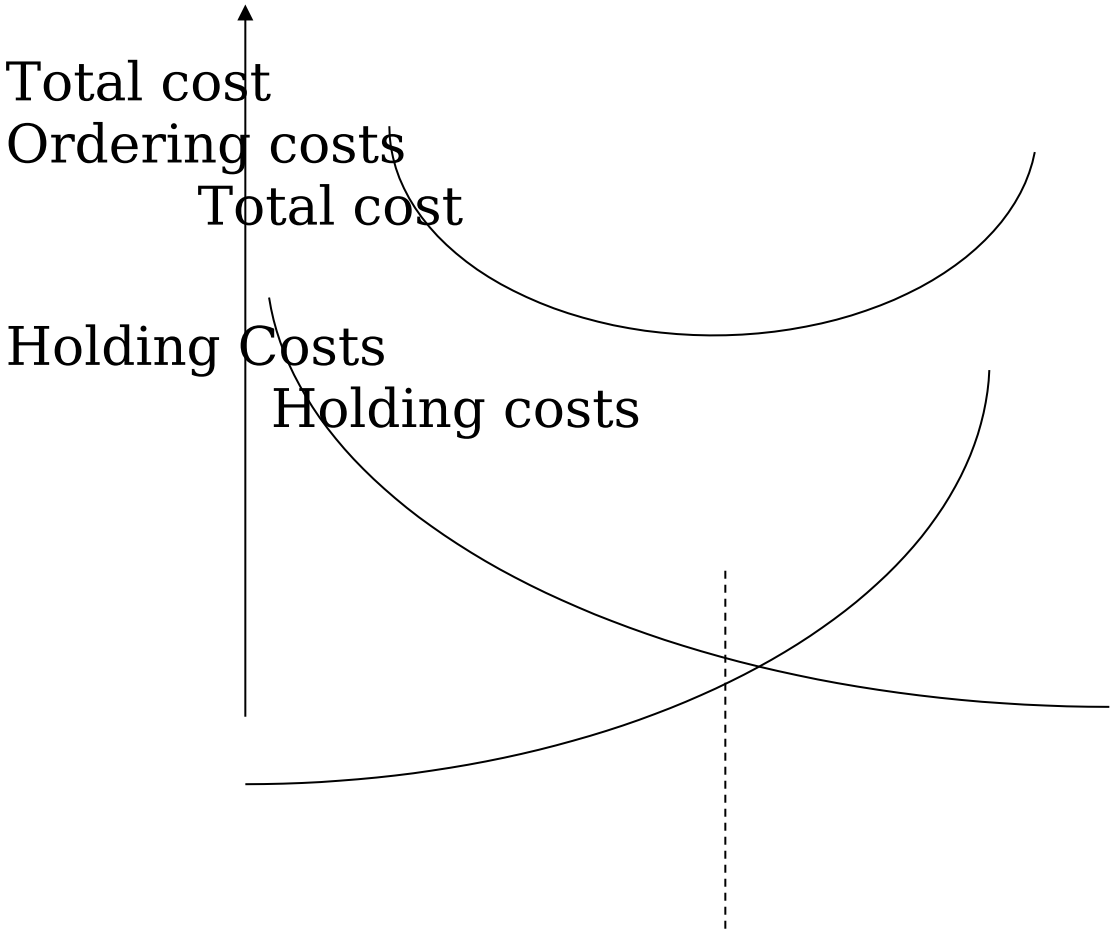
iii) Minimum stock level = Reorder level – (Normal consumption X normal reorder period)

= 2,250 – (300 X 4) = 2250 – 1200 = 1050 units

Economic Order Quantity (EOQ):

It constitutes the quantity purchased of either stocks or raw materials that is considered most optimum. This is the

quantity that minimizes both holding costs and ordering costs, As the quantity of purchase increases there is a reduction in ordering costs, but an increase in holding costs as illustrated in the graph below:





0 Q^x

Quantity of Inventory

Q^x represents the EOQ where the aggregate stock cost is lowest

Total cost = Total ordering costs + Total holding costs

Total ordering costs = cost per order X no of orders in a period

Total holding cost = average stock quantity X holding cost per unit

The EOQ can also be delivered mathematically as explained below:

Mathematical Derivation of EOQ

Let cost per order be represented by C_o. This is the cost incurred every time one order is placed.

Let the economic quantity purchase every time be represented by Q

Let holding cost per unit be represented by Ch

Let total demand be represented by D

The total holding cost = ½ QCh

The total Ordering cost = $\frac{D}{Q}$ C_O: Note that $\frac{D}{Q}$gives you the number of order in the period

Then total cost = ½ Qch + D/Q C_O (or simply the total holding up cost plus the total ordering costs)

EOQ is at the point where holding cost is equal to ordering costs

i.e. ½ Ch = D/Q C_O

∴ ½ Q^2Ch = D C_O $Q^2 = \sqrt{\frac{2DO}{h}}$

Q^2Ch = 2D C_O

$Q^2 = \frac{2DCo}{Ch}$ Therefore Q $\sqrt{\frac{2DCo}{Ch}}$Therefore EOQ=$\sqrt{\frac{2DCo}{Ch}}$

The EOQ model assumes:

- Annual demand is known
- Hold costs are constant and known

- Ordering costs are known and constant
- The same quantity is ordered every time an order is made since demand as assumed not to fluctuate significantly.

Example

ABC Ltd has an aggregate demand of 1.2 Million units. Each time they place an order there is an ordering cost of shs 1,000, holding cost is shs 100 per unit. Determine:

i. EOQ
ii. No. of order to be made based EOQ
iii. Total cost of stocks based on the EOQ

Solution

$$EOQ = \sqrt{\frac{2DCo}{Ch}} = \frac{2X1200000X1000}{100} = 4899 \text{ units}$$

i) No of order $= \frac{1200000}{244.9} = \approx 245$ Orders

4899

ii) Total cost = $\frac{DCo}{Q}$ + ½ QCh = $\frac{1200000}{4899}$(1000) + ½ (4899)100 = 489,900

3.4 Valuation of inventory (Issues and closing stocks)

Valuation of inventory aims at attaching a monetary value in the stores or issued for production. This is useful in producing. State costing the output and pricing production, as well as decision making.

Methods used in valuing inventory:

a) First In First Out

b) Last In Last Out

c) Weighted Average method

3.41 First in First out (FIFO)

This method is based on the assumption that stock purchased first is issued first. Prices of stock purchased first are used to determine the cost or value of

inventory issued. Closing stocks are carried at the latest costs.

Advantages

1. It is a realistic system: oldest items are usually issued first out.
2. Unrealized profits or losses do not arise
3. It is easy to calculate if prices of materials don't fluctuate
4. Closing stocks values reflect the latest costs thus tend to reflect the current market values.
5. It is acceptable to many tax authorities and is also consistent with accounting practices e.g. IAS/IFRS.

Disadvantages

1. It involves tedious calculations if the price of materials fluctuate from time to time
2. Product costs, based on the oldest material prices, lag behind current conditions especially in inflationary markets.

3. Comparison of one job with another may be difficult if materials are issued at different prices.

3.42 Last in first out (LIFO)

Is based on the assumption that the stock purchased last is issued first. Stock valuation should therefore be based on the prices ruling on the acquisition of the last stocks.

Advantages

1. Product costs tend to be based on current market prices and is therefore realistic.
2. A charge to production is as closely related to current price levels as possible

Disadvantages

1. Stocks are valued at the oldest prices.

2. It involves tedious calculations if the price of materials fluctuate from time to time.
3. Comparison of one job with another may be unfair and difficult

3.43 Weighted average method

i. This method is a perpetual weighted average system where the issue price is recalculated after each receipt of stocks taking into account both quantities and money vale of the stocks received.

In this case stock used or unused is based on the average price per unit where the average price per unit is calculated as follows:

$$= \frac{\text{Total value of stocks}}{\text{No. of units of stock}} = \text{Average Price Per Unit}$$

$$= \frac{(\text{Money value of old stocks} + \text{Money Value of New Stocks})}{(\text{Quantity of old stocks} + \text{Quantity of New Stocks})}$$

Illustration

Assume the following purchases were made in ABC Ltd

Date of purchase	Units purchased	Price/unit
1st January	500	100
2nd January	600	200
3rd January	800	400

Units used on 4th January are 900. Determine the value/cost of units used by using FIFO, LIFO and weighted average.

Required:

Determine the cost of units used and the value of the closing stocks using FIFO, LIFO and Weighted Average.

Solution

1. FIFO

	Cost of units used		
Date	Units	Unit price	Total cost
Jan 1	500	100	50,000
Jan 2	400	200	80,000
	900	Cost of units used	130,000

Closing stock is valued as

Jan 2	200	units x 200 shillings	=	40,000
Jan 3	800	units x 400 shillings	=	320,000
	1,000			360,000

2. LIFO

Cost of units used

Date	Units	Unit price	Total cost
Jan 3	800	400	320,000
Jan 2	100	200	20,000
	900	Cost of units used	340,000

Closing stock is valued as

Date	Units	Unit price	Total cost
Jan 2	500	200	100,000
Jan 1	500	100	50,000
	1,000	Value of closing stocks	150,000

3. Weighted average

Date	Units	Unit price	Total Cost of Issues

0 – 0 900 257.8 232,105.20

Closing Stock Valuation = (Goods Available – Goods Issued) x Unit Price =

Unit Price = $\frac{50(100)+60(200)+80(400)}{1,900}=\frac{490,000}{1,900}=257.8$

Other methods include

- **Standard cost**
- **Replacement cost**
- **Next in first out**

4. LABOUR COSTS

4.1 DEFINITION

Labour costs refers to all the costs incurred in compensating the human resources employed to provide a useful service in the production process. This compensation usually comes in the form of:

- Basic salary
- Wages
- Overtime pay
- Bonus
- Allowances

4.2 CLASSIFICATION OF LABOUR COSTS

It can be classified into

a) Direct or indirect cost

b) Fixed or variable cost

c) Controllable and non controllable cost

a) **Direct labour cost** may be defined as the cost of remuneration for employees efforts and skills applied directly to a product or saleable service and which can be identified separately in product costs.

Indirect labour cost may be defined as labour costs, which are not charged directly to a product.

The analysis of labour costs into direct or indirect cost depends upon the circumstances under review

Examples include-

The wage paid to a worker who assembles components for a product is a direct cost while that paid to a worker who is moving components for a range of products from one part of the factory to another is an indirect cost.

b) **Fixed cost** in relation to labour is where by an employee is paid a fixed weekly wage irrespective of the output produced cost varies directly with level of activity, for example

where wages are paid at a rater per unit.

c) **Variable Labour Cost**_varies directly with level of activity, for example where wages are paid per unit.

d) **Controllable labour cost** is a cost, which can be influenced by the actions of a person in whom authority for such control is vested. The control of labour costs will be influenced by the method of remuneration and the degree of management control, which is exercised.

Uncontrollable labour costs cannot be influenced by an officer in the organization, for example, wage rise agitated by the trade union is an uncontrollable labour cost.

4.3 Time Keeping

A labour cost control routine should ensure that payments are paid only to employees who have spent time at the work place and that payments are at agreed rates of pay including overtime

premium and shift premium payments where relevant.

Where an employee is paid a fixed sum for an agreed length of working week, it may be decided by a check by the supervisor that the employee is at work is all that is necessary.

Where the employee is being paid at the rate per hour for the time spent at work together with premium rates for overtime work, it is likely that a detailed record of time spent on the premises is required. This is done by having the employee to register his arrival and departure times.

4.3.1 Time analysis

This is usually achieved by having the employee complete a daily or weekly timesheet or by having job cards or piecework tickets. Where time sheets are issued, the employee records the time analysis stating how much time was spent on each job and recording idle time. This sheet will then be authorized by the supervisor. Job cards move with a job as it passes from one employee to

another. There may be time clocks at each work center where the time spent on the job is recorded. Where this routine is used, employees may also be required to clock idle time on an idle time card, which will be analyzed to determine the cause of idle time. Where payments are made in return for out put units, piecework tickets may be completed which are signed by the supervisor certifying the number of units claimed. The analysis of employee time will facilitate:

a) Correct charge of direct labour cost to each job

b) Correct charge of indirect labour cost to cost centers

c) Control of labour costs by job and cost center

d) Calculation of employee bonus

e) Measurement of efficiency

4.4 Methods of Labour Remuneration

Labour remuneration methods can be broadly classified into two:

i. Time rate (on the basis of the time spent in the factory)
ii. Piece Rate (On the basis of work done)

Most of the remuneration methods are a combination of or modification of these 2 systems

4.4.1Time Rate System

May be a flat time rate or a high day rate.

Under flat time rate, each worker is paid for the time spent without considering the volume of production during that period

This may be paid daily, hourly or monthly basis as follows:

Total Pay = Hours worked X rater per hour

Under the **high day rate system** the workers time rate is fixed at a higher level than the usual rate of payment if the output exceeds the expected (usually set) level. The objective of this system is to provide an incentive to the workers while retaining the simplicity of the

system. It is most appropriate for easily measurable output to which groups of workers contribute e.g. car assembly lines.

4.4.2 Piece Rate System

An employee is paid a fixed amount for each unit produced irrespective of time taken; the wages payable are calculated as follows:

Wages = Number of units produced X Rate per unit

In this case, there is a flat rate per unit. However, a company may modify this and apply the Taylor's **differential price rate system** where three piece rates are set for each job: the low, normal higher piece rate. The low piece rate is applicable where a worker is not able to achieve the standard (normal) output and the highest piece rate is for those above standard. If it does not guarantee minimum wages on time basis, this may lead to high wage differential in the company and consequently demotivation. For this reason, the differential price rate system as well as many variations of the

piece rate system contain a **minimum (guaranteed) pay.**

Premium Bonus Schemes

Illustration 1

Under a premium bonus scheme, workers received a guaranteed basic hourly minimum rate of pay plus a bonus of 50% of the time saved. No payment is paid beyond the time allowed but the bonus which is paid at the basic hourly rate is applicable to the accepted output only. No penalty is imposed on rejected output. The following details are available for the month of January 2003

Worker	**A**	**B**	**C**
Time allowed per unit (hrs)	¼	1/6	½
Units produced	474	684	175
Units rejected	54	84	25
Time taken (hrs)	78	72	80
Basic Pay per hour (Kshs)	6	6	3

Required

From the above information calculate for each employee

a) Bonus hours and amount of bonus paid

b) Gross wages earned

c) Labour cost for each good unit sold

Solution

4.3.1 Worker A

Total time saved = Expected time – Time taken

= ¼ (474 – 54) – 78 = 1/4/ X 420 – 78

= 105 – 78 = 27 hours

Accepted time saved = 50/100 x 27 = 13.5 hrs

Therefore bonus hours = 13.5 hours

Bonus pay = 13.5 x 6 = Shs 81

Worker B

= 1/8 (684 – 84) = Shs 100

Time saved = 100 – 72 = 28 hours

Bonus hours = 28/100 X 50 = 14 hours

Bonus pay = 14 x 6 = Shs 84

Worker C

= ½ (175 – 25) = 150/2 = 75 hours

Time saved = 75 – 80 = - 5

Bonus hours = 0

4.3.1 Gross Wages = Regular wage by Bonus

	A	B	C
Time allowed per unit	¼	1/6	½
Regular pay	78 x 6 = 468	72 x 6 = 432	75 x 3 = 225
Bonus pay	81	84 / 5 = 16	0

549

4.4.3 Good units

	A	B	C
Good units	474 – 54 = 420	684 – 84 = 600	175 – 25 = 150
Labour cost per unit of output	549 / 420 = 1.30	516 / 600 =0.86	225 / 150 =1.5

Illustration 2

Based on the data below you are required to calculate the remuneration of each employee as determined by each of the following methods

i. Hourly rate
ii. Basic piece rate
iii. Individual bonus scheme where the employee receives the bonus in proportion of the time saved to time allowed

Name of employee	Salmon	Roala	Pike
Units produced	270	200	220
Time allowed in minutes per unit	10	15	12
Time taken (hours)	40	38	36
Rate per hour (Kshs)	125	105	120
Rater per unit (Kshs)	20	25	24

Solution

	Salmon	Roala	Pike
i. Hourly rate	40 x 125	38 x 105	16 x 120
	= 5000	= 3990	= 4320
ii. Piece rate	Salmon	Roala	Pike
Gross wage	270 x 20	200 x 25	220 x 24
Therefore	=	= 5,000	= 5,280

regular wage	5,400

iii. Bonus scheme	Salmon	Roala	Pike
Time saved			
Time allowed	(270x100) /60 = 45 hours	(200x15)/ 60 = 50 hours	(220 x12)/60 = 44 hours
Time taken	40 hours 5 hours	37 hours 12 hours	36 hours 8 hours

Bonus time = $\frac{\text{Time taken}}{\text{Time allowed}}$ x total time saved

	Salmon	Roala	Pike
	$\frac{40}{45}$ x 5 = 4.4	$\frac{38}{50}$ x 12 = 9.12	$\frac{36}{44}$ x 8 = 6.55
► Bonus	4.4x12	9.12x10	6.55x120

Pay	5 = 550	5 = 958	= 786
► Total pay			
= Gross pay + Bonus	5,000 + 550	3990 +958	4320 + 786
Using hourly rate	= 5550	= 5958	= 6066

4.4.4 Group Bonus Plan

There are certain jobs or operations which require to be done collectively by a group of workers, for example, continuous production work flows in a sequence or in assembly work of computers, radio, televisions e.t.c A team of workers is engaged in various operations and as such it becomes necessary to introduce bonus schemes for collective efficiency of the group as a whole and the intention is to create a collective interest in the work. In this case, the bonus is shared among the members. The proportionate share may

depend on a number of factors, for example, the level of employee in management structure, the department in which the employee falls, his current salary e.t.c.

Benefits associated with group bonus schemes include

i. It encourages cooperation and teamwork among workers

ii. It reduces absenteeism since an absent worker is found to reduce the group earnings and the group may dislike him

iii. The approach reduces supervision time and cost, thus it is administratively much simpler.

iv. It greatly reduces the number of rates to be negotiated.

v. It may encourage flexible working arrangements within the group.

But it suffers the following setbacks

(i) It may not provide a strong incentive to the individual workers, as it is group based.

(ii) Less hardworking group members are similarly

rewarded as the very hardworking ones: this may cause demotivation in the group.

(iii) It is hard to determine each group members' fair, have of the bonus.

4.4.5 Co-ownership incentive scheme (Profit Sharing Schemes)

The organization allows for ownership whereby the employees are allowed to own a percentage of the shares in the firm and therefore, have in the company's profits. This converts employees from mere salary seekers to individuals who are part of the organization. They will be directly affected by the decisions taken in the firm in form of changes in earnings per share and dividends per share. The company may offer financial assistance in form of security, guarantees or loan if possible

4.5 THE WAGES DEPARTMENT

It is responsible for the preparation of the payroll and the payment of wages. The routine will require:

a) Analysis of clock cards and check of overtime authorization

b) Calculation of bonus

c) Compilation of gross earning

d) Calculations of deductions

e) Preparation of pay details for each employee showing net wages

f) Arranging for payment of wages to employees

4.5.1 Calculation of deductions

A range of deductions are made from gross earnings when calculating the net payment due to the employee such deductions may be statutory, obligatory or voluntary in nature

- Statutory deductions are pay as you earn (PAYE) tax, pensions, and employees, national insurance

contributions. The employer calculates the amount due to be deducted using the relevant rates in force and then arranges to make a total payment in respect of all employees to the revenue authority.

- Obligatory deductions are most likely to comprise payments to an approved pension fund. e.g. National Social Security Fund (NSSF). Once again it is likely that the employer will make a contribution in addition to the employee
- Voluntary deductions include items such as trade union subscription, charity deductions and contributions to saving schemes.

5.0 Accounting for Labour costs

We will have an overview of accounting for labour costs.

a) Gross Earnings

This is shown as item, A which appears as a credit in the wages account and as a debit in the wages analysis control. The gross earnings are analyzed to show the various deductions leaving net pay and also direct and indirect wages are charged to a range of account codes

b) PAYE tax

Is show as item C which is credited to a PAYE tax account before being paid to the Kenya revenue Authority by the employer. Item X shows the payments from the bank account (credit) and the clearing of the PAYE tax account (Debit)

c) National Hospital Insurance Fund (NHIF) Deductions

The employee's national insurance deduction is credited to a national insurance account (Item D). In addition the employer makes a national insurance contribution for each employee. This is shown as item F, which is debited to an expense account and credited to the

national insurance account. The total insurance (D+F) is then paid to the national Inland Revenue. Item Y shows the entries, which clear the national insurance account (Debit) and record bank payment (Credit). The employer's national insurance is a business overhead expense.

d) Other deductions

Includes such items as pension contributions and trade union subscriptions. The initial deductions from employees are credited in deductions account (Item E) before payment is made to the appropriate fund.

e) Net pay

This is shown as item B which is the balancing figure in the wages account (debit) and when payment is made, it is shown in the bank account (credit)

f) Direct Wages

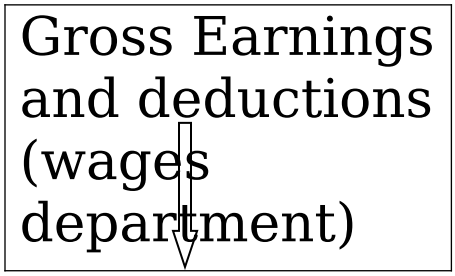
Item T shows the credit to wages analysis control and the debit to

job/product accounts. Individual accounts would be kept for each job or product in addition to overall control account.

g) Indirect Wages

It is a simple analysis transaction which is debited to overhead expense account or departmental accounts

Figure 4.0 Accounting for Labour cost



(a)The financial Accounting Approach

Wages Account	
Net pay (B) Paye (C) NI D (D) Other deductions (E)	Gross earning (A)

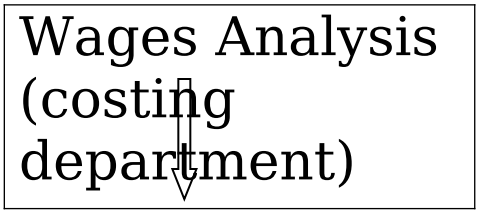
PAYE Tax Account	
Bank X	Wages Account (C)

National Insurance	Account
Bank Y	(D) Employees NI (F) Employees NI

Other deductions	Account
Bank Z	(E) Wages Account

Employees NI	Expense Account
(F) NI Account	

(b)The Cost Accounting Approach:



Wages Analysis	Control Account
Gross Earning A	Direct wages J Indirect wages K

Job production	Account
Direct wages J	
Overhead Expense	Department Account
Indirect wages K	

Cash/ Bank	Account
	Net payment B PAYE X NI Y Other deduction Z

5.0 OVERHEAD COSTS

5.1 Introduction

Overhead costs may be defined as the total cost of indirect materials, indirect labour and indirect expenses. They may occur or be charged to:

a) Production cost centers i.e. making, finishing and packing departments.

b) Service costs centers for example maintenance and power generation

c) Other non production cost centers for example administration, selling and distribution

In this section, we will look at how these overhead costs are changed to production and non-production departments so as to determine the total cost incurred by every department in the organization.

5.2 Overhead cost classification and analysis

Overhead costs may be analyzed into

a) That which may be directly identifiable with a single cost center, for example, wages paid to indirect workers who work solely in one cost center such as making department.

b) That which is incurred as a single figure and is then shared amongst cost centers which make use of it, for example, the rates payable to the local authority

c) The total cost of a service department, for example, maintenance department will have various costs charged to it for material, labor and other expenses.

ses of overhead cost analysis

There are a number of situations in which the analysis of overhead costs will assist in the satisfactory

evaluation of the relevant cost data. These include:

a) The control of overhead expenditures

There must be a link between overhead cost and the manager responsible for its control. This is best achieved by having the planned level of overhead costs for each cost center compared to the actual cost incurred in order that any differences may be investigated and corrective measures taken.

b) Charging of overheads to cost units

As products pass from one cost center to another in the production cycle, direct costs for material and labour are charged to them. In addition, each product or job should share a part of indirect costs of the business. This may be done by assessing the benefits extracted from each cost center through which the product or job passes and then choosing a suitable absorption basis

c) Valuation of work in progress

At any point in time, there may be partly completed goods in the production cycle. Such work in progress must be valued at the end of an accounting period in order that profit be calculated and a balance sheet arrived at. This may be achieved by the absorption of production overheads in each cost center.

d) Valuation of abnormal losses

This is a similar procedure to that for **work in progress**. Such losses also need to be charged to the departments that incur them for efficiency analysis purposes.

e) Profit measurement

The valuation of work in progress and finished goods stock will affect the profit reported. The basis on which production overhead has been absorbed by cost units will therefore have a direct influence on the level of profit reported during the period.

f) Decision making

It is vital that **relevant costs** are used in any decision making situation. Production overhead costs may be allocated to a department (cost center) or apportioned to it using some arbitrary apportionment basis. In addition overhead cost may be a fixed or variable behaviour pattern as activity changes. The total costs associated with cost centre and the organization as a whole affect the

kind of decisions made by the management. But such relevant costs need to be **incremental (**making a difference) and **future__costs** (not sunk costs) that are **controllable** (not uncontrollable) by management.

Absorption Costing

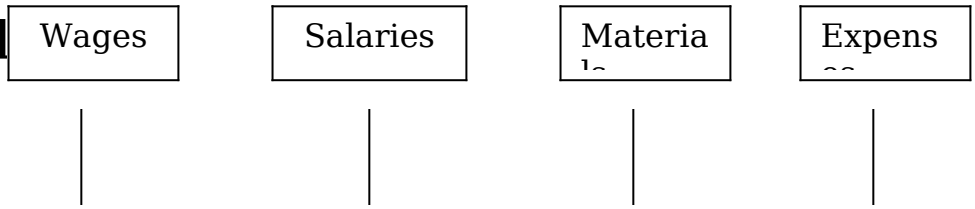
The process described in this lesson by which total overheads are absorbed into production naturally enough is known as absorption costing. The absorption of total overheads into product costs has implications for performance measurement, cost control and stock valuation and students should be aware that the process described is subject to criticism by some managers and accountants.

The criticism arises from the fact that overheads contain items, known as fixed costs – which do not change when the activity level changes and which would still have to be paid if there was no activity, e.g. rates – and items, known as variable costs, which vary more or less

directly with activity, e.g. power consumption. To overcome some of the difficulties, an alternative method of costing has been developed, known as marginal costing, which, although using the process of absorption, excludes fixed costs from the absorption process.

COST ELEMENTS

Stage 1



Two w

Codin

Coding by cost department of type of expenditure and location of expenditure

Stage 2

Cost Analysis

- Allocation
- Apportionment

Service Cost

Overhe ad

e.t.c.

Stage 3

Service Cost Centres

Stage 4

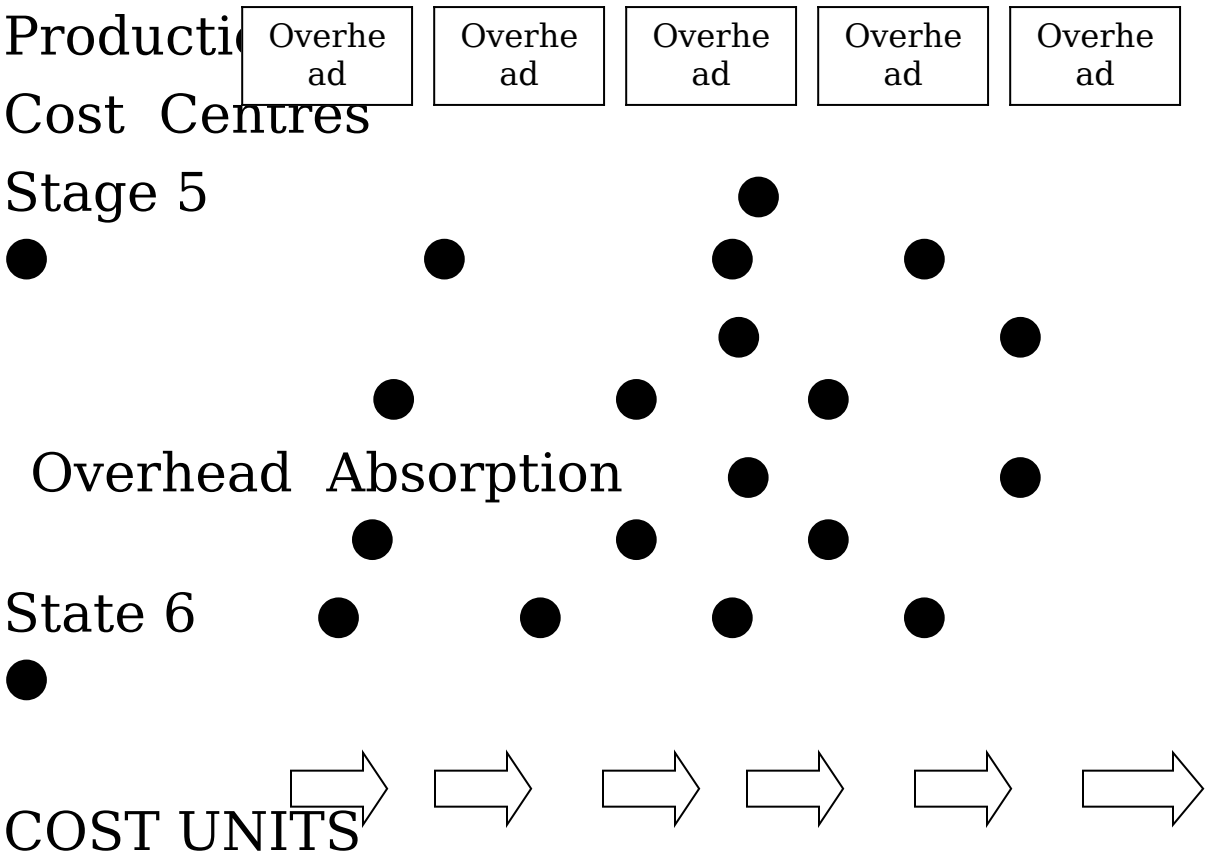

Overhead
Overhead
Overhead
Overhead
Overhead
Production Cost Centres
Stage 5
Overhead Absorption
State 6
COST UNITS

Figure 9.1

Stage 1. Cost Elements

The raw data relating to Labour, Materials, Expenses are gathered from Invoices, Payroll, Goods Issued Notes and Requisitions.

Stage 2. Coding

All the raw cost data needs to be classified and then coded in respect of the type of expense and location. This process is fundamental to all costing and management accounting procedures.

Stage 3. Cost Analysis

Where discrete items of cost can be allotted to cost centers this is termed allocation. Where the cost has to be spread or shared over several cost centers this is known as apportionment.

Stage 4. Service Cost Centres

These are cost centers which provide a service to production cost

centers. Examples are Maintenance, Sores and Boiler House. Their costs are built up by the usual process of allocation and primary apportionment and then their total costs are apportioned (secondary apportionment) over the production cost centers, thus forming part of production overheads which are absorbed into the cost units produced. The problems of service cost centers are dealt with in more detail below.

Stage 5. Production Cost Centres

These are the cost centers involved directly in the production process. Typical examples are, the Assembly shop, Drilling machines, Centre lathes, Spray Shop.

Stage 6 Overhead Absorption

The overheads of each production cost centre are absorbed into the costs of the units produced, usually in proportion to the time involved, i.e. by the Labour Hour or Machine Hour Rate.

Service Cost Centres

Because no production cost units pass through the service cost centers, it is necessary to apportion the service department costs, to the production cost centers so that all production costs (including those for the servicing departments) are absorbed into production. Typical basis for secondary apportionment, i.e. the apportionment of service costs to production departments are given below:

Service Department	Possible basis of Apportionment to Production Cost Centres
Maintenance	Maintenance Labour

	Hours
	Maintenance Wages
	Plant value
Stores	Number of Requisitions
	Weight of Materials issued
Inspection	Number of production employees per cost centre
	Number of Inspection Tickets
	Number of Jobs
Production Control	No of Production Employees per cost centre
	No of jobs
Power General Generation	Metered Usage

	Notional Capacity Technical Estimate
Personnel Department	No of Employees per Department

Notes

The basis chosen should be one that is judged to be the most equitable way of sharing the service department ‘s costs

over the departments which use the service. This may mean that a particular and unique basis of apportionment may have to be derived. It must reflect the use made of the services provided.

Wherever possible, service department costs should be charged directly, i.e. allocated. An example

of this would be maintenance wages and materials. When a maintenance job is done for a department, the wages and materials used would be charged directly to the department concerned. In this way only unallocated service department costs need to be apportioned.

n, and Apportionment of Overhead Costs

Allocation of overheads is the term used where the overhead cost item can be charged to a **specific** cost center without the need for any estimation procedure. For example,

a) The salary of the sales manager will be allocated to the selling overhead cost center,

b) The salary of the engineer in charge of power generation will be charged to power generating cost center.

Apportionment of overheads occurs where the total value of an overhead item is shared between two or more cost centers that use the overheads. It is important that an apportionment basis which reflects the benefit extracted by a cost center is used. For example, the rates payable to the local authority may be apportioned on the basis of area of occupancy of each cost center

Re-apportionment of overheads occurs when service department costs are charged to user departments. For example, the maintenance department overhead costs are summarized and then charged to the user department, which will probably include other service or non-production departments.

Service departments do not participate directly in the manufacturing process but play a supportive indirect role. Products do not pass through the

support departments. It is for this reason that service department costs have to be reapportioned to the production cost centers or departments.

The re-apportionment of service department costs may be implemented in a number of ways.

The Two extremes are

a) Where costs of each service department are only charged to production centers administration; selling and distribution centers are not charged with the cost of the service departments are they are they not production centres. This is referred to as the **Direct Method**

Where the reciprocal nature of service costs is fully recognized; that is service departments serve each other. This approach may be implemented using two methods.

i. The repeated distribution method

ii. Using an algebraic approach

b) A compromise method (elimination method) may be used where by the costs of each service cost centers are re-apportioned in turn. The costs of the first service center will be reapportioned to all user centers including other service centers. The first service center however, is then eliminated from any further reapportionment. The cost of the second service center including any costs already reapportioned from the first service center are then reapportioned to all user centers other than the first service center. The process is continued until all service centers are eliminated

Illustration 1

The following information is available in respect of overhead costs by Getwell Ltd

	Making	Finishing	Packing	Maintenance	Power	Admin.	Selling	Distribution

	Shs	Shs	Shs	Shs	Shs	Shs	Shs	Shs
Allocated Overheads	1500	1000	2400	4800	3300	1000	1200	1600
Indirect materials								
Indirect labour	10000	1200	900	14000	4400	2000	800	5600
Other expenses	15000	8000	3000	1500	12400	24000	6600	4000
Depreciation	8000	800	1200	2000	4800	1500	2300	1800
Unallocated overheads		18000						
Rates								
Net vending machine cost		2300						

Heat and light		4000						
Other statistics								
Occupancy sq. m	600	400	500	50	100	200	50	100
Number of employees	20	40	50	20	10	60	15	5
Power estimate (Kwh)	1500	2500	2500	2000		1500	500	1000
Maintenance (hours)	2000	200	400		1000	250	400	750

Required

Calculate the final distribution of overheads to cost centers including the reapportionment of maintenance and power generation service costs to user cost centers where

a) The reciprocal nature of maintenance and power generation center is ignored.

b) The **elimination method** is used whereby the costs of each service center are apportioned in turn between users but once they have been apportioned they are eliminated from any subsequent apportionment

c) The **repeated distribution method** is used taking into account the reciprocal nature of the service costs

d) An **algebraic approach** is used as an alternative to the repeated distribution method

Solution

a) The Direct Method Ignoring reciprocal service charges

Overhead cost allocation and apportionment statement

Basis of Allocation	Making	Finishing	Packing	Maint	Power	Admin.	Selling	Distribution	Total

	on		g						
		Shs	Shs	Shs	Shs	Shs	Shs	Shs.	Shs.
Overhead item	Direct	1500	1000	2400	4800	3300	1000	1200	1600	1680
Indirect materials										
Indirect labour	Direct	10000	1200	900	14000	4400	2000	800	5600	3890
Other expenses	Direct	15000	8000	3000	1500	1240	2400	6600	4000	7450
Depreci	Direct	8000	80	1200	2000	4800	1500	2300	1800	2240

ation			0						0
Rates	Direct	5400	3600	4500	450	900	1800	450	900	1800	0
Vending machine	Employee	200	400	500	200	100	600	150	150	2300
Heat and light	Area	1200	800	1000	100	200	400	100	200	4000
Subtotal		4130	1580	1350	2305	2610	3130	1160	1425	1769
			0	0	0	0	0	0	0	00
Service reapportionment										
Mainten		115	115	2	(23		1	23	43	

ance	25	2	30 05	05 0)		44 1	05	02	
Power	17622	2837	2837		(2610 0)	1702	567	1135	
Total Costs	69847	19789	18642	0	0	34443	14472	19707	1769 00

b) Using elimination method:

This procedure is exactly the same as for the above method except for the reapportionment of the maintenance and power generation costs. The illustration is therefore commenced on the subtotal point where the initial allocation and apportionment has been implemented

The final apportionment will appear as follows

Overhead item	Making Shs	Finishing Shs	Packing Shs	Maint Shs	Power Shs	Admin. Shs	Selling Shs	Distribt.	Total
Subtotal	41300	15800	13500	23050	26100	31300	11600	14250	176900
Service reapportionment	9220	922	1844	(23050)	4610	1152	1844	3458	
Maintenance									
Power	20028	3338	3338		(30710)	2003	668	1335	
Total	70054	20068	18	0	0	34	14	19	176
						4511	1104	69	

	8	60	2		5	2	3 00

c) Recognizing fully the reciprocal nature of service costs (repeated distribution method)

This method differs from the elimination method in that it continues to reapportion a share of a service cost center to other service centers instead of eliminating a center once its costs have been reapportioned in the first instance. The cycle is repeated until the numbers become so small that no further reapportionments are required

The repeated distribution summary will appear as follows:

Overhead item	Making	Finishing	Packing	Maint.	Power
Maintenance hrs (%)	40	4	8		20
Power kwh (%)	60	10	10	8	
Subtotal Kshs	4130	15800	1350	2005	2610

	0		0	0	0	
Service reapportionment						
1st distrib. Maintenance	9220	922	1844	(23050)	4610	115
1st distribution power	18426	3071	3071	2457	(30710)	184
2nd distrib.maintenance	983	98	197	(2457)	491	12
2nd distribution power	295	49	49	39	(491)	12
3rd distrib. Maintenance	15	2	3	(39)	8	
3rd distrib. Power	5	1	1		(8)	
Total distrib maintenance	10218	1022	2044		5109	127
Total distribution power	18726	3121	3121	2496		187
Total overhead	7024	19943	?	0	0	344

charge to user 4
department

d) Algebraic approach

This method requires that the reciprocal nature of the service costs is expressed in a set of simultaneous equations which are solved by matrix algebra

Let x = Total cost of the maintenance cost center

Let y = Total cost of the power generating cost center

Then x = 23050 + 0.20Y

Y = 26100 + 0.20x

The equation shows that

Maintenance cost = initial allocated and apportioned costs of Shs.23050 plus 8%

of the total cost of the power generating center

Power generating cost = initial allocated and apportioned costs of Shs. 26100 plus 20% of the total cost of maintenance center

In a matrix equation it is

$$\begin{pmatrix} 1 & -0.08 \\ -0.2 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 24050 \\ 26100 \end{pmatrix}$$

Simplifying the matrix gives

$$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 25546 \\ 31209 \end{pmatrix}$$

Hence x = Total maintenance cost center cost is Kshs 25,546

y= Total power generating cost center cost is Kshs 31,209

The percentage distribution of the service in the repeated distribution calculation summary shown above are

then applied to the total cost figures x and y

For example for the making cost center

Maintenance cost to making cost center = Kshs 25546 x 40% = Shs. 10,218

Power to cost to making cost center = Kshs 31209 x 60% = Shs. 18,726

Note

You can also use the simultaneous equation solving method to arrive at exactly the same answers above (Shs.25,546 and shs.31,209). Probably, this is more popular than the matrix.

5.2.4 Absorption of production overhead costs

What is overhead absorption?

Absorption of overheads refers to the sharing out of overhead costs to the various cost centers that used the overheads. It is used when the

overheads cannot be allocated or attributed to a specified cost centre.

The aim is to establish the overhead cost per unit of output having allocated and or apportioned overhead costs. The next stage should be to absorb them into the cost of production.

What are the bases of overhead absorption and what factors are considered in their selection?

The first stage in absorption is to establish the absorption rate

What is an overhead absorption rate and what types are there?

NB: Overheads incurred are normally absorbed on the basis of estimated or budgeted figures. The following basis may be applied leading to the following types of rates.

i. Percentage of direct material cost

$$= \frac{\text{overhead cost}}{\text{Direct material cost}} \times 100$$

ii. Percentage of direct labour cost = $\frac{\text{overhead cost}}{\text{Direct labour cost}} \times 100$

iii. Direct prime cost = $\frac{\text{overhead cost}}{\text{Prime cost}} \times 100$

iv. Labour hours = $\frac{\text{overhead cost}}{\text{Labour hours}}$

V . Units of output = $\frac{\text{overhead cost}}{\text{Units of output}}$

Illustration 2

The budgeted production overheads and other budgeted data of calculata Ltd are as follows:

Budget

Overhead cost for the period = Kshs 36,000 **Production department**

Direct material cost
Kshs 32000
Direct labour cost
Kshs 40000

Machine hours
Kshs 10000

Direct hours of labour
Kshs 18000

Units of output
Kshs 10000

Required

Determine the absorption rate of the overheads

Solution

Total overhead costs to be absorbed = Kshs 36000

Absorption rate Calculation

a) Direct material cost $\frac{36000}{32000} \times 100 = 112.50\%$

b) Direct labour $\frac{36000}{40000} \times 100 = 90\%$

c) Machine hours shs $\frac{36000}{10000 \text{ hrs}}$ = Shs 3.6/machine hour

d) Labour direct hours shs $\frac{36000}{18000 \text{ hrs}}$ = Shs 2/direct hour

e) Units of output $\frac{36000}{10000 \text{ units}}$ = Shs 3.6/unit

f) Prime cost = Direct labour + direct material cost

= 32000 + 40000

= Shs 72000

∴ Overhead absorption rate based on prime cost = $\frac{36000}{72000} \times 100 = 50\%$

The overhead cost will vary according to the absorption base. Assume that in the company an individual production has a material cost of Shs 80, labour cost of shs 85, requires 36 labour hours and 23 machine hours to complete. Determine

i. Overhead per individual production on the above different bases

ii. Individual production cost

Solution

a) Production overhead per each absorption rate

Direct Material cost $\frac{112.5}{100}$ x 80 = Shs 90

Direct labour cost $\frac{90}{100}$ x 80 = Shs 72

Prime cost $\frac{50}{100}$ x (80+ 85)= Shs 82.50

Machine hours 23 x 36 = Shs 82.80

Labour hours 36 x 2 = Shs 72

b) Production cost per each absorption base = Prime cost + Overhead cost

Prime cost	+	Overhead cost	=	Product cost

Direct material cost	165	+	90.00	= 225.00
Direct labour cost	165	+	72.00	= 237.00
Prime cost	165	+	82.50	= 247.50
Machine hours	165	+	82.80	= 247.80
Labour hours	165	+	72.00	= 237.00

Illustration 3

The following is the budget of Superb Engineering Works for the year 2002

Factory overheads	Kshs 62,000
Direct labour cost	Kshs 98,000
Direct labour hours	155,000
Machine hours	50,000

Actual labour hours were	40,000
Actual machine hours were	30,000
Actual direct labour costs were	Kshs 50,000
Actual direct material costs were	Kshs 45,000

Required

a) Determine the overhead application rate on the basis of

i. Direct labour hours

ii. Direct labour cost

iii. Machine hours, and

iv. Overhead costs

v. Production cost

Solution

i. Direct labour hours method

Overhead application rate (OAR) = $\frac{62,000}{15,500}$ = Shs.0.4/labour hour

ii. Direct labour cost method

$$OAR = \frac{62,000}{98,000} x100 = 63.27\%$$

iii. Machine hour method

$$OAR = \frac{62,000}{50,000} x100 = Shs.1.24/machine\ hour$$

b) Overhead costs using

i. Direct labour hours = 0.4 x 40000 = Shs 16000

ii. Direct labour cost = 63.27% x 50000 = Shs 31630

iii. Machine hours = 30,000 x 1.24 = Shs 37200

c) Production cost using each of the methods

	Prime cost	Overheads	Total cost	∴Cost/ unit
i. Direct labour hours	95,000	16,000	111,000	111.00
ii.	95,00	31,630	126,6	126.63

Direct labour cost	0		30	
iii. Machine hours	95,000	37,200	132,200	132.20

5.2.5 Over and under absorption of production overhead costs

This may be analysed under

a) Activity

Level of the business or cost center. Expenditure on some items of production overhead costs will vary directly with activity whereas others will be fixed irrespective of the changes in activity level. For example in a machine orientated cost center, power cost will vary in proportion to machine hours whereas salary of the cost center manager will be fixed.

b) Level of expenditure on production overhead

Expenditure level may change from the budgeted level because of a

change in the price of an overhead item or a change in the usage of the overhead item

c) Activity level and the absorption of production overhead cost

In the table below the variable overhead absorbed per machine hour is constant (Shs.3) irrespective of the activity level. The fixed overhead cost per machine hour depends on the activity level used as the base. If 100 machine hours are used, Shs.5 per machine hour must be charged in order to absorb the fixed overhead cost of Shs.500. if 300 machine hours are used, Shs.1.67 per machine hour is a sufficient charge in order to absorb the total fixed overhead cost.

Figure 5.0 Machining cost center

Activity level Machine hrs	Total fixed Overhead costs	Total variable Overhead costs	Total overhead cost	Average Machine	Overhead Hour	Cost per
Shs.	Shs.	Shs.	Shs.	Shs.	Shs.	Shs.
100	500	300	800	5.00	3.00	8.00
150	500	450	950	3.33	3.00	6.33
200	500	600	1100	2.50	3.00	5.50
250	500	750	1250	2.00	3.00	5.00
300	500	900	1400	1.67	3.00	4.67

Production overheads will be absorbed by jobs or products at the pre-determined rater per machine hour.

If the actual number of machine hours used differs from the number used in the calculation of the overhead absorption rate, an over or under absorption will occur.

Note that this problem does not occur with variable overheads since the incidence of the cost (such as power cost) varies with changes in activity.

Illustration 4

Using data from figure 5.0 assume that the production overhead absorption rate was calculated where an activity of 200 machine hours was estimated. Prepare a summary showing any over or under absorption of overhead cost where the actual machine hours charged to jobs turns out to be

a) 150 hours

b) 250 hours

Solution

Absorption rate is Shs. 5.50 per machine hour. This may be analysed into fixed rate Shs.2.50 per machine hour and variable rate; Shs. 3 per machine hour.

a) Where actual activity is 150 hours

	Fixed	Variable	Total
	Shs.	Shs.	Shs.
Overhead incurred	500	450	950
Variable overhead absorbed (150 x 3)		(450)	
Fixed overhead absorbed (150 x 2.50)	(375)		
Total Overhead absorbed (150 x 5.50)			(825)
Under absorption	125	NIL	125

of overhead

b) Where actual activity is 250 hours

	Fixed Shs.	Variable Shs.	Total Shs.
Overhead incurred	500	750	1250
Variable overhead absorbed (250 x 3)		(750)	
Fixed overhead absorbed (250 x 2.50)	(625)		
Total Overhead absorbed (250 x 5.50)			(1375)
Under absorption of overhead	125	NIL	125

c) Expenditure level and the absorption of production overhead cost

A charge in expenditure on an overhead cost item may occur because of a charge in the price per unit and/or because of change in the number of units of the overhead commodity which are required

Expenditure changes can affect the absorption of both fixed and variable overheads

Illustration 5

AB Ltd has a machine cost center for which the following information is available

a) Budget

i. Budgeted (expected) activity
3000 machine hours

ii. Variable production overhead cost per machine hour Shs. 2

iii. Fixed production overhead cost (total) Shs. 9000

b) Actual

i. Activity level 3000 machine hours

ii. Variable production overhead cost incurred Shs. 6400

iii. Fixed production overhead cost incurred Shs. 8800

Required

1. Calculate the over and under absorption of variable overhead and fixed overhead cost

2. Comment on possible causes of over or under absorption figures

Solution

Variable overhead cost

Actual cost incurred Shs.6400
- Overhead absorbed 3000 hrs x Shs. 2
Shs.6000

Shs. 400

Under absorption may have occurred through a combination of

a) Increased price per unit of variable cost e.g. a rise in price or electricity

b) An increase in the number of units of overhead cost item, e.g. machine efficiency has fallen through lack of maintenance

Fixed overhead cost:

Actual cost incurred Shs. 8800
- Overhead absorbed 3000 hrs x Shs. 3
Shs. 9000

Over absorption of overhead cost Shs. 200

The fixed overhead absorption rate 9000/3000 machine hours = Shs. 3 per machine hour.

The actual activity level of 3000 machine hours is the same as that budgeted. The over absorption of fixed overhead is therefore due to expenditure factors. It may have occurred because of the combination of

a) A lower price of a fixed item e.g. salary may be lower than budgeted

b) A reduced usage of what was classified as a fixed cost item e.g. the quantity of oil used to lubricate the machines.

5.2.6 Absorption of non production overheads in production cost

Product costs may be compiled for a range of purposes including

a) Stock valuation

b) Product pricing

c) Decision making

For stock valuation purposes International Accounting Standard No. 2 define cost being that expenditure which has been incurred in the normal course of business in bringing the product or service to its present location and condition. This expenditure should include in addition to the cost of purchase such costs of conversion as are appropriate to that location and condition.

Costs of conversion include production overheads and other overheads attributable in the particular circumstances of the business in bringing the product or service to its present location and condition

For product pricing purposes, administration, selling and distribution overheads may be absorbed in a number of ways including

a) As a percentage of selling price

b) As a percentage of full cost of production

c) As a percentage of conversion costs

d) As a rate per unit sold

For decision making purposes it is also relevant to know which part of administration selling and distribution overhead costs are directly attributable to a particular product and which are avoidable if that product is discontinued.

5.2.7 Activity Based Costing (ABC)

Absorption Costing appears to be relatively straightforward way of adding overhead costs to units of production using, more often than not, a volume-related absorption basis (Such as direct labour hours or direct machine hours). The assumption that all overheads are related primarily to production volume is implied in this system. Absorption costing was developed at a time when most organizations produced only a narrow range of products and when overhead costs were only a very small fraction of total costs, direct labour and

direct material costs accounting for the largest proportion of the costs. Errors made in adding overheads to products were therefore not too significant.

Nowadays, however, with the advent of **advanced manufacturing technology**, overheads are likely to be far more important and in fact direct labour may account for as little as 5% of a product's cost. Moreover, there has been an increase in the costs of **non-volume related support activities**, such as setting-up, production scheduling, inspection and data processing, which assist the efficient manufacture of a wide range of products. These overheads are not, in general affected by changes in production volume. They tend to vary in the long term according to the range and complexity of products manufactured rather than the volume of output.

Because traditional absorption costing methods tend to allocate too great a proportion of overheads to high-volume

products (which cause relatively little diversity), and too small a proportion of overheads to low-volume products (which cause greater diversity and therefore use more support services), alternative methods of costing have been developed. **Activity-based costing (ABC**) is one such development.

The major ideas behind activity-based costing are as follows:

- *Activities cause costs;* activities include ordering, materials handling, machining, assembly, production scheduling and dispatching,
- *Products create demand for the activities*
- Costs are assigned to products on the basis of *a product's consumption of the activities.*

Absorption rates under ABC should therefore be more closely linked tot eh cause of overhead costs and hence product costs should therefore be more

realistic especially where support overheads are high.

Outline of an ABC System

An ABC costing system operates as follows:

Step 1

Identify an organisation's major activities.

Step 2

Identify the factors which determine the size of the costs of an activity/cause of the costs of an activity. These are known as cost drivers. Look at the following examples:

Activity	Possible cost driver
Ordering	Number of orders
Materials handling	Number of production runs
Production scheduling	Number of production runs

Dispatching	Number of dispatches

For those costs that vary with production levels in the shorn term, ABC uses volume-related cost drivers such as labour or machine hours. The cost of oil used a lubricant on the machines would therefore be added to products on the basis of the number of machine hours since oil would have to be used for each hour the machine ran.

Step 3

Collect the costs of each activity into what are known as cost pools (equivalent to cost centres under more traditional costing methods).

Step 4

Charge support overheads to products on the basis of their usage of the activity. A product's usage of an activity is measured by the number of the activity's cost driver it generates.

Suppose, for example, that the cost pool for the ordering activity totaled Ksh.100,000 and that there were 10,000 orders (the cost driver). Each product would therefore be charged with Ksh.10 for each order it required. A batch requiring five orders would therefore be charged with Ksh.50 as its share of the ordering costs for the period.
Absorption costing and ABC are similar in many respects. In both systems, direct costs go straight to the product and overheads are allocated to production cost centres/cost pools. The difference lies in the manner in which overheads are absorbed into products.

Absorption costing most commonly uses *two absorption bases* (labour hours

and /or machine hours) to charge overheads to products

ABC uses *many cost drivers* as absorption bases (number of orders, number of dispatches and so on).

This refers to the distribution or assignment of a group of costs to cost centers. Such costs are assimilated in a similar and should be allocated on the same base. Allocation base is the measure of activity used to allocate a cost pool to the cost centers.

Reasons for Cost Allocation

- To facilitate comparison with externally provided services: It assists in assessing whether to continue the service or contact outsiders.
- To provide ideas on the efficiency of service departments: It helps to determine whether a service department is operating efficiently and its size is optimal.

- To discourage unnecessary service by some managers as they know they'll be charged.
- To provide opportunity for cost price-quality trade offs: Cost allocation helps to eliminate friction between departments. This is because a user department that demands higher quality knows that it will have to bear higher costs.

Allocation of Service Department Costs to Production departments

Service departments are those departments which provide support to production departments but do not engage directly in the production of the products e.g. the accounting department, maintenance department, and the legal department. Service departments provide services to each other and at the same time to the production department. The methods of allocating service costs include:

1. Direct Allocation Method
2. Step-wise Method

3. Reciprocal Method

Direct Method

The service costs are only allocated to the production department according to the usage of the services provided.

Step-wise Method

Some of the costs of the reciprocal services will be recognized although only to some extent. The steps followed include:

Choose one of the service departments and allocate its costs to all the other departments including the other service departments. Normally the basis of choosing that service department to start with is the service department that provides services to the greatest number of other departments.

Another service department is chosen and its total costs allocated the remaining departments excluding the first service departments.

Repeat the process until all the service department costs have been allocated to the production departments.

Reciprocal Method

This method fully considers all reciprocal services. It is the most precise in technically finished method. This method employ, the following techniques:

i. Simultaneous Equation
ii. Matrix Algebra

Illustrations

Assume the following data:

User department	Unit of Service Provided			Costs Prior to Service Department Shs.
	S1	S2	S3	
S1	0	2,000	4,500	92,400
S2	1,000	0	0	184,800
S3	2,000	4,000	0	138,600
P1	4,000	10,000	1,500	400,000
P2	3,000	4,000	9,000	500,000
Totals	**10,000**	**20,000**	**15,000**	**1,315,800**

00

Direct Method

	S1	S2	S3	P1	P2	TOTAL
Cost Prior to Allocation	92,000	184,800	138,600	400,000	500,000	
Allocate S1(4:3)	(92,400)	-	-	52,800	39,600	
Allocate S2 (5:2)	-	(184,800)	-	132,000	52,800	
Allocate S3(1:6)	-	-	(138,600)	19,800	118,800	
	-	**-**	**-**	**604,600**	**711.200**	
						1,315,800

Step-wise Method

	S1	S2	S3	P1	P2	TOTAL
Cost Prior to Allocation	92,000	184,800	138,600	400,000	500,000	
Allocate S1(1:2:4:3)	92,400	9,240	18,480	36,960	27,720	
		194,040	157,080	436,960	527,720	
Allocate S2(2:5:3)		(194,040)	43,120	107,800	43,120	
		-	200,200	544,760	570,840	
Allocate S3(1:6)			(200,200)	28,600	171,600	
			-	573,360	742,440	

1,315,800

Reciprocal Method

Let Sa represent the total costs of service dept 1
Let Sb represent the total costs of service dept 2
Let Sc represent the total costs of service dept 3

Sa = 92,400 + 0.15b + 0.3 Sc----------Eq(i)
Sb = 184,800 + 0.1 Sa ----------Eq(ii)
Sc = 138,600 + 0.2 Sa + 0.2 Sb----------Eq(iii)

Substituting Equation (iii) into Equation (i) and solving, we get;
Sa = 92,400 + 0.1 (184,800 + 0.1 Sa) + 0.35c
Sa = 92,400 + 18,480 + 0.01 Sa + 0.3Sc
0.99 Sa = 110,880 + 0.3Sc----------Eq(iv)

Substituting Equation (ii) into Equation (iii) and solving, we get,

Sc = 138,600 + 0.2Sa + 0.2 (184,800 + 0.1Sa)

Sc = 138,600 + 0.2Sa + 0.22Sc----------Eq(v)

Substituting (v) into Eq(iv) and solving we get,

0.99Sa = 110,880 + 0.3 (175,560 + 0.22Sa),

0.99Sa = 163,548 + 0.066 Sa

0.924Sa = 163,548

Sa = $\frac{163,548}{0.924}$ = 177,000

Therefore Sb = 184,800 + 0.1 (Sa) = 184,800 + 0.1(177,000) = Shs.202,500

Sc = 138,600 + 0.2(177,000) + 0.2(202,500) = Shs.214,500

	S1	S2	S3	P1	P2
Costs before allocation	92,400	184,800	138,600	400,000	500,000
Costs after recognition	177,000	202,500	214,500		
Allocate	(177		35,4	70,	53,

costs	,000	17,7	00	800	100
S1(1:2:4:3)	)	00			
Allocate S2		(202	40,5	101	40,
(2:4:10:4)	20,2	,500	00	,25	500
	50	)		0	
AllocateS3	__	-___	(214	21,	128
(3:1:6)	64,3		,500	450	,70
	50		)		0
	-___	-___	-___	593	722
				,50	,30
				0	0

REINFORCING QUESTIONS

QUESTION ONE

Given: Total budgeted overheads = Shs.240,000

Production budget is as follows:

Product		A	B
i)	Units	20,000	10,000
ii)	Labour hours	20,000	20,000
iii)	Labour cost	Shs.17,500	Shs.22,500
iv)	Machine hours	45,000	15,000
v)	Material cost	Shs.15,000	Shs.25,000

Required

The overhead absorption rater per unit of A and B using the following methods:

a) Unit method

b) Percentage on material cost.

c) Percentage on labour cost.

d) Percentage On prime cost.

e) Labour hour rate.

f) Machine hour rate.

(Total:20 Marks)

QUESTION TWO

A Factory issues a job employee A to produce 35 articles; it takes two standard hours to produce each article. Another job is given to employee B to produce 60 articles; it takes one and half standard hours to produce each article. For every hour saved, a bonus is paid at 50% of the base, which is Sh.200 per hour. The factory works a 40-hour week and overtime is paid at a rate of one and a third. At the end of the week, A's articles and B's clock cards show 49 and 46 hours respectively and the work is complete. However, three of A's articles and three B's articles failed to pass inspection. This was due to defective material and in view of this all the articles produced were paid for, although as scrap they have no seleable value.

Required

For both A and B:

a) Bonus due
(8 marks)

b) Total gross wages due
(8 marks)

c) Wages cost per unit of articles passing inspection (4 marks)

(Total: 20 marks)

QUESTION THREE

ABC Company manufactures leather produces with various end uses. The company applies factory overheads to individual jobs on the basis of machine hours for department A, and on the basis of direct labour cost for department B. The following budget estimates were made by the company at the star of year 2:

	Departm ent A	**Departm ent B**

	Shs	Shs
Direct material cost	800,000	600,000
Direct labour cost	600,000	500,000
Factory overheads	600,000	400,000
Direct labour hours	40,000	50,000
Machine hours	120,000	7,500

Cost records kept by the company showed that Job No.T506 consumed the following inputs during the year:

	Department A	Department B
	Shs	Shs
Materials issued	5,000	Shs.15,000
Direct labour cost	4,800	Shs.4,000
Direct labour	400	500

hours

Machine hours 1,500 100

Required:

a) Determine the overhead application rate for both department A and B.

b) Calculate the total cost of Job No.T506.

c) Suppose the job consists of 50 items, what would be the cost per unit?

d) At the end of the year 2, total factory overheads incurred amounted to shs.975,000. A total of 110,000 machine hours were worked in department A while the total labour cost for department B was Shs.540,000.

Required

Calculate the over- or under- applied for the company as a whole and indicate whether it is
favourable or unfavourable.

(Total20 Marks)

QUESTION FOUR

a) Equator Garments Ltd. Manufactures custom-made suits tailored to the requirements of each customer. They use predetermined overhead absorption rates in allocating overheads to each job. In the cutting department, the rate is based on direct labour hours and in the stitching department the rate is based on machine hours. The management of Equator Garments Ltd., wants to set overhead absorption rates to help in determining prices in the next financial year. The cost accountant has provided the following budgeted data for the next financial year.

	Cutting	**Stitching**
Direct labour cost	Shs.1,200,000	Shs.750,000
Factory overhead	Shs.1,500,000	Shs.1,620,000
Direct labour hours	60,000	30,000
Machine hours	-	40,000

Required

Calculate the overhead absorption rates for each department

b) The following data relates to Job No.a4

	Cutting	**Stitching**
Direct materials	Shs.500	Shs.750
Direct labour hours	30	10
Machine hours	-	20

Administration overheads are absorbed at 25% on factory costs.

Profit mark-up is 331/3 % on cost.

Required

c) Prepare a cost statement for job A4 showing the price that will be charged to the customer.

At the end of the year, the following data was obtained:

	Cutting	**Stitching**
Hours actually worked		
Direct labour hours	68,000	30,000
Machine hours	-	17,000
Factory overhead cost incurred	1,600,000	760,000

Required

Calculate the amount of under or over absorption for each department. (Your attention is drawn to the interrelation between a, b, and c).

(Total:20 Marks)

QUESTION FIVE

Bogi and Whispers, Certified Public Accountants use a form of job order costing system.

An auditing client may be served by various members of staff who hold professional positions in the hierarchy, managers, and audit seniors to assistants. In addition, there are secretaries and other support employees.

Suppose that Bogi and Whispers have the following budget for 20X4:

	Shs
Compensation of professional staff	40,000,000
Other costs	24,000,000
Total budgeted costs	64,000,000

Each professional member of staff must submit a weekly time report, which is used to assign costs to jobs. An example is the time report of an audit senior:

Week of November 4, 20X4	S	M	T	W	T	F	S	Total
Chargeable hours:								
Client A		8	8	5				21
Client B				3		4		7
Non-chargeable hours:								
Professional development (attending seminars on computer auditing)					8			
Unoccupied time						4		4
TOTAL	0	8	8	8	8	8	0	40

In turn, these reports are used for charging hours to a client job-order, summarized as follows for Client A:

Week of Nov.	Nov. 11	Total hours	Billing rates	Total billed

	4				
Employees charged				Shs	Shs
Partner	4	4	8	1,000	8,000
Manager	4	4	8	600	4,800
Seniors	21	30	51	400	20,400
Assistants	48	70	118	200	23,600
	77	108	185		56,800

In many cases these job-cost sheets bear only a summary of the hours charged. Each class of labour is billed at an appropriate hourly rate, so that the job-cost sheet is the central basis for billing the client.

Required

a) Supposing this firm had a policy of charging overhead to jobs at a predetermined percentage of the salaries charged to the job. The experience of the firm has been that

chargeable hours average 80 per cent of available hours for all categories of professional staff. The non-chargeable hours are regarded as additional overhead. What is the overhead rate as a percentage of “direct labour” (the chargeable professional compensation cost)?

b) Compute the total cost of the Client A job for the two weeks that began November 4, 20X4. Assume that the average weekly compensation (based on a 40-hour week) of the personnel working on this job is: Partners, Sh.20,000; Managers, Sh.12,000; Audit Seniors, Sh.80,000; Assistants, Sh.4,000.

c) As the tabulation for Client A implies, the job order often consists of only the time and no cost. Instead, the revenue is computed via multiplying the time by the billing rates. Suppose the partners’ profit objective is 20% of the total costs budgeted, what predetermined percentage of the

salaries charged to the jobs would be necessary to achieve a total billing rate as a percentage of “direct labour”?

Very briefly state what use you might make of the data computed on the job orders in addition to billing.

(Total: 20 Marks)

QUESTION SIX

In a factory with for production departments and two service departments and two service departments, the operating costs for the month of October were as shown below. The costs of running the canteen in apportioned to department on the basis of the estimated use of the canteen by the employees in each department. Similarly, the cost of the boiler house is apportioned on the basis of the estimated consumption of power used by each department.

Cost for October were: Shs

Production department	1	200,000
	2	500,000
	3	300,000
	4	400,000
Service department		
Canteen		50,000
Boiler house		100,000
Total		1,550,000

The service departments are apportioned as follows:

		Canteen	Boiler house
Production department		%	%
	1	10	20
	2	30	10
	3	20	30
Service department	4	30	20
Canteen		-	20

Boiler house	10	-
Total	100	100

Required

a) Prepare a cost statement showing the costs of operating the four production departments

after the cost of the service departments have been re-apportioned. (15 marks)

b) Comment briefly on the problems associated with apportioning department costs

to productive departments. (5 marks)

(Total: 20 marks)

CHECK YOUR ANSWERS WITH THOSE GIVEN IN LESSON 9 OF THE STUDY PACK

LESSON FOUR

COST BOOK-KEEPING

OBJECTIVE

When you have studied this lesson, you should be able to:

- Explain the purpose of cost book keeping
- Display understanding of the concept of control accounts.
- Compare and contrast interlocking and integrated ledger systems
- Reconcile profits shown by financial and cost accounts

CONTENT

- The purpose of Cost Book Keeping
- Control accounts
- Interlocking ledger systems
- Integrated ledger systems

INSTRUCTION

- Read the study text

- Reinforcement Questions 4

INTRODUCTION

In cost **account accounts**, extensive use is made of control accounts which are based in the same principles as those used in financial accounts. Two basis accounting systems are normally used:

- Interlocking Cost Accounting System
- Integrated Cost Accounting System.

4.1.1 Interlocking Cost Accounting System:

Under this system, separate cost accounting and financial accounting books are maintained although both use the same basic accounting data. The financial accounting books have the normal and credit entries within themselves. In addition, a memorandum account also known as **Cost Ledger Control** accounts is maintained and all the items to be transferred to the cost accounts are posted in this account.

Cost accounting books on the other hand contain impersonal accounts necessary for costing purposes in addition to a **Financial Ledger Control Account**,

also known as **Cost Ledger Control Account** which enables the financial and Cost Ledger to be **interlocked**. The interlocking cost accounting system, costing and financial profit differ and have therefore to be reconciled at the end of the financial year.

4.1.2 Required Ledgers

In the financial Systems the required ledgers are:

a) The General Ledger
b) Debtors Ledger
c) Creditors Ledger

In the cost book-keeping system, the required ledgers are:

a) **General Ledger Adjustment Account**: It is sometimes called the cost ledger account. All the item extracted from the financial account are recorded in this account. The balance in this account represents the total of all the balances of the impersonal accounts extracted from

the financial books. It completes the double entry in the cost accounts.

b) **Stores Ledger Control Account**: This account shows all the transaction of materials e.g. purchases, issuance of materials, returns to suppliers etc. The balance of this account represents in total the detailed balance of the stores account.

c) **Work in Progress Ledger Control Account**: It shows the total work in progress at any particular time.

d) **Finished Goods Ledger Control Account**: Receipts from production and transfer to distribution department are entered in this account and the balance of this account shows the total value of finished goods in stock.

e) Production Overheads Control Account

f) Wages Control Account

g) Selling and Distribution Overheads Control Accounts.

h) Administrative Overheads Control Accounts.

4.2 Link Between Cost And Financial Books

The link between the two sets of books is achieved by operating a cost ledger control account and a financial ledger control account. (Cost Ledger Contra Account) in the financial and cost books respectively. In the cost ledger control account, all the items which affect the costs accounts are recorded, the same items are recorded in the financial ledger control accounts, but on the opposite side of the account hence the account completes the double entry. The Cost Ledger Control Account is just a memorandum entry and is therefore made in addition to the normal entries in the financial books of account. For example:

Materials Transaction

i. Purchase of Materials on Credit
ii. Return of Materials to Suppliers

iii. Purchase of Materials in Cash.

The above transactions affect both the financial accounts and cost accounts and the entries in the two sets of books will appear as follows:

In the Financial Books	In the Costing Books
Purchases on Credit:	
	Dr Stores Ledger Control a/c
Dr Purchases a/c	Cr General Ledger Adjustment a/c
Cr Creditors a/c	
Return of Materials to Suppliers	
	Dr. General Ledger Adjustment a/c
Dr Creditors	Cr. Stores Ledger Control a/c
Cr. Purchases a/c	
Purchases of Materials in Cash	
	Dr. Stores Ledger Control a/c
Dr. Purchases a/c	

Cr. Cash a/c	Cr. General Ledger Adjustment a/c

The following entries of material transactions affect only the cost books because they are merely transfers in the cost ledger:

Issue of Materials to Production

Dr. Work in Progress Ledger Control a/c
Cr. Stores Ledger Control a/c

Labor Transactions

(i) Wages Paid in cash

(ii) Wages incurred as a) direct labor or b) indirect labor

In the Financial Books	In the Costing Books
i. Wages Paid in Cash	
Dr Wages a/c	Dr Wages Control a/c
Cr Cash a/c	Cr General Ledger Adjustment a/c
ii. Wages Incurred as direct labour	

Not recorded in Financial Books	Dr. W.I.P a/c	
		Cr. Wages Control
	Dr. Production Overheads Control a/c	

Additional or Tutorial Note

A cost account ledger system is required to analyze accounting information in order that costs may be accumulated for individual cost centers and charged to cost units. The information in the cost ledger will be used for a range of planning, control and decision making purpose.

- The cost ledger control account in the financial ledger is a memorandum account which records the financial information, which has been extracted for use in the cost ledger.

- The financial ledger control in the cost ledger has two main purposes:
  (i) **It makes the cost ledger self-balancing**: It takes the place of an asset liability accounts in which one leg of the double entry would appear the financial ledger for each transaction e.g. the purchase of material on credit would be credited to sundry creditors control account in the financial ledger. In the cost ledger, it is credited to the financial ledger control account.
  (ii) **It enables an internal check to be performed by comparing its balances with that of the cost ledger control account in the financial ledger.** Both should record a balance which represents stock balances (Raw material, W.I.P and financial goods) the net profit, when all other transactions have been completed. Any difference should be investigated and

reconciled. Thus the **final trial balance** in the cost ledger will show:

	Dr	**Cr**
Stores Ledger Control a/c	x	
W.I.P. control a/c	x	
Finished Goods Control a/c	x	
Costing Profit and Loss a/c		x
Financial Ledger Control a/c		x

Illustration of the book keeping entries in a job costing system.

4.3 Reconciliation of profits disclosed by Financial Accounts and Costing Accounts in an interlocking system

When interlocking cost accounting system is applied, there will always be differences between the profit shown in the financial accounts and that shown in the financial accounts even if there are no errors in either accounts. This disparity in profits is caused by the different ways of recording accounting entries in the cost books and the financial books. For this reason, the two profit figures in the set of the two accounts should be periodically reconciled if they are to be meaningful. This reconciliation is done using an account know as the **Memorandum Reconciliation Account.** Differences between the profit figures in the cost books and the financial books are caused by factors **such as**

1. **Items Shown only by one set of Accounts** i.e. Items appearing in the financial accounts and not in the cost books and vice versa.

   (a) Item shown only in the financial books include:

- Losses on disposal of assets

- Stamp duty and other expenses on issues and transfers of capital stock (shares, bonds, debentures etc)
- Losses on investment
- Interest on bank loans
- Discounts on bonds and debentures.
- Dividends received
- Profits arising from sale of fixed asset
- Dividends paid
- Rent receivable but excluding that portion receivable from sub-letting part of the business premises if it has been included in the cost accounts.

(b) Items shown only in the cost books: These are normally notional charges therefore not real.

They include:

- Interest on capital employed in production
- Notional rental charges of premises owned

The above two notional costs represents the opportunity cost of employing the capital in the business rather than investing it outside the business.

2. Different bases of Stock Valuation

Stocks are valued differently, in cost accounts and financial accounts; the financial stock is valued at the lower of cost and net realizable value (mark value). The valuation of stocks in cost accounts is either based on LIFO, FIFO or weighted average. This use of different bases in valuing stocks will affect the profit/losses shown in the financial or cost accounts hence the need for reconciliation of the two.

3. Different Treatment of Overheads

In cost accounts, indirect expenses are recovered as overheads based on estimated expenditure and aligned with the estimated level of production. This

results in under or over-absorption of overheads and this must be taken into account when reconciling the profits of the two sets of accounts. In the financial accounts, however, indirect expenses are recorded at the actual cost and charged to the production account.

Illustration

The following are the final accounts of XYZ Limited for the year ending 31st December 1999

Manufacturing Trading Profit and Loss Appropriation Account

Total Factory Costs c/d	311,000	Sales	480,000
Finished Goods: opening stock	20,000		
Cost of Goods Manufactured			
And Transferred b/d	311,000		
	331,000		
Less Closing stock	(22,000)		
	309,000		
Gross Profit c/d	171,000		

	480,000		480,000
Expenses			
Office Salaries:	35,000	Gross Profit b/d	171,000
Office Expenses:	20,000	Dividends Received	3,000
Salesman Commissions	18,000	Interest on Bank Deposits	1,000
Selling Expenses:	15,000		
Loss on sale of land	1,000		
Distribution Expenses	13,000		
Interest on Mortgage	2,000		
Fines	1,000		
Net Profit c/d	70,000		
	175,000		175,000

Taxation	24,000	Net Profit b/d	70,000
Transfers to General Reserve	9,000	Retained Earnings b/f	36,000
Ordinary share dividend	18,000		
Preference Dividends	11,000		
Goodwill written off	37,000		
	106,000		106,000
		Retained Profit b/f	37,000

Additional Information

1. The cost accounting records show the following:

2. Profits were shs.114,000. Office salaries and office expenses provided for as (in the financial books)

   (i) Opening Stocks: Raw Materials 26,000

Work in Progress 21,000

Finished Goods 23,000

(ii) Closing Stocks: Raw Materials 30,000

Work in Progress 20,000

Finished Goods 24,000

Required

Prepare a memorandum Reconciliation account.

Solution

Memorandum Reconciliation Account

		Profits as Per Cost Books	114,000
Items not Debited in Cost A/Cs		**Items not Credited in Cost A/Cs**	
Stock Differences:		Dividends	3,0

Opening Stocks		Received	00
Of Raw Materials	1,00	Interest Received	1,00
Loss on Sale of Plant	1,00	**Differences in Stocks**	
Fines	1,00	W.I.P. (Opening Stocks)	2,00
Interest on Mortgage	2,00	Opening Finished Goods	3,00
Selling Expenses	15,000	W.I.P: Closing stocks	1,00
Salesman Commission	18,000		10,000
Distribution Expenses	13,000		
Stock Differences:			
Raw Materials: Closing	1,00		
Finished Goods: Closing	2,00		

Net Profit as Per the Financial Books:	70,000	
	124,000	124,000

Workings

	Financial A/Cs	Cost A/Cs	Differences
Work in Progress: Opening Stocks:	29,000	21,000	2,000
Finished Goods: Opening Stocks:	20,000	23,000	3,000
Raw Materials: Opening Stocks:	27,000	26,000	1,000
Closing Stocks:			
Work in Progress:	21,000	20,000	1,000
Finished Goods:	22,000	24,000	2,000
Raw Materials:	29,000	30,000	1,000

4.4 THE NATURE OF INTEGRATED ACCOUNTS

An integrated account, ledger system has a number of features which may be viewed as preferable to the interlocking ledger system. In recent decade there has in fact been a move towards greater integration of accounting information requirements in a single unified systems (an integrated ledger system), such an integrated ledger system liars the following advantages:

i. There is only one set of accounting records which is kept with sufficient analysis to enable the preparation of financial and cost accounting statements and to facilitate the control mechanisms undertaken by financial and management accountants.

ii. There is only one profit and loss account. This removes the possibility of Senior management confusion and frustration from the production of two seemingly different profit figures.

iii. There is no requirement to reconcile cost and financial accounting records.

iv. There is a removal of the duplication of effort and cost which arises when separate ledger are maintained.

v. The integrated ledger system fits in with the use of computer based information systems and a database approach to information availability and use.

Entries in the Integrated Ledger System

The integrated ledger system contains most of the entries in the interlocking ledger system. The financial ledger control account is no longer in use. The range of asset and liability accounts required for financial control purposes and for the preparation of financial accounting statements will incorporate the entries which would have appeared in the financial ledger control account.

EXAMINATION QUESTION

a) List and explain the reasons as to why profit or loss between cost and financial records may differ in an

interlocking accounting system.
(10 marks)

b) Interproducts Kenya Ltd. operates separate cost and financial accounting systems. The following balances from the final accounts of the company for both systems are available to you as the Company's Financial and Management Accountant.

c)

	Shs '000'
Net profits as per financial accounts	95,670
Net profits as per cost accounts	100,140
Dividends paid	1,800
	Shs '000'
Loss due to theft and pilferage charged in financial accounts	1,290
Stock depreciation charged to financial accounts	630
Stores adjustment credited in	345

financial accounts	
Bank interest credited in financial accounts	900
Interest received, not included in cost accounts	675
Depreciation recovered in cost accounts	5,925
Depreciation charge in financial accounts	5,490
Excess administration cost recovered	6,375
Factory cost under-recovered in cost accounts	8,550

Required

A reconciliation of the company’s cost and financial accounts. (10 Marks)

(Total 20 Marks)

Suggested Solution

December 1995 Question 3

a) Reasons why profit or loss between cost and financial accounts may differ in an interlocking system.

Solution

Generally when certain transactions are viewed differently in these systems, any profit or loss declared will not be the same.

Some of the items which lead to difference include:

- Items recorded in financial books but not in cost books and which tend to increase financial profits. These are mainly incomes and gains.

Examples

- Dividends received
- Interest received
- Discounts received
- Profits on disposal of assets

- Items recorded in financial books but not cost books which tend to decrease financial profits. These are expenses and loses. Examples:-

Interest and dividends paid

- Discounts allowed
- Capitalized items of profit appropriation i.e. income tax.
- Differences in overhead calculations
- Methods of stock valuation applied
- Items recorded in costing books and not in financial books. (10 marks)

b) Interproducts Ltd

Reconciliation Statement

	Shs '000'	Shs '000'
Profit as per financial accounts		95,670
Deduct items increasing financial profit		
Stores adjustment	630	
Bank interest	345	
Interest received	675	(1,650)

Add items decreasing financial profit		
Dividend paid	1,800	
Loss due to theft	390	
Stock depreciation	1,290	
Tax premium	900	
Depreciation charge	5,490	9,870
Deduct: Items tending to increase Cost profits		
Depreciation	5,925	
Excess administration costs	6,375	(12,300)
Add: Items in cost books tending to reduce cost profit		

Factory cost undercovered	8,550	8,550
		100,140

(10 marks)

Reconciliation Statement

	Shs '000'	Shs '000'
Profit as per cost accounts		100,140
Deduct items increasing costing profit		
Underabsorption	8,550	(8,550)

Add items decreasing costing profit		
Depreciation absorbed	5,925	
Overabsorption	6,375	12,300
Add items increasing financial profit		
Stores adjustment	630	
Bank interest	345	
Interest received	675	1,650
Deduct items decreasing financial profit		
Dividends paid	1,800	
Loss due to theft	390	
Stock depreciation	1,290	
Tax premium	900	
Depreciation charge	5,4	(9,8

	90	70)
Profit as per financial accounts		95, 670

REINFORCING QUESTIONS

QUESTION ONE

a) Explain the following terms as used in accounting for costs:

(i) Financial Accounting

(ii) Management Accounting

(iii) Cost Accounting (12 marks)

b) Explain how the following accounts are used in cost accounts

(i) Ledger Adjustment account

(ii) Stores Ledger Control Account

(iii) Work in Progress Ledger Control Account

(iv) Finished Goods Ledger Control Account (8 marks)

(Total: 20 marks)

QUESTION TWO

1. Explain the reasons that cause the profit figures in the cost accounting books and those in the financial books to be different. **(Total: 20 marks)**

2. The profit shown in the financial books as at 31 March 2004 was Sh.11,287 and for the same period, the cost accounting books showed a profit of shs.2,704. After checking the two sets of accounts for the source of

the differences, the following issues come to your attention:

	Cost Accounts	**Financial Accounting**
	Shs	Shs
Depreciation	9,826	10,520
Stock valuations		
Opening stocks	27,510	25,500
Closing stocks	18,218	18,750
Profit on sale of asset	-	850
Dividends Received	-	2,635
Imputed Rent Charge	3,250	-

Required:

Prepare a statement to reconcile the two profits, starting with the profit as per financial accounts.

(Total:20 Marks)

QUESTION THREE

The profit shown in the financial accounts is Shs.18,592 and for the same period, the cost accounts showed a profit of 20,496. Comparison of the two sets of accounts revealed the following:

Stock Valuations:	Cost Accounts	Financial Accounts
a) Raw Materials	Shs	Shs
• Opening Stock	6,821	7,259
• Closing Stock	5,483	5,128
b) Finished Goods		
• Opening Stock	13,291	12,905
• Closing Stock	11,430	11,131

Dividends and interest received of shs.552 and a loss of 1,750 on the sale of a milling machine were not entered in the cost accounts

Required

Prepared a reconciliation of the two profits. **(Total: 20 marks)**

QUESTION FOUR

The following are the final accounts of XYZ Limited for the year ending 31st December 2004

Manufacturing Trading Profit and Loss Appropriation Account

Total Factory Costs c/d	311,000	Sales	480,000
Finished Goods: opening stock	20,000		
Cost of Goods Manufactured And Transferred b/d	311,000		
	331,000		
Less Closing stock	(22,000)		
	309,000		

Gross Profit c/d	171,000		
	480,000		480,000
Expenses:			
Office Salaries:	35,000	Gross Profit b/d	171,000
Office Expenses:	20,000	Dividends Received	3,000
Salesman Commissions	18,000	Interest on Bank Deposits	1,000
Selling Expenses:	15,000		
Loss on sale of land	1,000		
Distribution Expenses	13,000		
Interest on Mortgage	2,000		
Fines	1,000		
Net Profit c/d	70,000		
	175,0		175,00

	00		0
Taxation	24,000	Net Profit b/d	70,000
Transfers to General Reserve	9,000	Retained Earnings b/f	36,000
Ordinary share dividend	18,000		
Preference Dividends	11,000		
Goodwill written off	37,000		
	106,000		106,000
		Retained Profit b/f	37,000

Additional Information

1. The cost accounting records show the following:

2. Profits were shs.114,000. Office salaries and office expenses provided for as (in the financial books)

(ii) Opening Stocks: Raw Materials 26,000

Work in Progress 21,000

Finished Goods 23,000

(ii) Closing Stocks: Raw Materials 30,000

Work in Progress 20,000

Finished Goods 24,000

Required

Prepare a Memorandum Reconciliation Account. **(Total: 20 Marks)**

CHECK YOUR ANSWERS WITH THOSE GIVEN IN LESSON 9 OF THE STUDY PACK

COMPREHENSIVE ASSIGNMENT No.2

To be carried out under examination conditions and sent to the Distance Learning Administrator for marking by the University.

Time Allowed: 3 Hours

Attempt any FIVE questions

QUESTION ONE

A retail company has been viewing the adequacy of its stick control systems and has identified three products for investigation. Relevant details for the three products are set out below:

Item Code	EOQ	Stock (Warehouse and Stores)		Weekly sales (Shs. '000')			Gross margin (See note 1)
	(000units)	(000 units)	(Shs/Un	Minimum	Normal	Maximum	(% of sales)

			it at cost)				
14/363	25	32.5	2.25	26	28	30	42
11/175	500	422.7	0.36	130	143	160	46
14/243	250	190	0.87	60	96	128	37

Note 1

Gross margin = sales – purchase cost of product

Outstanding order: item code 14/243 – order for 250,000 units placed 2 trading days ago.

There are 6 trading days per week.

All orders are delivered by suppliers into the retailer's central warehouse. The

lead-time is one week from the placement of order. A further week is required by the retailer in order to transfer stock from central warehouse to stores. Both of these lead times can be relied upon.

Required:

a) Calculate for each product

i. The minimum and maximum weekly sales units

ii. The stock re-order level

iii. The maximum stock control level (12 marks)

b) Comment upon the adequacy of the existing stock control of the three products. (8 marks)

(Total: 20 marks)

QUESTION TWO

a) What is ABC analysis? Briefly explain the Pareto principal as applied in
inventory control.
(6 marks)

b) What are the advantages and disadvantages of a centralized stores system? (7 marks)

c) What is meant by the term "imprest system of stores" (7 marks)

(Total: 20 marks)

QUESTION THREE

TINDO Ltd. Buys and sells products Q-3. it values stock on the basis of last in first out (LIFO). At June 2001, stock in hand consisted of 4,500 units, which were acquired at sh.50 per unit. The operations for the month were as follows:

Date	Purchases	Sales
June 1	5,000 @ sh.48	6,000 @ Sh.60

4			
5	5,500 @ Sh.49		
7	4,000 @ Sh.50		
11			7,000 @ sh.61
12	5,000 @ Sh.50		
13	6,000 @ Sh.47		
18			7,000 @ Sh.62
19			8,000 @ Sh.64
20		6,000 @ sh.49.50	
21			5,000 @ Sh.65
22		4,000 @ Sh.50	
25		6,000 @ Sh.49	

26	2,000 @ Sh.47	
28		500 @ Sh.60
29		14,000 @ Sh.64

The company incurred operating costs of Sh.450,000 during the month.

Required

a) Stores ledger card (14 marks)

b) Closing stock valuation (2 marks)

c) Trading account for the month. (4 marks) **(Total: 20 marks)**

QUESTION FOUR

a) What are the objectives of storekeeping? (4 marks)

b) Distinguish between continuous and perpetual inventory system. (4 marks)

Briefly describe the purpose and content of each of the following documents/records.

1. Bill of Materials
2. Purchase Requisition
3. Purchase Order
4. Delivery Note or Goods Received Note
5. Material Requisition Note
6. Material Return Note
7. Material Transfer Note
8. Bin Card
9. Stores Ledger Account
10. Stores Ledger Control Account
11. Inventory Tag
12. Stock Verification Report

(12 marks)

(Total: 20 marks)

QUESTION FIVE

a) What is the Economic Order Quantity? (3 marks)

b) What are the assumptions of the EOQ Model? (5 marks)

A company uses 50,000 rings per annum, which cost Sh.100 each. The ordering and handling costs are Sh.1,500 per order and carrying costs are 15% per annum of costs i.e. it costs Sh.15 per annum (15% x 100) to carry a ring in stock.

Required

Determine the EOQ using the following methods.

a) Tabular method (4 marks)

b) Graphical method (4 marks)

c) Algebraic formula method (4 marks)

(Total: 20 marks)

QUESTION SIX

Clearly distinguish CVP analysis and BEP analysis. (10 marks)

What assumptions underlie the CVP analysis? What is their effective implication?

(10 marks)

(Total: 20 marks)

QUESTION SEVEN

A firm has a contribution ratio of 45% and wants to earn an after tax profit of shs.72,000 and the firm operates in a 32% income tax rate bracket. It has fixed costs of sh.120,000 per annum, being the

administrator, marketing and distribution expenses.

Required

a) Compute the sales volume that will earn the shs.72,000 after tax profit. (5 marks)

b) What sales volume would earn 3 times the desired profit but before tax? (5 marks)

c) On the basis of the above results, compile proforma income statements for (a) and (b) to verify your results. (10 marks)

(Total: 20 marks)

QUESTION EIGHT

Maajabu Limited wishes to achieve excellent stock management so as to achieve a marvelous profit this year. Its management estimates the demand for its products to be 1000 units per annum, with a purchase price of shs.10 per unit, a holding cost of shs.0.75 per unit and ordering cot of shs.15 per order. The supplier of the stocks has presented Maajabu Limited with the following range of prices of the stocks:

Order size (in units)	Quantity Discount (%)	Price Per Unit (Shs)
0 – 99	0	10
100 – 199	1	9.90
200 – 399	2	9.80
400 – 599	4	9.60
600 – 799	5	9.50
800 – 899	5	9.50

900 – 999	5.5	9.45

Due to its storage capacity, the company can only purchase an amount of up to 600 units. Currently, the company is purchasing at optimum stock quantity to enable it achieve its objectives. The management is considering whether to shift from the current stock purchase policy to purchase the maximum stocks.

Required

a) Calculate the current EOQ in units. (4 marks)

b) Determine the total costs of stocks that arise due to the EOQ purchased (include the discount opportunity costs). (6 marks)

c) Advise the company whether it should change its policy. (10 marks)

(Total: 20 marks)

END OF COMPREHESIVE ASSIGNEMENT NO.2

NOW SEND YOUR ANSWERS TO THE DISTANCE LEARNING CENTRE

LESSON FIVE

INFORMATION FOR DECISION MAKING

OBJECTIVES

After you have studied this lesson you should be able to:

- Explain the nature of decision-making and the decision making cycle.
- Understand, explain and perform break-even point and cost volume point computations
- Explain the applications and assumptions of CVP analysis.
- Distinguish marginal costing and absorption costing.
- Apply marginal costing in stock valuation, profit reporting and decision making.
- Reconcile profits in marginal costs and absorption costing.

- Apply marginal costing principles in decision making situations.

CONTENTS

- Marginal costing
- Absorption Costing
- Break Even Analysis
- Decision Making

INSTRUCTIONS

- Read the study text
- Do the Reinforcing questions

INFORMATION FOR DECISION MAKING

INTRODUCTION

This lesson explores the use of cost accounting information for decision-making purposes.

MARGINAL COSTING AND ITS APPLICATION

- Definitions
- Applications
- Features

5.1 Marginal Costing And Absorption Costing

Product costs are costs identified with goods produced or purchased for resale. Such costs are initially identified as part of the value of stock and only become expenses when the stock is sold. In contrast, period costs are costs that are deducted as expenses during the current period without ever being included in the value of stock held. We saw how product costs are absorbed into the cost of units

of output. Now we describe marginal costing and compare it with absorption costing. Whereas absorption costing recognizes fixed costs (usually fixed production costs) as part of the cost of a unit of output and hence as product costs, marginal costing treats all fixed costs as period costs. Two such different costing methods obviously each have their supporters and we will be looking at the arguments both in favour of and against each method. Each costing method, because of the different stock valuation used, produces a different profit figure and we will be looking at this particular point in detail.

Marginal Cost and Marginal Costing

KEY TERMS

Marginal Costing_is an alternative method of costing to absorption costing

In marginal costing, only variable costs are charged as a cost of sale and a contribution is calculated which is sales revenue minus the variable cost of sales. Closing stocks of work in progress or finished goods are valued at marginal

(variable) production cost. Fixed costs are treated as a period cost, and are charged in full to the profit and loss account of the accounting period in which they are incurred.

Marginal Cost is the cost of a unit of a product or service which would be avoided if that unit were not produced or provided.

The marginal production cost per unit of an item usually consists of the following:

- Direct materials,
- Direct labour,
- Variable production overheads.

Contribution is the difference between sales value and the marginal cost of sales.

Contribution is of fundamental in marginal costing, and the term 'contribution' is really short for 'contribution towards covering fixed overheads and making a profit'.

The Principles of Marginal Costing

The principles of marginal costing are as follows:

- Period fixed costs are the same, for any volume of sales and production (provided that the level of activity is within the 'relevant range'). Therefore, by selling an extra item of product or service of the following will happen:
  - Revenue will increase by the sales value of the item sold,
  - Costs will increase by the variable cost per unit,
  - Profit will increase by the amount of contribution earned from the extra item.

Similarly, if the volume of sales falls by one item, the profit will fall by the amount of contribution earned from the item.

Profit measurement should therefore be based on an analysis of total contribution. Since fixed costs relate to a period of time, and do not change with increases or decreases in sales volume, it is misleading to charge units of sale with

a share of fixed costs from total contribution for the period to derive a profit figure.

When a unit of product is made, the extra costs incurred in its manufacture are the variable production costs. Fixed costs are unaffected, and no extra fixed costs are incurred when output is increased. It is therefore argued that the valuation of closing stocks should be at variable production cost (direct materials, direct labour, direct expenses (if any) and variable production overhead) because these are the only costs properly attributable to the product. Before explaining marginal costing principles any further, it will be helpful to look at a numerical example.

WORKED EXAMPLES

Marginal Costing

Water Ltd makes a product, the Splash, which has a variable production cost of Ksh.45,000 (production, administration, sales and distribution). There were no variable marketing costs.

Calculate the contribution and profit for September 19x0, using marginal costing principles, if sales were as follows:

a) 10,000 Splashes

b) 15,000 Splashes

c) 20,000 Splashes

Solution

The first stage in the profit calculation must be to identify the variable costs, and then the contribution. Fixed costs are deducted from the total contribution to derive the profit. All closing stocks are valued at marginal production cost (Ksh.6 per unit). For 10,000, 15,000 and 20,000 Splashes this would be,

	10,000 Splashes		15,000 Splashes		20,000 Splashes	
	Ksh.	Ksh.	Ksh.	Ksh.	Ksh.	Ksh.
Sales (at Ksh.10)				150,000		200,000
Opening stock	0		0		0	
Variable production cost	120,000		120,000		120,000	
	120,000		120,000		120,000	

	0		00
Less value of closing stock (at marginal cost)	60,000	30,000	- -
Variable cost of sales	60,000	90,000	120,000
Contribution	40,000	60,000	80,000
Less fixed costs	45.000	45,000	45,000
Profit/(loss)	(5,000)	15,000	35,000
Profit/(loss) per unit	Ksh .(0.50)	Ksh .1.00	Ksh .1.75
Contribution per unit	Ksh .4.00	Ksh .4.00	Ksh .4.00

The conclusions which may be drawn from the example are as follows:

a) The **profit per unit varies** at differing levels of sales, because the average fixed overhead cost per unit changes with the volume of output and sales.

b) The **contribution per unit is constant** at all levels of output and sales. Total contribution, which is the contribution per unit multiplied by the number of units sold, increases in direct proportion to the volume of sales.

c) Since the **contribution per unit does not change**, the most effective way of calculating the expected profit at any level of output and sales would be as follows:

- First calculate the total contribution,

- Then deduct fixed costs as a period charge in order to find the profit.

In our example, the expected profit from the sale of 17,000 Splashes would be as follows,

Total contribution (17,000 x Ksh.4)	68,000
Less fixed costs	45,000
Profit	23,000

So:

- If total contribution exceeds fixed costs, a profit is made,
- If total contribution exactly equals fixed costs, no profit and no loss is made and breakeven point is reached,
- If total contribution is less than fixed costs, there will be a loss.

Plumber Ltd makes two products, the Loo and the Wash. Information relating to each of these products for April 19X1 is as follows:

	Loo	Wash
Opening stock	Nil	Nil
Production (nits)	15,000	6,000
Sales (units)	10,000	5,000
	Ksh.	Ksh.
Sales price per unit		
Unit costs	20	30
Direct costs		
Direct materials	8	14
Direct labour	4	2
Variable production overhead	2	1
Variable sales overhead	2	3

Fixed costs for the month	Ksh.
Production costs	40,000
Administration cost	15,000
Sales and distribution costs	25,000

Using marginal costing principles, calculate the profit in April 19x1. Use the approach set out in Note (d) to the Water Ltd case, above.

SOLUTION

	Ksh.
Contribution from Loos (unit contribution =Ksh.20 - Ksh.16 = Ksh.4 x 10,000)	40,000
Contribution from Washes (unit contribution =Ksh.30 - Ksh.20 = Ksh.10 x 5,000)	50,000

Total contribution	90,000
Fixed costs for the period	80,000
Profit	10,000

Marginal Costing and absorption Costing Compared

Marginal Costing a**s** a cost accounting system is significantly different from absorption costing. It is an alternative method of accounting for costs and profit, which rejects the principles of absorbing fixed overhead into unit costs.

In Marginal costing:

Closing stocks are valued at **marginal production cost**,

Fixed costs are charged in full against the profit of the period in which they are incurred.

In **absorption costing** (sometimes referred to as **full costing**):

- Closing stocks are valued at full production cost, and including a share

of fixed production and include a share of fixed production costs.

- This means that the cost of sales in a period will include some fixed overhead incurred in a previous period (in opening stock values) and will exclude some fixed overhead incurred in the current period but carried forward in closing stock values as a charge to a subsequent accounting period.

This distinction between marginal costing and absorption costing is very important and the contrast between the systems must be clearly understood. Work carefully through the following example to ensure that you are familiar with both methods.

Worked Example

Marginal and absorption costing compared

Two Left Feet Ltd manufactures a single product, the Claud. The following figures relate to the Claud for a one-year period,

Activity level		50%	100%
Sales and productions (units)		400	800
		Ksh.	Ksh.
Sales		8,000	16,000
Production costs:	Variable	3,200	6,400
	Foxed	1,600	1,600
Sales and distribution costs:	Variable	1,600	3,200
	Fixed	2,400	2,400

The normal level of activity for the year is 800 units. Fixed costs are incurred evenly throughout the year, and actual fixed costs are the same as budgeted.

There were no stocks of Claud at the beginning of the year.

In the first quarter, 220 units were produced and 160 units sold.

Now:

a) Calculate the fixed production costs absorbed by Clauds in the first quarter if absorption costing is used,

b) Calculate the profit using absorption costing,

c) Calculate the profit using marginal costing,

d) Explain why there is a difference between the answers to (c) and (d).

Solution

a) The fixed production costs absorbed by Clauds in the first quarter (with absorption costing) are:

$$\frac{\text{Budgeted fixed production costs}}{\text{Budgeted output (normal level of activtiy)}} = \frac{£1,600}{800 \text{ units}}$$

Absorption rate = Ksh.2 per unit produced.

During the quarter, the fixed production overhead absorbed was 220 units x Ksh.2 = Ksh.440.

b) The under/over recovery of overheads for the quarter would be,

	Ksh.	
Accrual fixed production overhead	400	(1/4 of £1,600
Absorbed fixed production overhead	440	
Over absorption of overhead	40	

c) Profit for the quarter, absorption costing,

	Ksh.	Ksh.
Sales (160 x Ksh.20)		3,200
Production costs		

Variable (220 x Ksh.8)	1,760	
Fixed (absorbed overhead (220 x Ksh.2)	440	
Total (220 x Ksh.10)	2,200	
Production cost of sales	600	
Adjustment for over-absorbed overhead	1,600	
Total production costs	40	
Gross profit		1,560
Less: sales and distribution costs		1,640
Variable (160 x Ksh.4)	640	
Fixed (¼ of Ksh.2,400)	600	
		1,240
Net profit		400

d) Profit for the quarter, marginal costing

	Ksh.	Ksh.
Sales		3,200
Variable production costs	1,760	
Less closing stocks (60 x Ksh.8)	480	
Variable production cost of sales	1,280	
Variable sales and distribution costs	640	
Total variable costs of sales		1,920
Total contribution		1,280
Less:		
Fixed production costs incurred	400	
Fixed sales and distribution costs	600	
		1,000

	0
Net profit	280

e) The difference in profit is due to the different valuations of closing stock. In absorption costing the 60 units of closing stock include absorbed fixed overheads of Ksh.120 (60 x Ksh.2), which are therefore costs carried over to the next quarter and not charged against the profit of the current quarter. In marginal costing, all fixed costs incurred in the period are charged against the profit,

	Ksh.
Absorption costing profit	400
Fixed production costs carried forward in stock values	120
Marginal costing profit	280

We can draw a number of conclusions from this example:

a) **Marginal costing** and **absorption costing** are different techniques for assessing profit in a period.

b) If there are any **changes in stocks during a period**, marginal costing and absorption costing give **different results** for profit obtained:

- **If stock levels increase absorption costing will report the higher profit** because some of the fixed production overhead incurred during the period will be carried forward in closing stock (which reduces cost of sales) to be set against sales revenue in the following period instead of being written off in full against profit in the period concerned (as in the example above),

- **If stock levels decrease, absorption costing will report the lower profit** because as well as the fixed overhead incurred, fixed production overhead which had

been brought forward in opening stock is released and is included in cost of sales.

c) **If the opening and closing stock volumes and values are the same, marginal costing and absorption costing will give the same profit figure.**

d) **In the long run, total profit for a company will be the same whether marginal costing or absorption costing is used** because in the long run, total costs will be the same by either method of accounting. Different accounting conventions merely affect the profit of individual accounting periods.

PROGRESS CHECK

The overhead absorption rate for product X is Ksh.10 per machine hour. Each unit of product X requires five machine hours. Stock of product X on 1.1.X1 was 150 units and on 31.12.X1 it was 100 units. What is the difference in profit between

results reported using absorption costing and results reported using marginal costing? Is it::

a) The absorption costing profit would be Ksh.2,500 less?

b) The absorption costing profit would be Ksh.2,500 greater?

c) The absorption costing profit would be Ksh.5,000 less?

d) The absorption costing profit would be Ksh.5,000 greater?

Solution

The key is the change in the volume of stock. Stock levels have decreased therefore absorption costing will report a lower profit. This eliminates options (b) and (d).

Option (c) is correct because it is based on the closing stock only (100 units x 5 hours).

The correct answer is (a), based on the change in stock levels x fixed overhead absorption per unit

= (150 – 100) x Ksh.10 x 5 = Ksh.2,500 lower profit, because stock levels decreased.

Comparison of total profits

To illustrate the point about profit in the long-term, le us suppose that a company makes and sells a single product. At the beginning of period 1, there are no opening stocks of the product, for which the variable production cost is Ksh.4 and the sales price Ksh.6 per unit. Fixed costs are Ksh.2,000 per period, of which Ksh.1,500 are fixed production costs,

	Period	Period 2
Sales	1,200 units	1,800 units
Production	1,500 units	1,500 units

What would the profit be in each period using the following methods of costing?

a) Absorption costing. Assume normal output is 1,500 units per period.

b) Marginal costing.

Solution

It is important to notice that although production and sales volumes in each period are different (and therefore the profit for each period by absorption costing will be different from the profit by marginal costing), over the full period, total production equals sales volume, the total cost of sales is the same, and therefore the total profit is the same by either method of accounting.

a) Absorption costing: the absorption rate for fixed production overhead is,

$$\frac{£1{,}500}{£1{,}500 \text{ units}} = £1 \text{ per unit}$$

	Period 1		Period 2		Period 3	
	Ksh.	Ksh.	Ksh.	Ksh.	Ksh.	Ksh.
Sales		7,200		10,800		
Production costs						
Variable	6,000		6,000		12,000	
Fixed	1,500		1,500		3,000	
	7,500		7,500		15,000	
Add opening stock b/f	-		1,500		-	
	7,500		9,000		15,000	

Less closing stock c/f	1,500	-	-
Production cost of sales	6,000	9,000	
(Under-)/over-absorbed overhead	-	-	
Total production costs		6,000	9,000	15,000
Gross profit		1,200	1,800	3,000
Other costs		500	500	1,000
Net profit		700	1,300	2,000

b) Marginal Costing

	Period 1		Period 2		Period 3	
	Ksh	Ksh	Ksh	Ksh	Ksh	Ksh

	.	.	.	.	.
Sales		7,200		10,800	10,800
Variable production cost	6,000		6,000		12,000
Add opening stock b/f	-		1,200		-
	6,000		7,200		12,000
Less closing stock c/f	1,200		-		-
Variable production cost of sales		4,800		7,200	12,000
Contribution		2,400		3,600	6,000
Fixed costs		2,000		2,000	4,000
Profit		400		1,600	2,000

Note

That the total profit over the two periods is the same for each method of costing, but the profit in each period is different.

When opening stocks were 8,500 were 8,500 litres and closing stocks 6,750 litres, affirm had a profit of Ksh.62,100 using marginal costing.

Assuming that the fixed overhead absorption rate was Ksh.3 per litre, what would be the profit using absorption costing?

a) Ksh.41,850

b) Ksh.56,850

c) Ksh.67,350

d) Ksh.82,350

Solution

Stock levels reduced, therefore the absorption costing profit would be lower. You can eliminate options (c) and (d).

Difference in profit = (8,500 – 6,750) x Ksh.3 = Ksh.5,250

Absorption costing profit = Ksh.62,100 - Ksh.5,250 = Ksh.56,850

The correct answer is (b)

Marginal Costing and Absorption Costing compared: Which is better?

There are accountants who favour each costing method.

Arguments in favour of absorption costing are as follows:

- Fixed production costs are incurred in order to make output; it is therefore ‘fair’ to charge all output with a share of these costs.
- Closing stock values by including a share of fixed production overhead will be valued on the principle required for the financial accounting valuation of stocks by

Statement of standard accounting practice on stocks and long-term contracts (SSAP 9).

- A problem with calculating the contribution of various products made by a company is that it may not be clear whether the contribution earned by each product is enough to cover fixed costs, whereas by charging fixed overhead to a product it is possible to ascertain whether it is profitable or not.

Arguments in favour of marginal costing are as follows:

- It is simple to operate
- There are no apportionments, which are frequently done on the arbitrary basis, of fixed costs. Many costs, such as the managing director's salary, are indivisible by nature.
- Fixed costs will be the same regardless of the volume of output, because they are period costs. It makes since therefore, to charge them in full as a cost to the period.
- The cost to produce an extra unit is the variable production cost. It is realistic

to value closing stock items at this directly attributable cost.

- Under or over absorption of overheads is avoided.
- Marginal costing information can be used for decision-making but absorption costing information is not suitable for decision-making.
- Fixed costs (such as depreciation, rent and salaries) relate to a period of time and should be charged against the revenues of the period in which they are incurred.

Of course, the choice of method does not have to be between absorption costing and marginal costing. We looked at ABC as an alternative to absorption costing. **Attributable contribution costing** is another alternative. This involves attributing certain fixed costs to the activities which cause them and then using marginal costing to calculate a contribution for each activity, the surplus of contribution over attributable fixed costs being known as **attributable contribution.**

Summary

Absorption costing is most often used for routine profit reporting and must be used for financial accounting purposes. Marginal costing provides better management information for planning and decision-making.

Marginal cost is an important measure in marginal costing, and it is calculated as the difference between sales value and marginal or variable cost.

In marginal costing, fixed production costs are treated as period costs and are written off as they are incurred. In absorption costing, fixed production costs are absorbed into the cost of units and are carried forward in stock to be charged against sales for the next period. Stock values using absorption costing are therefore greater than those calculated using marginal costing.

Reported profit figures using marginal costing or absorption costing will differ if there is any change in the level of stocks in the period. If production is equal to

sales, there will be no difference in calculated profits using these costing methods.

SSAP 9 recommends the use of absorption costing for the valuation of stocks in financial accounts.

There are a number of arguments both for and against each of the cosign systems.

The distinction between marginal costing and absorption costing is very important and it is vital that you now understand the contrast between the two systems.

CHECK

- Define contribution
- How are stocks valued in marginal costing?
- If opening and closing stock volumes and values are the same, does absorption costing or marginal costing give the higher profit?
- What are the arguments in favour of the use of marginal costing?

Absorption rates under ABC should therefore be more closely linked to the

causes of overhead costs and hence product costs should be more realistic, especially where support overheads are high.

Distinction between marginal and absorption costing

These are two approaches of arriving at the **cost of production** or **net profit for a given period**. The main difference between absorption costing and marginal costing is on the treatment of the fixed cost

In absorption costing both variable and fixed production costs are included in the determination of the cost of a product. This implies that the fixed cost is treated as a product cost and not a period expense. It is important for the student to note the term “fixed production costs” as they are the only costs that make the difference between the marginal and absorption in costs of production.

In marginal costing only variable costs are included in the determination of the

production cost. This implies that fixed costs are treated as period costs:

- Period costs
- Product costs

Illustration 1

The following information was extracted from the book of Happy Ltd for the year ended 31/12/2001

Output	100000 units

Production costs

Direct labour cost	Shs 5 Million
Direct material cost	Shs 2 million
Variable overheads	Shs 2 million
Fixed overheads	Shs 4 million
Units sold	90,000
Selling price per unit	Shs 100.00

Assume closing stocks at the end of the previous period were nil.

Required

Using both absorption and marginal costing determine

i. Cost per unit
ii. Prepare the income statement

Solution

Marginal costing

i. Cost per unit $= \frac{(5+2+2)}{100000}$ million= Shs.9

Note:

Only variable costs are considered. Fixed overheads are not included in the cost per unit.

∴Total units sold = 90,000 x 90 = Shs 8,100,000

∴Closing stock value = 10,000 x 90 = Shs 900,000

Total costs (variable) for the goods produced

= 100,00 x 90 = shs.9,000,000 = cost of finished goods

Absorption costing

$$\text{Cost per unit} = \frac{5{,}000{,}000 + 2{,}000{,}000 + 2{,}000{,}000 + 4{,}000{,}000}{100{,}000} = \text{Shs } 130$$

Note

All costs (fixed and variable) are considered in arriving at the cost per unit.

∴Total cost of units sold = 130 x 90000 = Shs 11,700,000

Closing stock = 10,000 x 130 = 1300000

Total costs for goods produced = Shs 1,300,000 = cost of finished goods

ii. Income statement for the year ended 31.12.2001

Using	**MARGINAL COSTING**	**ABSORPTION COST**
	Shs	Shs
Sales 90,000 x 100	9,000,000	9,000,000

Cost of sales				
Opening stock	Nil		Nil	
Cost of finished goods	9,000,000		13,000,000	
Cost of goods available for sale	9,000,000		13,000,000	
Less closing stock	(900,000)		(13,000,000)	
Cost of goods sold		(8,100,000)		11,700,000
GROSS PROFIT/LOSS		900,000		(2,700,000)
Period costs				
Fixed overheads		(400,000)		-
Net loss		(3,100,000)		2,700,000

How can the above differences in net losses be explained?

Note that they are caused chiefly by the differences in cost of goods sold, which is in turn caused by the differences in the cost per unit for finished goods and closing stock

Reconciliation of marginal costing and absorption costing profits

Net loss as per absorption costing	(2,700,000)
Net loss as per marginal costing	(3,100,000)
Difference	400,000
Value of closing stock as per absorption costing	1,300,000
Value of closing stock as per marginal costing	(900,000)
	400,000

5.2 Application of marginal costing

5.2.1 Break-even analysis and break-ever charts

Break-even point is the volume of sales at which there is no profit or loss. Break-even charts graphically display the relationship of cost to volume and profits and show profit or loss at any sales volume within a relevant range

Approaches to break-even analysis

Contribution margin approach
An equation or a graph can be used to determine a company's break-even point

Example

Sales price per unit	Shs. 10
Unit variable expenses	Shs. 4
Fixed expenses	Shs. 3600

Contribution margin Shs. 10 unit sales price – E4 variable expenses = Shs. 6 unit contribution margin

Contribution margin may also be expressed as a total. The following equation indicates sales equal expenses because there is no income at the break-even point

x = Units to be sold at break even point

s = variable expenses + fixed expenses

Shs. 10x = Shs. 4x + Shs. 36000

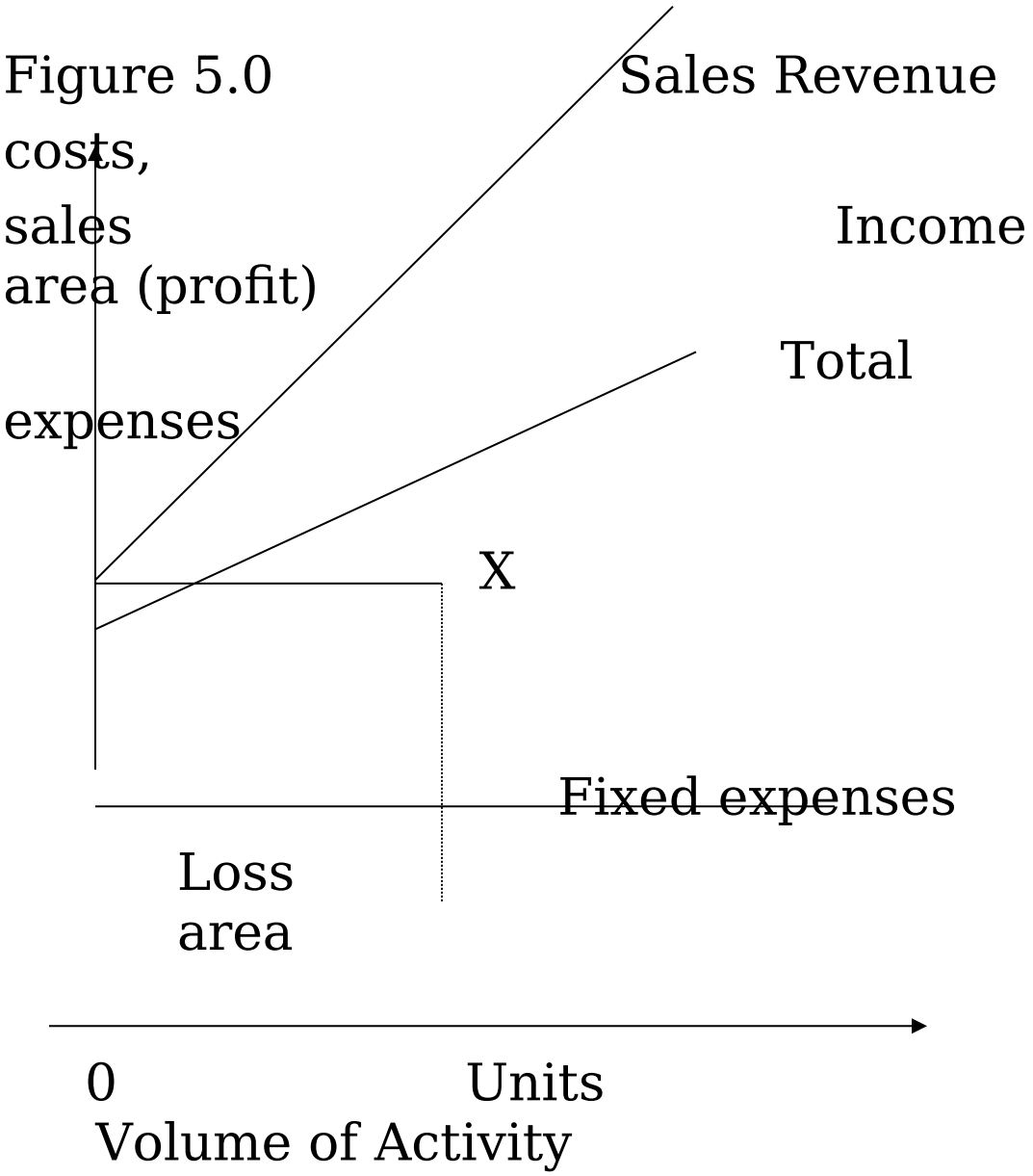
Shs.6x = Shs. 36000

x = $\frac{\text{Shs.36000 Fixed expenses}}{\text{Shs. 6 unit contribution margin}}$ = 6000 units to break-even

Break-even chart: It is a diagrammatic representation of the relationship between costs, expenses, prices and the sales volume.

A break-even chart expresses revenue, costs and expenses on the vertical scale. The horizontal scale indicates volume that may represent units of sales, direct labour hours, machine hours or other suitable cost drivers.

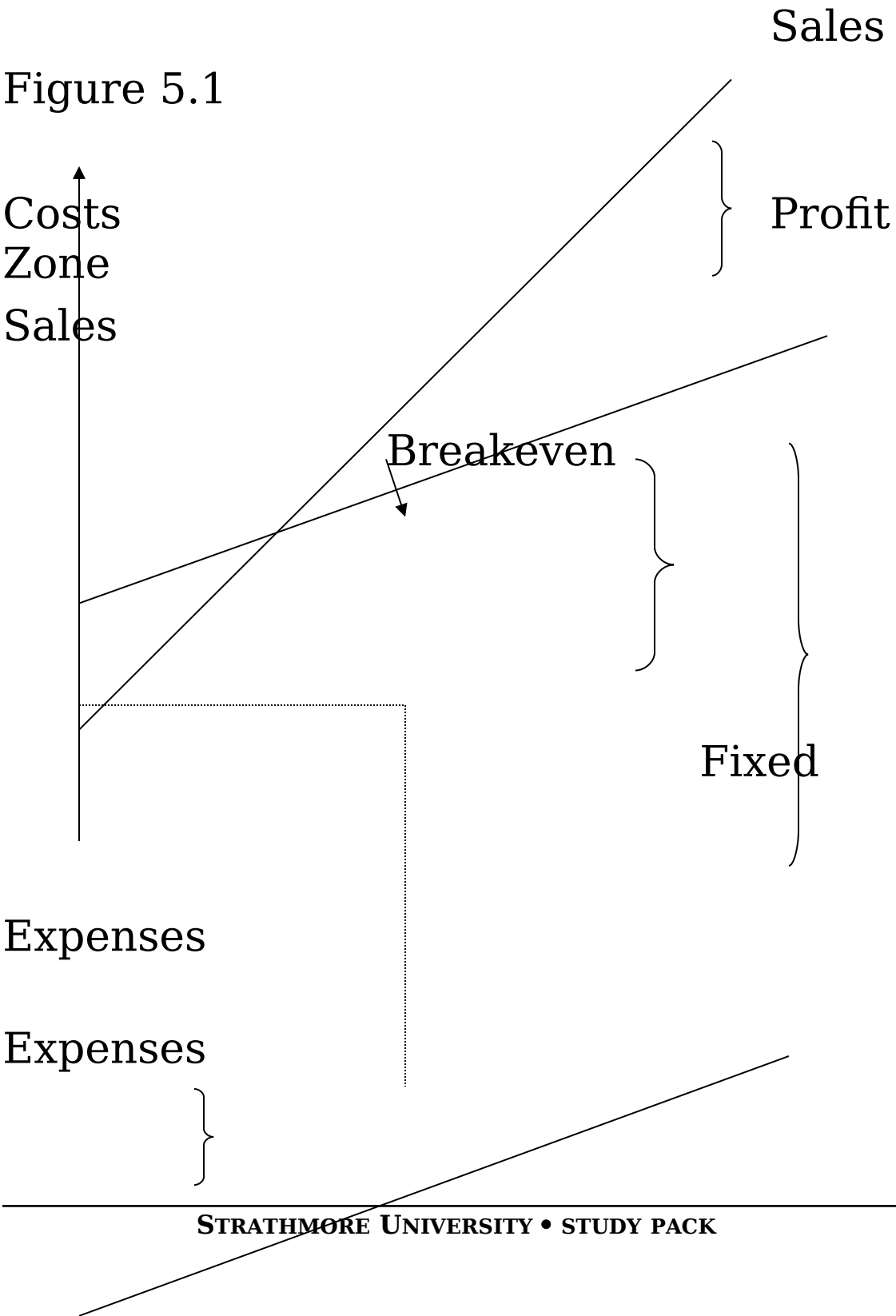
Figure 5.0

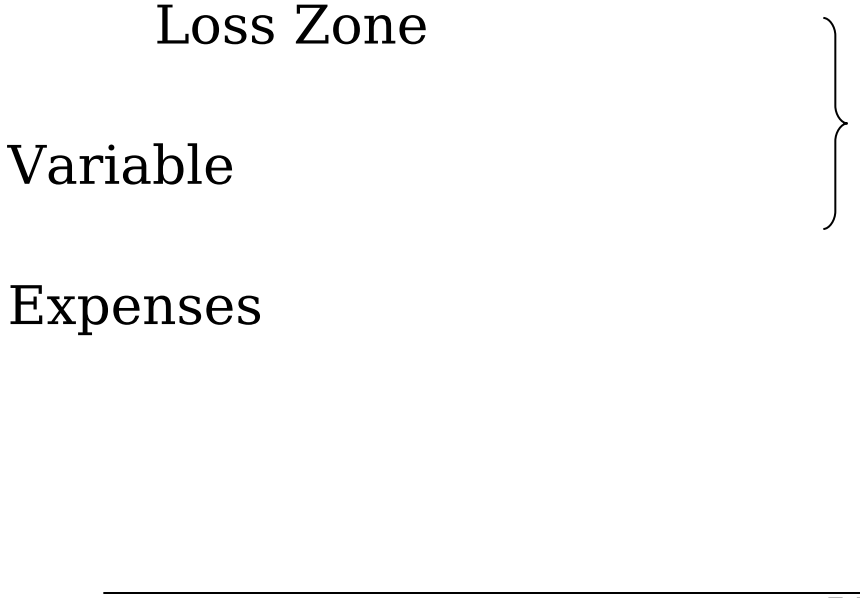


X = Break-even point, No loss, no profit point!

Break-even chart showing contribution margin

Figure 5.1





Assumptions of break-even analysis

1. The break-even chart is fundamentally a static analysis; normally changes can only be shown by drawing a new chart or a series of charts
2. Relevant range is specified to define fixed and variable costs in relation to a specific period and designated range of production level
3. All costs fall into either fixed or variable cost classification

4. Unit variable costs remain the same and there is a direct relationship between costs and volume
5. Volume is assumed to be the only important factor affecting cost behaviour
6. Unit sales price and other market conditions are assumed to remain unchanged
7. Total fixed costs remain constant over the relevant range considered
8. Inventory changes are so insignificant that they have no impact on the analysis
9. The technology level does not change.

5.3 Cost volume and profit analysis (CVP Analysis)

CVP Analysis examines the relationship between cost, activity level and the profit.

CVP Analysis assists in a wide range of profit planning and decision making situations including

a) The effect of production method changes

b) The effect of changes in product mix

c) The viability of special sales promotion campaign

d) The level at which service must be utilized to break-even

e) The impact of price changes on profit as price changes

5.3.1 CVP Analysis in conditions subject to change

Cost and revenue will change as well as sales volume due to a number of factors including:-

a) Increased competition may require selling price discounts in order to stimulate demand

b) Material prices, wage rates and overhead costs may all change because of the impact of inflation

c) Material usage may change where scrap is expected to fall because of improved methods, better trained workers or better material quality

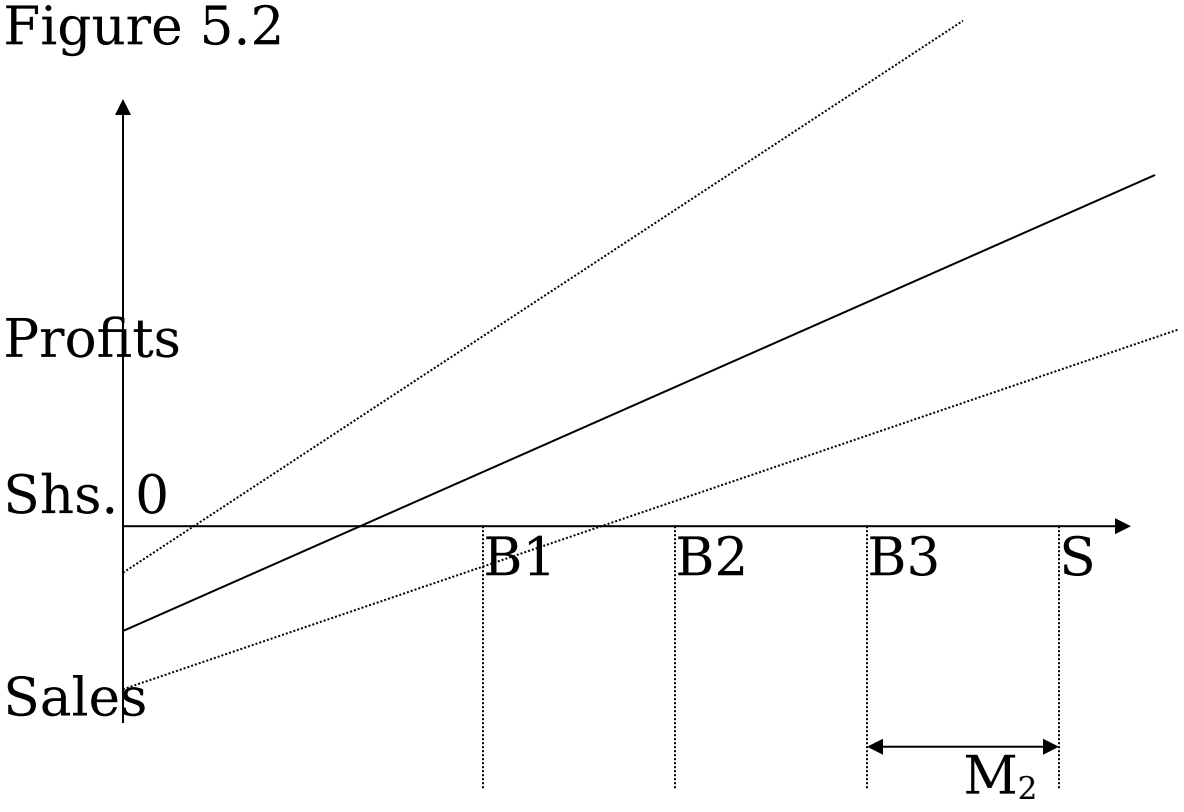
d) Labour efficiency may change where improved training programs or a reduction in labour turn over is expected to occur

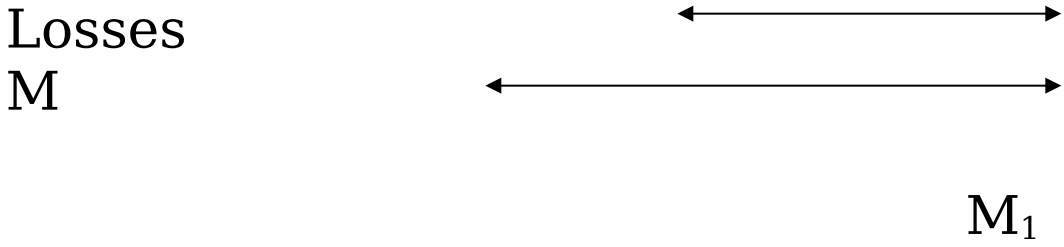
e) Overhead expenses may fall due to more efficient placement of order with suppliers who offer best terms

f) Product mix may change either as part of overall company strategy or due to increased competition

Changes in selling price and/or variable cost per unit

Figure 5.2





The contribution sales ratio is affected by any change in selling price and or variable cost per unit. This ratio is a measure of the rate at which profit is being earned and its size illustrated by the steepness of the slope of the profit volume graph

Line xy shows the existing profit curve for a company

Fixed costs = OY

The profit at sales volume OS = SX; break-even point occurs at point B and the margin of safety = M

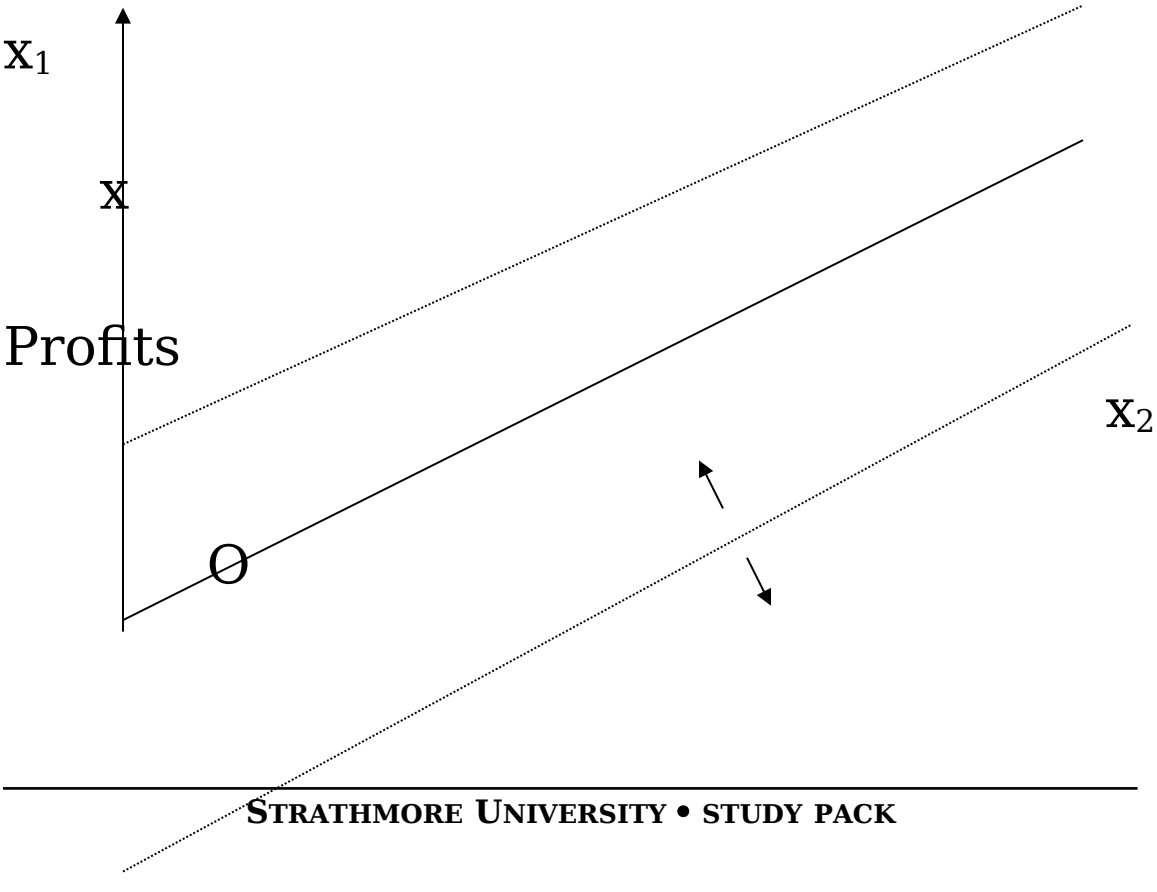
An increase in selling price and/or a decrease in variable cost per unit will increase the contribution; sales ratio resulting in a new point curve yx

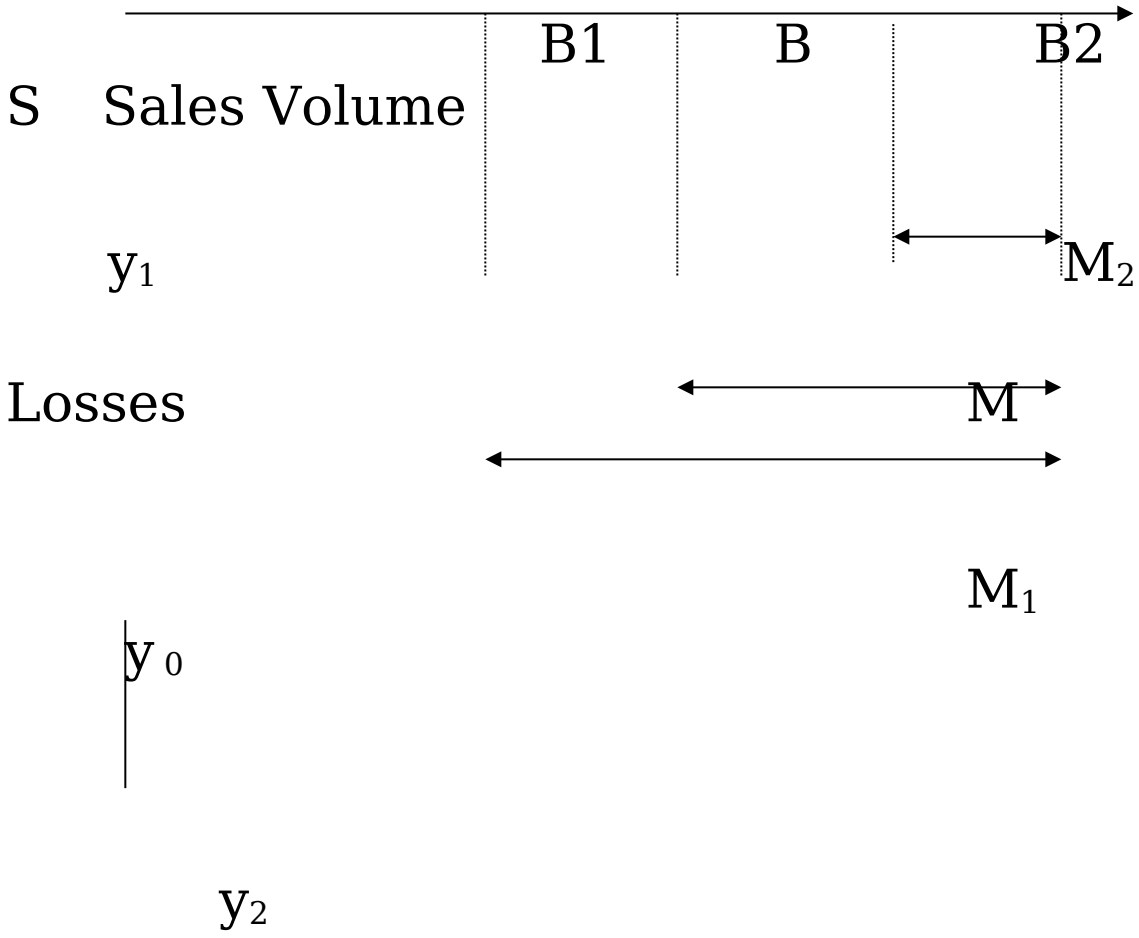
A decrease in selling price and/or increase in variable cost per unit will reduce contribution; sales ratio resulting in a new profit curve yx2

Change in fixed cost

In figure 5.3 graph yx shows the existing profit curve for a company with a fixed cost OY break=-even point B, margin of safety M, profit SX where sales volume is OS. A change in fixed cost does not affect the contribution to sales ratio, which is only influenced by selling price and variable cost per unit

Figure 5.3 Changes in fixed cost





Line y_1,x_1 shows the new profit curve when fixed costs are reduced to OY_1. The following should be noted

a) The profit at sales volume OS has increased to SX

b) Break-even point has been lowered to B

c) Margin of safety has been increase to M_1

d) Contribution sales ratio is unchanged

Changes in product mix

A change in product mix where individual products have different contribution will have different contribution. Sales ratio will result in a change in overall profit curve

Illustration 2

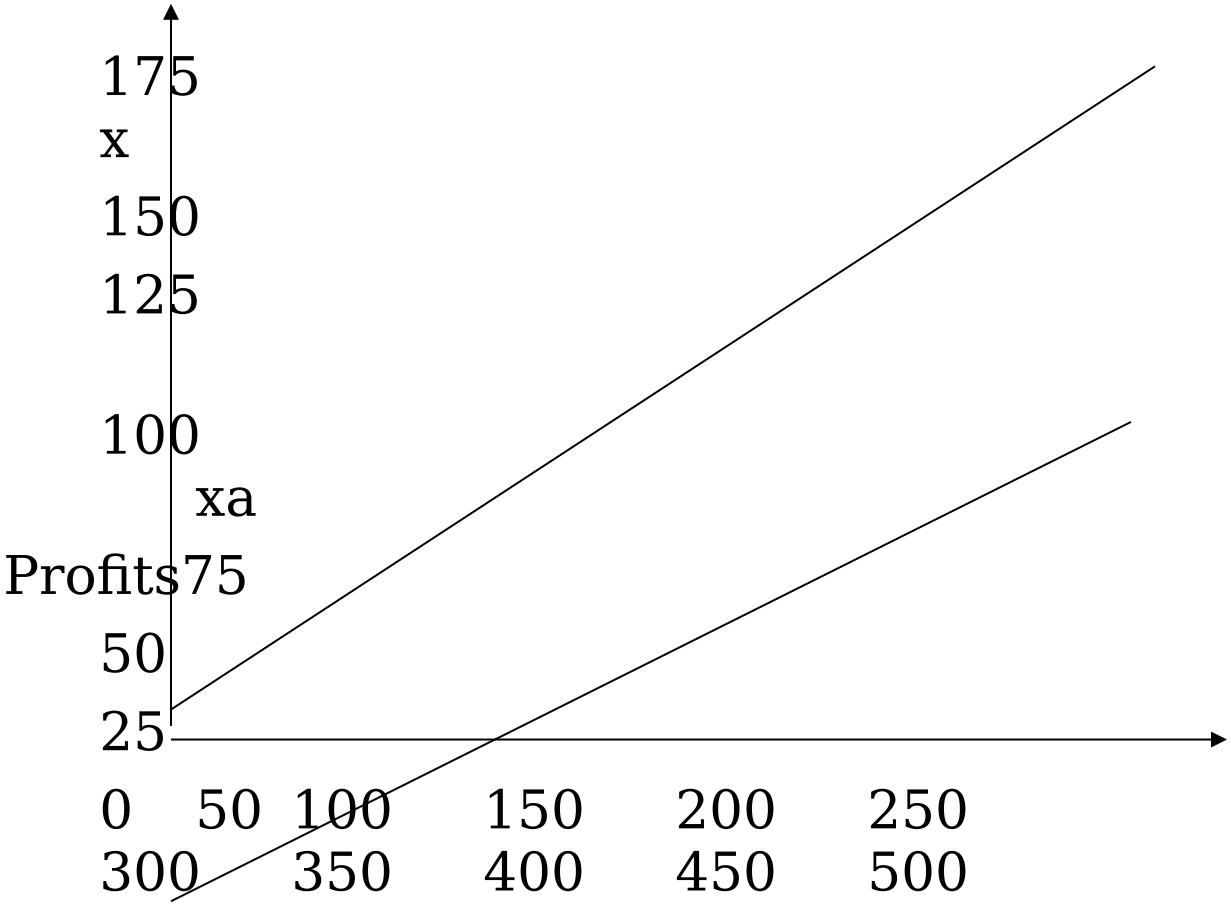
The summary results of Donlon Ltd are as follows:

Product	A	B	C	Total
	Shs.000	Shs.000	Shs.000	Shs.000
Sales revenue	300	200	100	600
Variable costs	150	120	70	340
Contribution				260
Fixed costs				100
Net profit				160
Contribution sales ratio	0.5	0.4	0.3	0.433

Required

1. Prepare a profit volume graph which shows the overall results for Donlon Ltd
2. Prepare an amended profit curve where the market forces have led to a switch of Shs. 200,000 of sales from product A to product C
3. Prepare a summary which shows the value of each of the following for both the original results and the amended results
   a) Net profit
   b) Break-even point
   c) Margin of safety
   d) Overall contribution sales ratio

Solution


175
x
150
125
100
xa
Profits 75
50
25
0 50 100 150 200 250
300 350 400 450 500
-25
(sales Shs.000)
-50
-75
-100 y

The above profit volume graph shows the existing and amended cost curves for Donlon Ltd. The amended data which implements the switch of Shs. 200,000 of sales from product A to product C may be summarized as follows:

Product	A	B	C	Total
	Shs.000	Shs.000	Shs.000	Shs.000
Sales revenue	100	200	300	600
Variable costs	50	120	210	380
Contribution	50	80	90	220
Fixed costs				100
Net profit				120
Contribution sales ration	0.50	0.40	0.30	0.367

Note

That the variable costs for product A are reduced proportionally while those of product C are increased proportionally to the change in sales value according to

the variable cost: sales ratio for each product

The original curve is YX and the amended profit curve is Yxa

The following summary information may be read from the profit volume graphs

Product mix	Existing	Amended
Net profit Shs.000	160	120
Break even point Shs.000	230.77	272.73
Margin of safety Shs.000	369.23	327.27
Contribution sales ratio	0.433	0.367

5.3.2 CVP and computer applications

The wide availability of personal computers encourages more managers to apply cost volume profit analysis

Computers can quickly make the computations for changes in the assumptions identifying proposed projects e.g. computer spreadsheets allow managers to determine the most profitable combination of selling process, variable and fixed cost volume. A manager enters into the computer various numbers for price and cost in an equation based on CVP relationships to yield target income for each combination because of a computers speed and accuracy in providing this information the manager can select the most profitable actions

Limitations of CVP Analysis

The use of the basic CVP model is only relevant to planning and decision-making in an activity range in which the basic cost and revenue behaviour assumptions are valid. Outside the relevant range, CVP techniques may still be applied so long as the varying cost and revenue behaviour patterns are taken into consideration.

However, the limitations o CVP analysis are actually its assumptions, which do not hold outside the relevant range!

DECISION MAKING

Nature of Decision-making

Decision-making may fall into any of the following categories

1. Short run operational decisions
2. Short run tactical decisions
3. Longer term strategic planning decisions

Short run operational decisions are made in relation to the achievement of short-term output requirements. A decision may be made to work overtime in a department in order to have a job completed in accordance with a scheduled delivery date to the customer. Such decisions are aimed at ensuring that the current business plan is achieved

Short run tactical decisions are related to specific events which management wish to decide upon and which will change the future operation of the business in some

way. Its time horizon is short and it is usually the next 12 months

Longer term strategic planning is more concerned with the overall direction of the business plan. It may have a time horizon of 5 to 10 years. For example should a decision be made to install a fully automated production line to replace existing labour intensive machine process. These decisions require consideration of factors such ass

- The level of market likely to be available in future
- An estimation of changing price levels
- The timing of cash flows in relation to the decision
- The degree of uncertainty estimated in relation to data used in the evaluation of the situation
- The strategy which competitors are likely to implement
- The cost of capital or target rate of return

The decision making cycle

Steps in decision-making cycle are:

a) Clearly define the objective, which is to be the focus of the decision. This is important in order that the decision makers have a well-defined problem which has to be solved and not a vague idea which lacks clarity.

b) Consider the alternative strategies available to the satisfactory attainment of the objective. This is important in order that the final decision agreed upon has taken account of all relevant possibilities.

c) Gather relevant information in order to compare alternative strategies in quantifiable terms. This may require considerable thought and effort in order to ensure that all relevant data are obtained.

d) Consider the qualitative factors, which are likely to influence the decision. This is important as an element in decision making. There may be non-quantifiable costs and benefits, which lead to the final

choice of strategy being other than that giving the highest quantifiable return.

e) Compare the alternative strategies using both quantitative and qualitative data and then make a final decision.

f) Re-evaluate your decision; determine if you are achieving the objectives and if not, repeat the process.

Relevant costs and decision-making

The relevance of costs will depend upon the purpose for which they are being used. Relevance is related to future decisions

The relevance of costs in decision-making is related to whether they are avoidable in relation to the decision made or if they are unavoidable, in that they will remain irrespective of the decision taken.
Relevant costs in decision-making are therefore said to be **incremental** and **future** costs relating to the decision to be made. Costs are incremental if they will result in a difference e.g. avoidable

costs result in reduced cots if they are avoided. Future costs are those costs that have not yet been incurred i.e. they are not sunk costs or committed costs. This is explained further in this text.

5.3.3 Limiting factors and decision making

A limiting factor may be defined as ‘any factor, which has a limiting effect on the activities of an undertaking at a point in time over a specific period’

The decision-making strategy, which managements wish to pursue, may be constrained because of shortage of manpower, machinery, material, money, markets or a combination of these. It may also be affected by the availability of management expertise and methods improvement capability.

In short term decision making where one or more factors will limits the strategy which may be implemented, it is likely that profit maximization will be seen as a major decision making goal. It should be noted however that in practice a number of goals will form part of the objective of

an organization. In addition to short term profits management will wish to consider a number of longer term goals, for example

- Consolidation of market share
- Product leadership
- Good industrial relations
- Improving longer term productivity and profitability
- Quality leadership
- Employee and customer satisfaction
- Social responsibility

This balance between short and long term goals is likely to lead to decisions which are profit satisfying rather than profit maximizing resulting in the satisfactory profit level being earned in the short term

5.3.4 Single Limiting factor

Where a single limiting factor exists the decision making sequence may be implemented as follows:-

- Calculate the contribution per unit of limiting factor for each product
- Rank the products in order of size and contribution per unit of limiting factor
- Allow any minimum retention of less profitable products which is decided upon
- Use up the total units of the limiting factor in order to fulfill the forecast quantities in order of product ranking.

Illustration 1

A company manufacturers and sells three products A,B & C. The unit cost and revenue structure for each product and its maximum forecast demand for the coming period are as follows:-

Product	A	B	C
Selling price per unit (Shs.)	140	100	120
Variable cost per	70	60	80

unit (Shs.)			
Maximum demand (units)	500	300	300
Machine hours required per unit	10	4	5

The company has a maximum of 6000 machine hours available during the coming period

Required

1. Calculate the number of units of each product A, B, and C which should be produced and sold in order to maximize profit
2. Calculate the maximum profit earned from the decision strategy per 1
3. Suggest other factors which management may wish to consider which could result in a change in their decision
4. Calculate the product units to be produced and sold and the net profit earned if the company wish to

maximize sales of product A because it is thought to be a future market leader

5. Calculate the product units to be sold and the net profit earned it the company agree to produce a minimum of 70% of the maximum demand of each product in order to maintain market spread.

Solution

	A	B	C	Total
Maximum demand (units)	500	300	300	
Machine hours per unit	10	4	5	
Machine hours required	5000	1200	1500	7700
Machine hours available				6000
Shortfall				1700

The above calculation confirms that machine time is a limiting factor, which will restrict the number of products, which can be produced and sold

Product	A	B	C	Total
Contribution per unit (Shs.)	70	40	40	

Contribution per machine hr (Shs.)	70	10	8	
Product ranking	(3)	(1)	(2)	
Machine hours utilized	3300	1200	1500	
1. Product units produced and sold	330	300	300	
Contribution earned (Shs.)	23100	12000	12000	47100
Less fixed cost				20000
2. Net profit				27100

3. The profit maximizing mix may not be implemented where management wish to maintain a more balanced market mix or where there they wish to concentrate on a future market leader. In addition they may wish to explore the possibility of sub contracting some production or of acquiring additional machinery either on hire or part of a long term expansion of capacity

4. Where the sales of product A are to be maximized because it is thought that it will be a future market leader, the analysis sequence is:

   a) Utilize the machine hours required to maximize production of A i.e. 500 units x 10 hour = 5000 hours

   b) Use the remaining 1000 machine hours to produce B and C in their ranking order

Product B has a higher contribution per machine hour. The 1000 machine hours available are sufficient to produce 1000/4 = 250 units of B. This is less than its maximum demand. There are no hours left in which to produce product C.

The sales and profit strategy is therefore:

	Units	Contribution per unit	Total

			Shs. l
Product A	500	70	350 00
Product B	280	40	100 00
Product C	Nil		
			450 00
Less fixed cost			200 00
Net profit			250 00

5. Where sales have to be spread in order to satisfy 70% of the maximum demand of each product as the first criterion the analysis sequence is

   a) Utilize the machine hours required to produce 70% of the maximum production of each product

   b) Use the residual hours up to the maximum of 6000 hours to produce additional units of the product in their ranking up to the maximum

demand in each case so far as it is possible

	A	B	C	Total
Maximum units	500	300	300	
70% of max units	350	210	210	
Machine hours	3500	840	1050	5390
Residual hours usage	-	360	250	610
Total machine hours used	3500	1200	1300	6000
Total units	350	300	260	
Total contribution Shs.	24500	12000	10400	46900
Less fixed cots				20000
Net profit				26900

5.3.5 Direct cost as a relevant cost

Direct costs may be directly chargeable to a product or a cost center. They may be fixed costs or variable costs when it comes to decision-making.

Illustration 2

A summary of the profit and loss reported in each of 3 product lines B, C, and D is as follows:

	Product B	Product C	Product D
	Shs.000	Shs.000	Shs.000
Sales revenue	60	40	40
Less variable cost	40	30	42
Contribution	20	10	(2)
Less fixed	15	12	10

cost			
Net profit (loss)	5	2	(12)

Required

1. Comment on the financial situation as presented in the above summary
2. Comment on a decision to discontinue product C where
   a) 60% of the fixed costs charged to it relate to advertising of product C and are avoidable if discontinued OR
   b) All of the fixed costs charged to product C are avoidable if discontinued
3. Discuss whether product D should be discontinued if

   a) 90% of the fixed costs charged to it are company costs arbitrarily apportioned to it Or
   b) Eliminating of its variable cost would result in an increase in material cost for products B and C because of lost discounts which would

have the effect of increasing their variable costs by 5% OR

c) Products B and D are complementary products whose sales demand is directly related to that of each other

Solution

1. The existing figures show that products B and C are making a contribution towards fixed costs whereas product D is in a negative contribution situation. The cash out flow directly related to product D are not paid for by the cash in flows from sales revenue. Product B shows a net profit of Shs. 5000 whereas product C shows a net loss of 2000. The question data has not indicated whether the fixed costs allocated to each product are an arbitrary apportionment of the total company fixed cost

2.

a) Where 60% of the fixed costs charged to product C relate to advertising of the product and are avoidable if it is discontinued, it is earning a net contribution or net margin of Shs. 10000 – (60% x Shs. 12000) = Shs. 2800. This means that Product C is contributing to the net cash in flows of the company and should be retained in the short term if no more profitable use of the capacity if available

b) Where all the fixed costs charged to product C are avoidable if it is discontinued, this means that they are directly attributable to product C. the net loss of Shs. 2000is a true measure of its effects on company cash flows. If the position cannot be improved the company will save Shs. 2000 in the short term by discontinuing product C

3.

a) Product D has a negative contribution of Shs. 2000, if 10% of the fixed costs charged to it are directly attributable to the product

this adds a further Shs. 1000 (10% x 10000) to its adverse effect on company cash flow

b) The variable costs of products B and C would increase by 5% if product D is discontinued

Increase in cost of products B and C
= 5% x Shs.40000 + Shs. 30000)
= Shs. 3500
Savings by discontinuing product D = Shs. 2000
Net benefit of retaining product D = Shs. 1500

In this situation the discontinuance of product D will result in net loss to the company of Shs. 1500 because of the increased costs of products B and C due to loss of discount

c) If products B and D are complementary products, their position must be examined. If product D is discontinued this implies that product B sales will be lost. Product B currently earns a contribution of Shs. 20000, which far outweighs the

negative contribution of Shs. 2000, which results from product D. Both products should be produced and sold

5.3.6 Incremental costs as relevant costs

An incremental cost is specifically incurred by the following a course of action and avoidable if such action is not implemented. This contrasts with sunk costs, which have already been incurred and cannot be avoided whether the future course of action is taken. Incremental costs are relevant in decision-making situations such as

a) Whether to buy in a component or service or manufacture it using the company's own resources

b) Whether to further process one of the joint products which emerge from a process before it is sold or sell it in its existing form without further processing

Example 3

A company currently makes a component which has the following unit cost structure

Direct Material	Shs. 100
Direct Wages	Shs. 200
Variable overhead	Shs. 50
Fixed Overhead	Shs. 140
Total	Shs. 490

Required

Advice management whether the component should be bought in from an outside company for Shs. 330 per unit

Solution

1. The total cost of manufacture of the component is Shs. 490 per unit
2. The apparent saving by buying in the component is Shs. (490 – 330) = 160
3. If the fixed overhead cost is an apportionment of the company fixed overhead, which will be avoidable if production is discontinued, the relevant cost of manufacture is Shs. 350. This assumes that the direct material, direct wages and variable overheads are all directly variable with the production of

the component. This still leaves the purchase of the component for Shs. 330 a cheaper option than manufacture at a relevant cost of Shs. 350

4. Other factors which are non quantifiable in short term should be considered however before a final decision is made

   a) Will the quality of the bought in component be as acceptable as that manufactured internally?

   b) Will the outside supplier be able to supply the components as required or will there be production delays because of late delivery?

   c) Will there be industrial relations problem because of the loss of jobs by workers who currently make the component?

5. Further analysis of the solution may reveal that the production capacity currently used to make the component could be used as an alternative manufacturing opportunity which could be sold externally and yield a

contribution equivalent of Shs. 50 for each component it replaces

5.3.7 Opportunity costs are relevant costs:

Opportunity cost introduces an additional concept which is not available as part of normal cost analysis in the accounting record system

Opportunity cost may be defined as ‘the best opportunity foregone by following a particular course of action’ it may be redefined as the net cash flow lost by choosing one alternative rather than another.

Opportunity cost may be used in a number of decision making situations where there is an alternative choice between possible future course of action examples are:

a) Whether to close a department immediately or in one years time

b) Whether to operate an internal service department or to use an outside service

c) Whether to accept one or another of two mutually exclusive contracts

Opportunity costs will be part of an incremental cost and revenue analysis in many decision making situations

Illustration 4

A company has material B in stock, which originally cost Shs. 5000 for the 1000 Kshs in stores. The material is left over from an old purchase order. The company is now considering to use it on contract X. The alternative course of action to using material on contract X is;-

a) 600 kg could be used in contract Y instead of buying similar material at Shs. 3 per kg.

b) A further 250 kg could be sold as scrap at Shs. 1 per kg

c) The remainder will have to be disposed at a cost of 50 pence per kg

Required

Prepare a summary which shows the opportunity cost of using material B on contract X

Solution

The information may be presented in more than one way. An approach which focuses on each individual cash flow for each alternative is useful where the decision making situation becomes more

complex, because it adopts a detailed analysis, which is easy to follow. Alternatively, the net costs and benefits may be summarized for use in the alternative choice decision.

a) Showing all relevant cash flows	**Accepted Contract**	**Reject the contract**
	X	X
Cash in flows		
Scrap sales (250 kg x Shs. 1.00)		250
	Nil	250
Cash outflows		
Contract Y purchases (600 kg x Shs. 3)	1800	-
Disposal cost (150 kg x Shs. .5)		75
	1800	75
Net cash inflow/outflow	(1800)	175

The opportunity cost (net outflow) if material B is used on contract X is Shs. 1975

Using a net costs and benefits summary if material B is used on contract X:

	Shs.	Shs.
Benefits		75
Disposal cost avoided		
Less costs		
Contract Y purchases	1,800	
Scrap sales foregone	250	2,050
Opportunity cost		1,975

REINFORCING QUESTIONS

QUESTION ONE

XYZ Company manufactures a product called “PERMA”. Pertinent cost and revenue data relating to the manufacture of this product is given below:

	Shs
Selling price per unit	66

Variable production cost per unit	44
Variable selling cost per unit	4
Fixed production cost (total)	Shs.200,000
Fixed selling and administrative cost (total)	Shs.99,000

Required

a) Calculate the break-even sales level in shillings;

b) Suppose the company desires to make a profit of shs.195,000, what should be the output in units?

c) A new machine, which is more efficient, is installed. This machine increases the fixed production cost by 20% but reduces the variable production cost per unit by 30%. What is the new break-even point in sales revenue?

d) State five limitations of break-even analysis. **(Total: 20 marks)**

QUESTION TWO

Explain 10 limitations of Break-even analysis. **(Total: 20 marks)**

QUESTION THREE

a) Explain the following terms as used in CVP analysis.

Break-even charts

i. Variable cost ratio
ii. Contribution margin ratio
iii. Margin of safety
iv. Profit volume ratio
v. Marginal Income Ratio

(12 marks)

b) A company has the following costs;

	Shs
Employee's salaries	17,000
Rent insurance	11,000
Depreciation on equipment	2,000
Variable costs	6,.000
	24,000

All other costs except those indicated as variable are fixed. The selling price per unit of output is Shs.10. The above variable costs relates to 6,000 units output.

Required

i. Calculate the Break-even point
(4 marks)

ii. Calculate the cash flow break-even point (4 marks)

(Total: 20 marks)

QUESTION FOUR

a) Explain the term depreciation tax shield and its important in break-even analysis. (5 marks)

b) Repeat Question 4 b(ii) above, but assume that tax rate is 48%. (10 marks)

c) From your results, what do you observe? (5 marks)

(Total: 20 marks)

CHECK YOUR ANSWERS WITH THOSE GIVEN IN LESSON 9 OF THE STUDY PACK

LESSON SIX

COSTING SYSTEMS

OBJECTIVES

- Define and explain the features of the various costing methods,
- Understand the environment under which the various product costing methods are applicable.
- Perform product costing computations.

CONTENTS

COSTING SYSTEMS

- The flow of costs in business enterprise
- Selection of a cost accounting system
- Product costing methods

SPECIFIC ORDER COSTING

Job order costing

- Definition and operation of job costing
- Ledger entries for job costing

Batch costing

- Contract costing
- Contract costing features
- Contract cost accumulation and control (contract accounts)
- Contract price and profit recognition
- Contract accounting and calculation of balances for balance sheet purposes

Operational costing

- Process costing
- Process costing environment
- Normal and abnormal process losses
- Process accounts
- The concept of equivalent units
- Valuation of work in progress
- Accounting for joint and by-products

Service costing and output costing

- Service cost situations

- Service cost analysis
- Output costing

Other costing methods

- Activity based costing
- Unit and uniform costing
- Target costing
- Back flush costing

Reinforcement Questions
Comprehensive Assignment 3

6.1 SPECIFIC ORDER COSTING

This is a broad costing system, which is applicable where work jobs consist of separate jobs, batches or contracts. Each job, batch or contract is a cost unit and in most cases, it is different from another. Each order made can be identified separately and the system is designed to find the cost of each order. Specific order costing is subdivided into:

a) Job costing
b) Batch costing
c) Contract costing

6.1.1 JOB COSTING

This is a costing method which is applied when a job/cost unit is relatively of **small size**, is undertaken to fit the **customer's specifications**_ and is of comparatively **short duration:** Each job moves through the operations continuously as an identifiable unit. The method is usually adopted by businesses, which

receives orders for work peculiar to the needs of individual customers.

a) Features of Job costing

Product is against the customer's order and not on job stocks
Each job has its own characteristics and requires special attention and skills.

b) Procedures of Job Costing

The application of job costing method begins when a customer's order is received. After accepting an order, an individual work/job order number is assigned to each job for or separate order identification.. Production order is then made giving authority for the job to start. A job cost account for each job is then opened. In this account, all costs relating to that particular job are recorded and this account closed only when the job is complete. After completion of the job, an invoice is prepared and served to the customer.

- Materials for each job are made using material requisition forms

- Labour is charged on the basis of the amount of time used to complete that particular job as recorded in time-keeping records.
- Overheads are charged on the basis of an predetermined overhead absorption rate.
-

Applied Overhead absorption rate = Budgeted Overheads ÷ Denominator value

The Denominator value where the denominator value refers to units of some specified overhead absorption base e.g. machine hours, direct labour hours.

6.1.2 Accounting for Job Order Costing

1. (a) Direct materials

(i) Dr Stores ledger control A/c Cr Cash A/c – for cash purchasers X

(ii) Dr Stores ledger control A/c Cr Creditors A/c – for credit purchasers X

(b) Return of materials to suppliers

Dr Cash A/c or creditors control A/c X

Cr Stores ledger control A/c X

(c) Issue of materials from the store

Dr – W.I.P. Control A/c X

Cr stores ledger control A/c for direct materials. X

Indirect materials: Dr Factory overheads control A/c X

Cr Stores ledger control A/c X

2. Direct Labor

Dr W.I.P. Control A/c

Cr Cash A/c

3. Accrued Direct Wages

Dr W.I.P. Control A/c

Cr Wages Control A/c

Indirect Wages

Dr Factory overheads control A/c

Cr Wages Control A/c

4. Production Overheads

(i) (not yet paid) Dr Factory overhead control A/c

Cr Expenses/Creditor control A/c

(ii) (When paid) Dr Expense/creditors A/c

Cr Cash A/c

Note

Overheads entries apply when there is an interlocking accounting system.

5. Finished goods transferred to the store:

Dr Finished goods stock control A/c

Cr W.I.P Control A/c

6. Sale delivery of finished goods to customers:

(i) On Credit: Dr Debtors control A/c Cr Sales A/c

(ii) In Cash: Dr Bank/Cash A/c Cr(Sales A/c

7. Cost of goods sold to customers:

Dr Cost of sales A/c

Cr Finished goods control A/c

8. (i) When there is over absorption of production overheads:

Dr Factory overheads control A/c

Cr P & L A/c

(ii) When there is under absorption of production overheads:

Dr P& L A/c

Cr Factory overheads control A/c

9. When there are non-manufacturing overheads:

Dr P & L A/c

Cr Non-manufacturing overheads control A/c or non-manufacturing overheads/expenses are regarded as period costs & are therefore not changed To W.I.P control A/c.

Job Cost Account

	Dr		Cr
Direct materials issued from stock	X	Materials returned to the store	X
Direct wages	X	Materials transferred to other jobs	X
Production overheads absorbed	X	Cost of completed jobs transferred to finished goods A/c	X
Materials transferred from other jobs	X	Balance c/d (Total cost of that job)	X
	XX		XX

Illustrations:

The following transactions were made by Z limited in the month of December.
Direct Materials

- 8,000/= was bought on credit, out of these, materials worth 5,000/= were returned to the suppliers.
- 50,000/= was issued from the store
- Indirect materials issued amounted to 5,000/=
- Direct wages allocated to production amounted to 20,000/=
- Goods worth 200,000/= were sold
- Finished goods worth 100,000/= were transferred to the store.
- The cost of goods sold was 140,000/=
- Unpaid indirect expenses were 32,000/=
- Indirect wages allocated amounted to 15,000/=
- Non-manufacturing overheads incurred amounted to 20,000/=
- Overhead expenses charged to the jobs – 60,000/=

Required

a) Prepare the stores ledger control A/c
b) Factory overhead control A/c
c) W.I.P. control A/c
d) Costing P & L A/c

Stores Ledger Control A/c

Creditors (material)	8,000	Creditors control	5,000
		W.I.P (Indirect materials)	50,000
		Factory overheads	5,000

Factory Overheads Control A/c

Stores Ledger (material)	5,000	W.I.P	60,000
Creditors (wages)	32,000		
Incurred wages	15,000		
P + LA/c Overabsorption	8,00		

	0		
	60,000		60,000

W.I.P Control A/c

Stores Ledger (material)	50,000	Finished goods stock control	100,000
Control (D wages)	20,000		
Overhead expenses	60,000		

Costing P and L A/c

Finished goods control	140,000	Sales	200,000
Non manufacturing Overheads	20,000	Factor overhead absorption	8,000
Costing profit	48,000		

6.2 BATCH COSTING

This is a type of job costing that is used when production consists of limited repetitive work and definite number of item manufactured in one batch. A batch is defined as a cost unit consisting of a group of identical item in particular sizes and colors of shoes, toys, spare parts etc. The total cost incurred in production is spread on the number of units made when the batch is completed.

a) Procedures:
- Allocation of batch number
- Production order is made
- Creation of batch costs account
- Completion of the work and closure of the batch cost account
- Allocation of costs to individual units in the batch
- Determination of selling price/batch and unit.

Illustrations

The budgeted variable overheads of Githurai Ltd for the year 2001 are given as below:

Department	Overhead(shs.)	Absorption base
A	150,000	15,000 direct labour hours
B	200,000	25,000 direct labour hours
C	120,000	20,000 direct labour hours
D	300,000	30,000 machine labour hours

Additional Information

- Selling and administering overheads are changed at 10% of total production costs while the profit mark up is 25 of total costs:
- An order for 2,000 units was received from a customer. The batch number of this order is 510. The following additional information in respect of this batch is provided below:
- Direct materials – 87,000/=
- Direct Labor – Dept A (150 direct labor hrs) – 12shs. Direct labor hour.

- Dept B (40 direct labor hrs) @ 15shs. Per hr
- Dept C (60 direct labor hrs) @20shs. Per hr
- Dept D (100 direct labor hrs) @10shs. Per hr

A total of 50 machine hours were used in this job

Required

a) Calculated the total cost of the batch
b) Cost/Unit
c) Selling Price of the batch
d) Selling Price unit

Solution

Githurai Limited			
Batch 510			
Particulars			Shs.
D Materials			87,000
D Labour:	Dept A (150 x 12)	1,800	
	Dept B (40 x 50)	6000	
	Dept C (60 x 20)	1,200	
	Dept D (100 x 10)	1,000	4,600
Prime Cost			91,600
Variable Overheads:	Dept A – 15,000/15,000 x 150	1,500	
	Dept B – 200,000/25,000 x 40	320	
	Dept C – 120,000/20,000 x 60	360	
	Dept D –	500	2,6

	300,000/300,000 x 50	80
Total Production Cost		94,280
Selling and admin costs – 10% (94,280)		9,428
Total Costs		103,708
Mark-up: Mark-up @ 25% x 103,708		25,927
Cost/Unit = 103,708/2000 units = 51.854	Selling Price unit = 129,635/2,000 = 64.8175	

6.3 CONTRACT COSTING

This is a form of specific order costing that is applied to relatively large cost units, which normally take a considerable length of time to complete e.g. building or construction works. Contract jobs are undertaken in accordance with specific requirements of contractee/Customer. Contracts may be distinguished from job orders by the following features:

The money value of a contract is much **larger** than that of a job order.

- A contract consumes significantly larger amounts of resources than a job order.
- For a contract, special progress reports are usually made while in job costing, reports are made after the completion of the job.
- For a contract, indirect costs are relatively smaller in relation to direct costs but the vice versa is time for job order.

To second the progress of contract works, a special account known as a contract account is maintained.

6.3.1 CONTRACT ACCOUNTS

This is a separate account that is opened and maintained for each contract undertaken for the purpose of accumulating cots. Each contract is given a number and all costs relating to that particular contract are recorded in this account. A typical contract account is as shown below:

Contract No. XYZ Account

Materials b/f	x	Materials returned to store	x
Materials purchased	x	Materials c/d	x
Direct wages	x	Machinery c/d	x
Indirect wages	x	Balance c/d: Cost of work done	x
Subcontractors fees	x		
Cost of special plant	x		
Machinery/ Plant b/f	x		

Cost of work done b/d	x	Value of work certified	x
Notional Profit	x	Cost of work done but not certified	x
	xx		xx

Contract Costing Terminology
Principles of profit income recognition in contracts

The Notional Profit

It is a component of 2 items:

a) **Profit taken** = Notional profit x 2/3 x cash received/work certified
This formula of calculating the part of national profit taken in the year is used when substantial costs have been incurred on the contract but the contract is not near completion. But when the contract is near completion the profit taken is calculated as:
Profit taken = Estimated profit x cash received/contract price.

Where Estimated profit = Contract price – Estimated total cost and

Estimated total cost = Costs incurred to date and estimated future costs.

b) **Profit not taken** = refers to the part of the national profit that is not recognized in the current period. It is profit carried forward to be recognized in the years that follow.

c) Retention Money

This is a portion of the value of work certified that is retained by the contractor to protect himself from faulty work that might be evident at the time of progress payments or at the completion of the contract. This amount is released after satisfactory performance under the contract.

Illustration

XYZ limited has been awarded a contract to build a house. This is a contract No 45 for the company and the contract price is shs.2.65 million. At the end of the company's financial year, the contract was 85% complete and hence regarded as being near completion. You are also provided with the following information about the contract:

Particulars	Shs.
Materials purchased and delivered	580,000
Materials issued from store	60,000
Materials returned to stores	7,000
Site expenses	300,000
Site wages	200,000
Plant sent to site	100,000
Architect's fees	30,000

Plant returned from site	10,000
Subcontractor's fees	105,000
Head Office overheads absorbed	60,000

Valuation at the year ending disclosed the following:

	Shs
Materials:	19,500
Plant on site	50,000
Work done but not yet certified	60,000

Additional Information

1. The portion of the work which was completed during the year and certified by the architect was assessed as representing 75% of the whole contract price. The contractee made payments to this extent less 10% retention money.
2. The management of the company decided for the purpose of preparing the company's annual accounts to make a provision of a third of the national profit against the possibility

of defects and other contingencies arising later in respect of the work already certified for payment.

Required

a) The contract account
b) Amount of profit or loss to be taken to the main profit and loss account of the company.
c) Value of work in progress.

XYZ LTD
Contract No 45 A/c

	Shs		Shs
Materials	580 ,0	Materials	9,000
Purchased:	00	Returned to stores	
Materials issued from stores	6,000	Plants returned from site	10,000
Site expenses	300,00 0	Materials c/f	19,500
Site wages	200,00 0	Plant c/f	50,000
Plant set to site	100,00 0	Cost of work done	1,346,5 00
Architects fees	30,000		
Sub-contractors	105,00 0		
Head office overheads	60,0 00		
	1,435, 500		1,435,5 00
Cost of work done b/d	1,346, 500	Value of work certified	
National		75% x	1,987,5

profit: 701,000		2,650,000	00
Profit taken:	473,175	Work done but not certified (closing stock)	60,000
Profit in suspense	227,825		2,047,500*
Balances b/f: materials	19,500		
	50,000		
Plant	60,000		
Work not certified			

Profit taken

$$= \text{National Profit} \times \frac{\text{Cash Received}}{\text{Contract Price}}$$

$$= 701{,}000 \times \frac{(90\% \times 1{,}987500)}{2{,}650{,}000} = 701{,}000 \times \frac{1{,}788{,}75}{2{,}650{,}00}$$

$$= 473{,}175$$

Profit in Suspense = 701,000 – 473,175

= Shs. 227,825

Value of Work in Progress

	Shs.
Cost of work certified	1,346,500
Add: Profit taken	473,175
	1,819,675
Less: Cash Received	(1,788,750)
Work in progress valuation:	30,925

6.4 PROCESS COSTING

This is a costing method that is applied where there are standard operations with continuous production of homogeneous as identical units. Hence the output is the final product of a sequence of operations. In this type of costing, costs are accumulated on the basis of process, and the cost per unit is arrived at by dividing the total process costs by the number of input of the next process and further materials can be added at each stage production. Therefore cost per unit for the second and subsequent

processes is a cumulative cost for example, the cost per unit for the output transferred from process 2 is the cost of production for both process 1 and 2 and not for process 2 above. The fact that the output for the first process becomes the input for the next process means that the process costing procedure strives to maintain the cost of each process product and charge that with the first process. The aim is to transfer the cost accumulated in the first process to the next process. This is illustrated below:

Process 1

	Shs		Shs
Direct Material:	1,000	Transferred to	
Direct Labour	500	Process 2:	3,000
Overheads	1,500		3,000
	3,000		3,000

Process 2

	Shs		Shs
Transfer from		Transfer to	

Process 1:	3,000	Finished Goods:	6,000
Direct material	1,500		
Direct labour	1,000		
Overheads	500		
	6,000		6,000

Examples of Industries where process costing is applied

6.4.1 Process Costing Procedure

1. The production factory is divided into a number of processes.
2. An account is opened and maintained for each process.
3. Each process account is debited with materials, labor, direct expenses and overheads apportioned to the process.
4. The output of a process is transferred to the next process input of that process.
5. The finished output of the last process is transferred to the finished goods account.

6.4.2 VALUATION OF WORK IN PROGRESS

The concept of Equivalent units

Equivalent Units

This is a notional quantity of completed goods in the production process. It is a collection of work application (direct materials, direct labor and overheads) necessary to produce one complete unit of output. They are the number of units that would have been produced during a period of all the departments' efforts had resulted into completed units.

The concept is used for purposes of translating the partially completed production into its completed units equivalent. This enables cost accountants to value the work-in-progress in an objective, consistent, reliable manner.

Illustration 1

Suppose there are 4,000 units of a product in ending inventory out of which 60% are fully complete whereas the

remaining are 70% complete. What are the equivalent units of the product?

Solution: 60% x 4,000 = 2,400 units fully complete.

40% x 4,000 = 1,120 units –Equivalent units.
Total Equivalent units = 3,520 units
Assume we had total process costs of shs.7,040, then each unit would cost shs.7,040/3,520=shs.2

Illustration 2

Material A is added at the beginning of a production process. Labor and overheads are added continuously during the production process. At the end of the process, 10,000 units were complete and 2,000 units were 60% complete as per labor and overheads. The cost of raw materials used during the period amounted to shs.220,000, labour shs.150,000 and overheads shs.74,000. There was no opening inventory.

Required

Determine the cost per unit of both the completed units, and the units in the ending inventory.

Solution:

	Physical Units	**Materials**	**Conversion (direct Labour and overheads**
Completed	10,000	10,000	10,000
Ending Inventory	2,000	2,000	1, 200
Equivalent Units	12,000	12,000	11,200
Cost for the Period		220,000	224,000
Cost per Equivalent Unit:	Shs.18.33	220,000/1,200=sh18.33 224,000/11,200=sh20	
Total Cost/Equivalent Unit	=18.33+sh. 38.33		

In the above illustrations, there is no opening work in process. When it exists, we need to adopt a method of valuing it and incorporating it into the process accounts. The two main methods used for purposes of valuing the opening work in progress:

1. Weighted Average Method
2. First In First Out (FIFO) Method.

Using these methods enables the cost of the opening work in progress to be appropriately assigned to the finished goods an the closing work in process.

a) Weighted Average

When this method is used, all costs of production are considered in assigning costs to inventory. The method puts together opening work in process inventory costs and cost of production. **It mixes the costs of previous period with those of current period in determining costs per unit.**

Under this method, equivalent units are calculated as follows:

Equivalent Units = Units completed and Transferred + Ending work in progress inventory: (% completion)
Cost per Equivalent Unit = Previous Period costs + Current period costs

In beginning working process

Equivalent units of work done.

Under weighted average approach, we do not distinguish the “units started and completed in the current period” from the `units completed and transferred ` and the `Ending working period`

a) First In First Out (FIFO)

This method considers only those costs incurred during the current period. Equivalent units are calculated as follows:

Equivalent Units= Units completed and transferred + (Units in ending W.I.P x % of completion – Units in beginning)

X % of completion

Cost/Equivalent Unit = Current Costs

Equivalent Units

Carefully Note that FIFO distinguishes the “units started and completed in the current period” from the units completed and transferred. This is done by subtracting the “beginning W.I.P.” from the “units completed and transferred” and “the ending work in process”.

Illustration

The following work in progress account relates to the blending department of ABC Limited, a soft-drinks company for the month of January 1999. Raw materials were introduced at the start of the work while labour and overheads were incurred through-out the blending process.

Blending Department: W.I.P A/C

Particulars	Shs	Particulars	S

			h
Bal b/f = 5,000L (4/5) =	65,000	Completed and transferred out: 29,000L	-
Raw materials added (30,000L)	125,000	Ending W.I.P (2/3) 6,000L	-
Direct Labour	145,000		
Factor Overheads	201,000		

Additional Information

1. Beginning W.I.P. consists of the following:
   - Raw materials shs.15,000
   - Direct Labor shs.20,000
   - Factory Overheads shs.30,000.

Required

Calculate cost/equivalent units using:

a) Weighted average

b) FIFO

Weighted Average

	Total Physical Units	Materials	Conversion
Completed Transferred Out:	29,000	29,000	29,999
Ending W.I.P	6,000	6,000	4,000
			(2/3 X 6,000)
	35,000	35,000	33,000
Process Costs: In beginning Inventory:		15,000	50,000
		125,000	346,000
Current Costs:			
		140,000	396,000
Cost per equivalent Unit:		Shs.140,000	Shs.396,000
		35,000	33,000

= Shs.4 Shs.12

Total Cost per equivalent Unit:
4 + 12 = Shs.16

FIFO

	Total Physical Units	Materials	Conversion
Beginning W.I.P	5,000		1,000 = (1/5 X 500)
Units started and completed during The current period = (2,900 – 5,000)	24,000	24,000	24,000
Ending W.I.P	6,000	6,000	4,000 = (2/3 x 6,000)
	35,000		
Equivalent Units		30,000	29,000

Current Costs:		125,000	346,000
Cost/ Equivalent Units		125,000	346,000
			29,000
		30,000	
Total Cost Per Equivalent Unit:	Shs,16.10	= Shs.4.20	Shs.11.90

* Equivalent Units of 5,000 x (1 – 4/5) = 1,000 units was the work done in the period to complete the beginning W.I.P.

Note that the previous period costs in the beginning W.I.P (Materials. shs.15,000 and converting – shs.50,000) have been excluded in *

6.4.3 PROCESS COST REPORT

This is a commonly used statement which traces the flow of units produced and costs incurred in the production process.

The report is prepared for each process and it provides a reconciliation of the physical flow of units and the total costs for the period . Assuming no spoilage or losses, the following relationships will always hold:

1. Physical Units:

   Beginning W.I.P + Units started during – Units to account for the period.

   = Units completed and transferred + Ending work in progress – Units accounted for.

2. Costs:

   Cost of Beginning W.I.P. + Current costs incurred – Costs to account for = Costs of units completed and transferred

Example

Assume that the beginning work in progress in Maendeleo Company Ltd in the month of November was 1,000 units which were 100% complete in terms of materials and 75% complete as to

conversion. Raw materials costs relating to beginning work in progress amounted to shs.3,000 and conversion was shs.1,000. 10,000 units were completed during the period and transferred to finished goods stock a/c. 2,000 units were still in process and were 100% complete in relation to materials and 50% complete in relation to conversion costs. Costs incurred during the period were raw materials shs.33,000, conversion shs.43,000;

Required

Use both weighted average and FIFO methods, to determine cost per equivalent unit and value of ending inventory. Prepare the process cost report.

MAENDELEO COMPANY LIMITED.

PROCESS COST REPORT

For the month of December

(Weighted Average Method)

1st Step **Physical Units**

Beginning W.I.P	1,000
Units started during the period	11,000 (10,000 + 2,000 – 1,000)
Units to account for:	12,000

2nd Step **Equivalent Units**

	Total Units	**Materials**	**Conversion Costs**
Units completed during the period:	10,000	10,000	10,000

Ending W.I.P	2,000	2,000 =(100% x 2,000)	1,000=(50% x 2,000)
Units accounted for	12,000	12,000	11,000

3rd Step **Cost Determination**

	Total Units	**Material Cost**	**Conversion Costs**
Beginning W.I.P	3,000	-	-
Materials:			
Conversion			
Current costs	1,000	-	-
Cost to account for:	76,000	33,000	43,000
	80,000		
		33,000	43,000
		11,000	10,250
	Shs.	Shs.3	Shs.4

7

4th Step: Cost Assignment:

Units started and completed during the current period: 9,000 x 7:			63,000
Ending W.I.P = Materials: 2,000 x 3:		6,000	
	=	4,000	10,000
Conversion: 1,000 x 4:			
Beginning W.I.P Materials		3,000	
		1,000	4,000
Conversion:			
Cost of work done to complete beginning W.I.P			
	✶ costs	750 x 4	3,000
Costs Accounted for			80,000

6.4.4 PROCESS LOSSES

a) Most manufacturing processes result in some portion of the raw materials used not being converted into

a reliable half hence losses. These losses may take the form of waste, scrap, rework, and spoilt units.

- **Waste:** are **materials lost** in the process, which are irrecoverable or have no recoverable value.
- **Scrap:** Material held after a productive process, which are irrecoverable or have no recoverable value.
- **Rework:** These are finished goods that do not meet quality standards but which with some additional work can be sold.
- **Loss:** Refers to finished or partially finished units, which cannot be reworked or used for their intended purpose. They may be discarded or sold for minimal value. There are two types of spoilage;

- **Normal Loss:** is loss expected and unavoidable even under the most efficient systems of production. Normal spoilage cost is normally included in product cost.
- **Abnormal Spoilage:** This is loss that is avoidable with efficient

operating conditions. The cost is regarded as controllable and can be eradicated if due diligence and supervision are exercised. The cost is normally treated as a loss and charged to profit and loss account.

b) Accounting Treatment of Spoilage Costs

1) **Normal Spoilage Costs:** These costs are assigned to the good output using two approaches:

(i) **Omission Approach**: Under this approach, the normally spoilt units are not included in the calculation of equivalent units. This means that the cost of the normally spoilt units will automatically be distributed to the good output. By excluding the normal spoilage in the computation to the good output, a lower figure will be derived. The weaknesses of this method are;

(a) The cost of normal spoilage is spread equally into the finished goods and the ending W.I.P

regardless of whether the ending W.I.P. has passed the inspection stage or not.

b) It does not allow the manager to see the costs of spoilage because these costs are not computed.

(ii) **Recognition and Re-Assignment Approach** In this approach, the normal spoilage is included in the equivalent units computation; further, the normally spoilt units will be assigned costs just like any other unit. The spoilage costs will then be reallocated to these good units that have passed the inspection point. The steps to follow under this method are:

(a) Compute equivalent units including normal spoilage.

(b) Assign costs to all units including normal spoilage.

(c) Reassign normal spoilage costs to good output.

2) Abnormal Spoilage Costs

These costs do not add any production benefit to the company and are treated as accounting losses. The costs are written off directly as losses for the period in which they occur.

Illustration

Mombasa Limited manufacturer a product through two departments. The following is the data in respect of department for the month of January:

Beginning W.I.P. (25% complete as to conversion):	10,000 units
Costs for beginning W.I.P:	
Transferred in	Shs.82,900
Conversion costs	Shs.42,000

Units started in the current period.			70,000 units
Current costs:	Transferred in	Shs.645,100	
	Conversion	Shs.612,500	
	Additional Materials*		
Units completed and transferred:			50,000 units
Units in ending W.I.P (95% complete as to conversion)			20,000 units
Spoilt Units			10,000 units

Additional Information

1. Normal spoilage is 10% of all good units that pass inspection
2. Inspection occurs when production is 80% complete.
3. Conversion costs are incurred evenly through-out the process.

Required

Prepare a process cost report using

(a) Weighted Average

(b) FIFO

Apply both the recognition re-assignment approach in dealing with the spoilage.

Solution

Mombasa Limited.

Process Cost Report (Dept 2)

Weighted Average Approach

Physical Units	Physical Units	Transferred In	Additional Materials	Conversion
Beginning W.I.P.	10,000			
Units	70,000			

started in Current Period				
Units to Account for	80,000			
Equivalent Units:				
Finished Goods:	50,000	50,000	50,000	50,00
Ending W.I.P	20,000	20,000	20,000	19,00
Normal Spoilage @ 10%				
(50,000 + 20,000):	7,000	7,000	-	5,600 (80%x7
Abnormal Spoilage:				
(10,000 – 3,000)	3,000	3,000	-	2,400 (80%x3
Equivalent Units	80,000	80,000	70,000	77,00

Cost Determination	Total Cost	Transferred In	Additional Materials	Conversion
Beginning W.I.P	124,900	82,900	-	4,200
Current Costs	1,908,600	645,100	651,000	612,500
Costs to Account for:	2,033,500	728,000	651,000	645,500
Divided by Equivalent Units		80,000	70,000	77,000
Cost per equivalent Unit	Shs.26.90	Shs.9.30	Shs.9.30	Shs.8.50

Cost Assignment	Transferred In Cost:	7,000 x 9.10 =	63,700	
Normal Spoilage	Added Material:	7,000 x - =	-	
	Conversion Costs:	5,600 x 8.50 =	47,600	
	Normal Spoilage costs recognized (and to be assigned)		111,300	
Finished Goods Costs	Excluding Normal Spoilage: 50,000 x 26.90	=		1,345,000
	Normal spoilage costs assigned: 50,000 x 111,300 = 70,000			79,500

				1,424,500
Ending W.I.P: Excluding Normal Spoilage:				
Transferred in costs	=	20,000 x 9.1	= 182,000	
Additional Material	=	20,000 x 9.3	= 186,000	
Conversion Costs	=	19,000 x 8.5	= 161,500	
Normal Spoilage costs =		20,000 x 111,300 / 70,000	= 31,800	561,300
Abnormal Spoilage:				
Transferred in costs	=	3,000 x 9.10	= 27,300	
Additional Material	=	=	-	
Conversion Costs	=	2,400 x 8.5 =	20,400	4

	7,700
Costs Accounted for	2,033,500

Mombasa Limited, Process Cost Report

Weighted Average Method (Omission Approval)

Physical Units:	**Total**	**Transferred In**	**Material**	**Conversion**
Beginning W.I.P	10,000			
Started and Transferred	70,000			
Units to account for	**80,000**			
Equivalent Units				
Finished Goods	50,000	50,000	50,000	50,000
Ending W.I.P	20,000	20,000	20,000	19,000
Normal Spoilage	7,000	-	-	-

Abnormal Spoilage	3,000	3,000	-	2,4
Units Accounted for	**80,000**	73,000	70,000	71,4

Cost Flow	**Total Costs**			
Beginning W.I.P.	124,900	82,900	-	42,0
Current costs	1,908,600	645,000	651,000	612,5
Cost to Account for:	2,033,500	728,000	651,000	651,5
Cost per equivalent unit	28.44	9.97	9.3	9.1

Cost Assignment:		
Finished Goods:	50,000x28.44	1,422,0

Ending W.I.P:		20,000 x 9.97 =	199,460	
Transferred in:				
	Materials:	20,000 x 9.30 =	186,000	
	Conversion:	19,000 x 9.167 =	174,173	559,663
Abnormal Spoilage:	Transferred in:	3,000 x 9.97 =	29,919	
	Conversion:	2,400 x 9.167 =	22,000	
				51,919
Total Costs Accounted for				**2,033,552**

SHRINKAGE

This refers to a loss or disappearance of material inputs used during the production process. It occurs mainly through the evaporation. This is unlike spoilage in which the units are still existing only that they will be of a lower value than the good units. Shrinking is common in chemical mixtures which produce or use liquid gases as material inputs. **The problem associated with shrinking is the reconciliation of the beginning and ending_inventory.** This problem is resolved by **expressing the various layers of production in terms of what its weights or volume would be either at the beginning or end of the process.**

Illustration

Assume that a chemical company, which is processing one of its products through one of its processes, must start with 100kg of a certain chemical for its 80kg of finished products. Assume that all the chemical is added at the beginning of the process and 20% of the evaporation takes place gradually through-out the process.

The actual weights through measurement were as follows:

Beginning W.I.P Inventory (75%complete)	21,250kg.
Units started	110,000kg.
Finished Goods Transferred	80,000kg.
Ending W.I.P (25%)	33,250kg.
<u>Costs:</u>	
Beginning W.I.P:	100,000
Current Conversion Costs:	252,000
Current Material Costs:	220,000

Prepare a cost report:

(i) Using the FIFO method

(ii) Using ending weight

(iii) Using beginning weights

For beginning W.I.P: actual weight – 21250kg (75% By 75%), only 20%x75%=15% evaporation will have incurred. Therefore beginning weight (without evaporation)

$= 21250 \times \frac{100}{85}$

= 25,000kg

Solution

Evaporation rate = 20%

75%x20% = 15%

21,250 –85% Therefore

$\frac{21,500}{85} X 100\% = 25,000 - 21,250 kg$

Thus evaporation should be 25,000kg (75%complete) at 20% evaporation. For ending W.I.P., we have 33,250kg actual weight (25% complete).

By 25% completion, 20% (25%) = 5% evaporation will have occurred. Therefore the ending

Weight without evaporation = $\frac{32,250}{95} X 100\% = 35,000 kg$

Thus evaporation should be: 35,00kg (25% complete) at 20% evaporation.

PROCESS COST REPORT

FIFO Method: Assuming Beginning weights

	Physical Units	**Materials**	**Conversion**
Beginning W.I.P.	25,000		
Units started	110,000		
Units to account for	135,000		
Beginning W.I.P	25,000	-	6,250(25%)
Units started & completed	75,000	75,000	75,000 done
Ending W.I.P	35,000	35,000	8,750(25% x35,000)

Cost	**Total**	**Materials**	**Conversio**

Statement	**Costs**	**Costs**	**n costs**
Beginning W.I.P	100,000	-	-
Current Costs	472,000	220,000	252,000
Costs to A/c for	572,000	220,000	252,000
Costs per unit	Shs.4.80	Shs.2	Shs.2.80

Cost Assignment				
Units started and completed:		(75,000x4.80) =		360,000
Ending work in process:		35,000 x 2 =	70,000	
Material:				
Conversion		(8,750 x 2) =	24,500	94,500
Beginning W.I.P:	Process Cost: b/f		100,000	

	Conversion	(6,250x 2.80) =	17,500	117,500
Costs Accounted for				572,000

Using the Ending Weights

	Start		End
Beginning W.I.P.	25,000kg	80%	20,000 kg
Units Started	110,000kg		88,000 kg
Finished goods	100,000kg		80,000 kg
Losing W.I.P			28,000 kg

	Physical Units	Materials	Conversion
Beginning W.I.P	20,000 (21,250 x 80%)		
	0.85		
Units Started:	88,000 (110,000x80%)		

	108,000		
Finished Goods:	80,000	80,000	80,000
Ending W.I.P.	28,000	28,000	7,000(25% x 28,000)
Units accounted for	108,000		
Less: Equiv Units of work		108,000	87,000
Done previously: 25%of beginning W.I.P.		(20,000)	(15,000) (75% x 20,000)
		88,000	72,000(60,000+7,000+5,000)

	Total Cost	Materials	Conversion
Beginning W.I.P.	100,000	-	-

Add Current Costs:	472,000	220,000	252,000
Costs to account for:	572,000	220,000	252,000
Equivalent Units			
		88,000	72,000
Cost/Equiv Units	Shs.6	Shs.2.50	Shs.3.50

6.4.5 ALLOCATION OF JOINT COSTS

When two or more products of relatively high value emerge simultaneously from a single process, they are called **joint products**. The process that gives rise to these products is called a joint process and the costs involved are referred to as joint product costs. Joint products are not separately identifiable as individual products until their split off point. Split-off point is the point at which joint products become separate entities or are individually identifiable.

Allocation of joint costs involves assigning the costs of the joint process to the products emerging at the split off point. Any costs beyond the split off point are referred to as **separable costs.**

Methods Used to Allocate Joint Costs

1) Physical/Unit Measure
2) Constant gross margin rate

3) Net realizable value.

1) Physical Measure/Unit

Joint costs are allocated to the joint products according to the ratio of physical measurement of the outputs at the split off point.

2) **Constant Gross Margin Rate**

This method assumes that each product contributes an equal percentage of gross profit for every shilling of sales. It works back from gross margin to the joint costs allocation. It involves the following steps:

(i) Calculate the overall rate of gross margin for al the products

(ii) Multiply the computed overall rate by the sales of every product to obtain the gross margin of the product.

(iii) Deduct the gross margin from the sales value of the product to determine the total costs for each product.

(iv) Deduct separable costs from the total costs to obtain joint costs allocated.

3) Net Realizable Value

Under this method, joint costs are allocated according to the net realizable*

Net Realizable Value = Ultimate Sales Value – Separable Costs.

Illustration

A company produces three products, Y1, Y2, and Y3 in the same process. The data below reflects average monthly results:

	Y1	Y2	Y3
Monthly output (kg)	40,000	20,000	20,000
Sales Value at split off (shs.)	0	30,000	105,000
Sales Value after Split off	45,000	100,000	155,000
Costs of further processing	20,000	40,000	65,000

The joint costs were Shs.100,000

Required

Allocate the joint cost using the three methods used to allocate joint costs.

Solution

(i) Physical/Measurement/Unit Method

	Y1	Y2	Y3	TOTAL
Physical Output: (Kg)	40,000	20,000	20,000	80,000
Proportion	50%	25%	25%	
Joint costs allocated	50,000	25,000	25,000	

(ii) Constant Gross Margin Rate Method

Total Sales Value after slit-off:	Y1 =	45,000	
	Y2 =	100,000	
	Y3 =	155,000	
			300,000
Less: Total Costs:			
Joint Costs:		100,000	
Further Processing Costs: Y1		20,000	
	Y2	40,000	
	Y3	65,000	(225,000)
			75,000

Costs Allocated To:	Y1	Y2	Y3	TOTAL
Sales Value:	45,000	100,000	155,000	
Less Gross Margin	(11,250)	(25,000)	(38,750)	
Total Costs	33,750	75,000	116,250	
Less Separate Costs	(20,000)	(40,000)	(65,000)	
Joint Costs Allocated :	13,750	35,000	51,250	100,000

(iii) Net Realizable Value/Method

Net Realizable Value = Ultimate Sales Value – Separable Costs

	Y1	Y2	Y3	TOT

				AL
Ultimate Sales Value:	45,000	100,000	155,000	
Less: Separable Costs	(20,000)	(40,000)	(65,000)	
Net Realizable Value:	25,000	60,000	90,000	175,000
Proportion on Net Realizable Value	14%	34%	52%	
Allocation of Joint Costs:	14,000	34,000	52,000	100,000

6.4.6 UNIFORM COSTING

This is a common system using agreed concepts, principles and standard accounting practices adopted by different entities in the same industry to ensure that they all deal with accounting information in a similar manner so as to facilitate inter-firm comparison.

The objectives of uniform costing are:

a. To promote uniformity of costing methods, so that valid costs comparisons can be made between similar organization

b. To eliminate inefficiencies and promote good practice revealed by the cost comparison.

c. Serve as a basis for government subsidies or grants which weed similar costing systems to ensure equitable distribution.

d. Serve as a basis for competitive bidding.

Requirements of Uniform Costing

Uniform costing systems should process the following features:

2. Cost statements and reports should be organized and laid out in a similar format so that each element of cost and revenue can be compared quite easily.
3. Accounting periods must be the same in all firms in the industry.
4. The methods of valuing stocks and work in progress must be the same.
5. The basis of valuing fixed assets must be the same.
6. The method and actual rates of depreciation for each type of asset must be the same.
7. The basis of cost or overhead apportionment and absorption must be similar.
8. Cost classification systems must be the same in all the firms in the industry so that similar items are classified in the same names.

Advantages of Uniform Costing

1. It enables costs to be compared easily
2. It makes it easier to computerize the accounting system of various organizations in the industry.
3. It leads to easier cost transferability between organizations.

Disadvantages

1. It may not be appropriate or suitable to an individual organization in the industry if there is a difference in size and structure.
2. It is slow to adopt to changing conditions and demands.

Other Costing Methods

a) Unit Costing
b) Service Costing

REINFORCING QUESTIONS

QUESTION ONE

AC Limited is a small company that undertakes a variety of jobs for its customers.

Budgeted Profit and Loss statement For the year ending 31st December 2003

	Shs	Shs
Sales		750,000
Costs:		
Direct materials	100,000	
Direct wages	50,000	
Prime cost	150,000	
Fixed production overhead	300,000	
Production cost	450,000	
Selling, distribution and Administration cost	160,000	610,000

Profit	Shs.140,000

Budgeted data:

Labour hours for the year	25,000
Machine hours for the year	15,000
Number of jobs for the year	300

An enquiry has been received and the production department has produced estimates of the prime cost involved and of the hours required to complete job A57.

	Shs
Direct materials	250
Direct wages	200
Prime cost	Shs.450

Labour hours required	80

Machine hours required	50

You are required to

a) Calculate by different methods six overhead absorption rates:
b) Comment briefly on the suitability of each method calculated in (a).
c) Calculate cost estimates for job A57 using in turn each six overhead absorption rates calculated in (a).

(Total:20 marks)

QUESTION TWO

Majengo Builders has been engaged to construct a building to serve as the head office for Ushirika Co-operative Society. Construction work commenced on 1 June 2004 and the following information was extracted from Majengo Builders accounting records on 30 November 2004.

	Shs

Control price	1,500,000
Payment for direct wages	240,000
Accrued wages, 30 November	10,000
Materials issued	275,000
Materials returned to store	2,500
Plant and equipment at cost on 1 June	150,000
Installation costs	125,000
Payment for direct expenses	75,000
Direct expenses accrued, 30 November	5,000
Value of plant and equipment 30 November	100,000
Materials on site, 30 November	27,500
Value of work not yet certified	800,000
Cost of work not yet certified	50,000
Cash received from	750,00

Ushirika Co-operative Society	0

Required

a) Prepare the Contract Account for the building for the six months to 30 November 2004, as it would appear in the records of Majengo Builders.

b) Determine the amount to be shown as work-in-progress in the records of Majengo Builders at 30 November 2004.

(Total: 20 marks)

QUESTION THREE

The following information relates to contract No.C74 being undertaken by Oceanic Construction Company for the year ended 30 September 1989.

	Shs '000'
Materials on hand at site 1 October 1988	900
Payment for direct wages	4,800
Accrued wages not yet paid 30 September 1989	400
Materials on hand at site 30 September 1989	2,600
Payment for direct expenses	6,400
Depreciation expenses on equipment at site	800
Cost of material purchased	37,650
Machinery installation and service costs	2,400
Accrued expenses not yet paid 30 September 1989	600
Detective materials returned to stores	350
Value of work certified	40,000
Cash received from contractee	38,000

Cost of work not yet certified	24,000
Estimated total contract cost	125,000
Contract price	180,000

The contract has been in progress since 1st October 1988.
It is estimated that the contract will be completed within 9 months from 30 September 1989.

Required

a) Prepare a Contract Account for the year ended 30 September 1989 as it would appear in the records of Oceanic Construction Company.
b) (Contract profit, if any, is to be credited in the ratio of work certified to work not certified)
c) Compute the value of work-in-progress at 30 September 1989

(Total: 20 Marks)

QUESTION FOUR

Deluxe Paints Limited manufactures a special industrial pain known as “DX3” which undergoes two processes before completion. The following information relates to production undertaken during October 1991.

Process	*1*	*2*
Input	20,000 litres @ Sh.50	?
Added costs (Sh. ‘000’)		
Material	460	368.5
Labour	386	304.5
Overhead	165	211.2
Normal loss	10% of input	5% of input
Scrap value	Sh.15 per litre	Sh.34 per litre

Output:

To process 2:	16,000 litres
To Finished Goods:	13,000 litres
To work in Progress c/f:	2,000 liters
Previous Process Costs	100%
Added material	80%
Labour	70%
Overhead	50%

There was no opening work-in-progress in either of the two processes. Losses in process 2 had the following degree of completion: previous process costs 100%, Added material 70%, Labour 50%, Overheads 40%.

Required

Draw a Process Accounts for both Processes for the month of October.

(Total:20 Marks)

QUESTION FIVE

Company XYZ Ltd. manufactures a product, which passes through three processes. Given below is data relating to the financial process in the month of November:

		Shs
Transfer from process 2	10,000 units	300,000
Materials		230,400
Labour		105,600
Overheads		50,400

The normal process loss is estimates at 2%. During the month of November 7,200 units were completed and transferred to finished goods. In addition, 2,000 units remained as work-in-progress whose degree of completion was 60% for materials, labour and overheads. The selling price of normal loss units its estimated at shs.30 per unit.

Required

a) Calculate the cost of completed units transferred to finished goods.

b) Calculate the value of work-in-progress at end of November.

c) Assuming that any units or normal or abnormal loss were sold at a price of SH.30 per unit, show the Abnormal Loss Account, as it would appear after the units are sold. Assume that abnormal loss units are complete in all respects.

(Total: 20 Marks)

CHECK YOUR ANSWERS WITH THOSE GIVEN IN LESSON 9 OF THE STUDY PACK

COMPREHENSIVE ASSINMENT No.3

To be carried out under examination conditions and sent to Distance Learning Administrator for marking by the University.

Attempt All Questions

Time Allowed: 3 Hours

QUESTION ONE

Tradewinds Company makes a chemical that passes through three production Processes, 1,2, and 3. in the month of October 5,000 litres of the basic raw material priced at sh.120,000 were introduced into process 1. subsequently, the following cost were incurred:

Process 1	
Direct labour	Shs.80,000
Direct expenses	Shs.30,000

At the end of the process 4,800 litres were passed onto process 2.

Process 2

Direct materials (additional)	Shs.66, 300
Direct labour	Shs.60, 000
Direct expenses	Shs.24, 000

At the end of the process, 4,700 litres were passed onto process 3

Process 3

Direct materials (additional)	Shs.25, 680
Direct labour	Shs.20, 000
Direct expenses	Shs. 4,800

At the end of the process, 4,680 litres were passed onto the finished goods store.

Normal process losses for each of the three process are:

Process 1 – 3%; Process 2 – 2.5%; Process 3 – Nil

The loss in each process resulted from evaporation due to heating or due to spillage and hence nothing of value could be realized from these losses. There were no stocks of materials or Work-in-Progress at the beginning or end of the month. The output of each process passes directly to the next process at cost without any provision for internal profit. Manufacturing overheads are absorbed by each process at 25% of direct labour cost.

Required

i. Prepare separate process accounts for each of the three processes. (18 marks)

ii. Prepare the abnormal loss and abnormal gain accounts. (4 marks)

(Total: 20 marks)

QUESTION TWO

The following information relates to the unit manufacturing costs of product Wye by the Marino Company.

		Shs
Selling price		
Cost of sales:		100
Variable costs	65	
Fixed costs	20	85
Gross profit		15
Selling and administrative costs		10
Net profit		5

The company budgets for fixed production costs o Sh.3,600,000 and selling and administrative costs of Sh.750,000 per annum. These costs are incurred evenly during the year. During the latest financial year, the following results were achieved:

	First 6 months	Second 6 months
Production (units)	75,000	60,000
Sales (units)	50,000	70,000

There were no opening stocks at the beginning of the year. Fixed production costs and selling and administrative costs incurred during the year were equal to the budget.

Required

Prepare trading, profit and loss statements for each of the two six month periods using each of the following methods:

a) Absorption Costing (12 marks)

b) Marginal Costing. (10 marks)

(Total: 22 marks)

QUESTION THREE

Karibu Fabricators Ltd. Uses a job costing system to price its custom-made products. Predetermined overhead rates are used to absorb overheads to each job. Each job passes through two departments – department 1 and department 2. In department 1, overheads are absorbed on basis of prime cost while in department 2, absorption is on the basis of machine hours. Management is in the process of setting overhead absorption rates for the next financial year and the following information is provided:

	Department 1	**Department 2**
Budgeted direct labour hours	25,000	5,000
Budgeted direct labour rate	Shs.30 per hour	Shs.12.50 per hour
Budgeted factory overheads	900,000	Shs.630,000
Budgeted direct material		

Usages (units)	60,000 Kg.	90,000 Kg.
Budgeted direct material		
Purchase price	Shs.25 per Kg.	Shs.7.50 per Kg
Budgeted machine hours	1,000	45,000

Required

Calculate overhead absorption rates for each department. (6 marks)

A customer has submitted a request for a price quotation on a job. This job specifications are as follows:

	Department 1	**Department 2**
Direct materials required	20	6
Direct labor hours required	5	2
Machine hours required	½	3

The company provides a mark-up of 50% on factory costs to cover general expenses and profits.

Calculate the price to be charged for this job. (8 marks)

By the end of the year, the following costs had been incurred:

	Department 1	**Department 2**
Direct materials	Shs.1,400,000	Shs.80,000
Direct labour	Shs.800,000	Shs.65,000
Factory overheads	Shs.875,000	Shs.625,000
Direct labour hours	26,000	5,500
Direct materials used (units)	67,500 Kg.	100,000 Kg.
Machine hours		

	500
1,500	50,000

Required

Calculate the amount of factory overhead over/under-applied for each department. (6 marks)

(Total: 20 marks)

Note

You are advised to note the relationship in parts (a), (b) and (c)

QUESTION FOUR

Nationwide Shoes Company Ltd. manufactures a sports shoe, which sells for shs.400 a pair. The company's operating budget for the current year envisages a sales volume of sh.1.6 million.

The following information relates to the costs associated with the company's production activities:

Direct material cost per unit amounts to shs.100 while direct labour cost per unit amounts to shs.80.
Factory overhead costs are budgeted at shs.1,500,000 per annum at the expected sales volume and out of this amount shs.900,000 is fixed.

Administrative, selling and distribution costs amount to shs.5,500,000 out of which shs.800,000 is variable.

A commission of 2.5% of the sales value is to be paid to local distributors. This amount is not included in the budget for selling and distribution costs.

Required

a) Calculate the breakeven level of activity in units and shillings. (8 marks)
b) What profit or loss will the company make at the budgeted sales level (7 marks)
c) What quantity should the company sell in

order to make a profit margin of 17.5% of sales

(7 marks)

(Total: 22 marks)

QUESTION FIVE

The following budget relates to the manufacture and sale of product Zed by the ABC Corporation for the financial year ended 31 May 2003:

BUDGETED PROFIT AND LOSS STATEMENT FOR YEAR ENDED 31 MAY 2003

	Shs '000's	Shs '000's
Sales		5,400
Production Costs		
Direct Materials	1,600	
Direct Labour	1,200	
Factory Overheads	1,520	4,320
		1,080
Operating Expenses		
Administrative expenses	400	
Selling and distribution	200	600
Net Profit		480

Additional Information

The company budgeted to produce and sell 20,000 units. However actual

production was 20,000 units with sales of only 15,000 units.
Factory overheads include shs.40,000 which is variable.
All administrative expenses are fixed. However, selling and distribution expenses include a unit packaging cost of shs.3 per unit while the rest is fixed.

Required

a) Draft the trading and profit and loss account of ABC Corporation for the year ended 31 May 2003 using both Absorption and Marginal costing approaches. Assume that unit variable costs and total fixed costs incurred during the year were equal to the budget. (16 marks)

b) Explain the difference between the profits calculated under both methods. Show computations. (6 marks)

(Total: 22 marks)

END OF COMPREHENSIVE ASSIGNMENT NO.3

NOW SEND YOUR ANSWERS TO THE DISTANCE LEARNING CENTRE FOR MARKING

LESSON SEVEN

BUDGETARY PLANNING AND CONTROL

OBJECTIVES

After you have studied this lesson you should be able to:

- Define budgets and explain the nature and purpose of budgets.
- Explain the Administration of budgets.
- Prepare the various types of budgets.
- Explain the behavioral aspects of budgeting.

CONTENTS

- Definitions
- Objectives of budgetary planning and control
- Preparation of budgets
- Flexible budgeting

INSTRUCTIONS

- Read the study Text
- Attempt the Reinforcing Questions.

INTRODUCTION

This lesson explores Budgetary, Planning and Control Techniques looking at the purpose, preparation, application and interpretation of budgets as well as their behavioural aspects

7.1 Nature and Purposes of Budgets

Budgeting refers to the process of quantifying the plans of an organization so as to enable it achieve its objectives in the defined period. The result of the process is budgets, which are used for cost control, performance evaluation and future decision making.

Budgetary Planning and Control may be seen a s short-term quantification and monitoring of long-term strategic plans of the organizations. Strategic planning involves preparation of strategic plans, which define the objectives to be pursued within the framework of corporate policy. It is by budgeting that a long-term corporate plan is put into action.

Budgets may be prepared for departments, functions or financial and

resource items. In fact, some people refer to budgeting as a means of coordinating the combined intelligence of the entire organization into a plan of action.

7.1.2 OBJECTIVES OF BUDGETARY PLANNING

1) Coordination

The budgetary process requires that visible detailed budgets are developed to cover each activity, department or function in the organization. This is only possible when the effort of one department's budget is related to the budget of another department. In this way, coordination of activities, function and department is achieved.

2) Communication

The full budgeting process involves liaison and discussion among all levels of management. Both vertical and horizontal communication is necessary to ensure proper coordination of activities.

3) Control

This is the process for comparing actual results with the budgeted results and reporting upon variances. Budgets set a control gauge, which assists to accomplish the plans set within agreed expenditure limits.

4) Motivation

Budgets may be seen as a bargaining process in which managers compete with each other for scarce resources. Budgets set targets, which have to be achieved. Where budgetary targets are tightly set, some individuals will be positively motivated towards achieving them.

5) Clarification of Responsibility and Authority

Budgetary process necessitates the organization of a business into responsibility and budget centres with clear lines of responsibilities of each

manager. This reduces duplication of efforts.

6) Planning

It is by Budgetary Planning that long-term plans are put into action. Planning involves determination of objectives to be attained at a future predetermined time. When monetary values are attached to plans they become budgets.

7.1.3 Limitations of Budgeting

- Too mush reliance may cause resistance (inflexibility) to change.
- Difficult to set levels of attainment. This may result into too tight budgets that cause loss of morale.
- Antagonism where budgets exert undue pressure.
- Budgeting control is a terminate exercise and therefore any report from

investigation of variances may b of little use to the current operations.

7.2 Organization of budgetary control

Budgetary control ideally involves the following steps:

1. The creation of budget centres.
2. The introduction of adequate accounting records.
3. The preparation of organization charts.

   This defines the functional responsibilities of each member of management.
4. The establishment of a budget committee:

   It will consist of operating and financial managers, who will be required to review,

   discuss and co-ordinate business activities. The main function of this **committee**_

   involves:

- To issue instructions regarding budget requirements, deadline dates for the receipt of budgets e.t.c.
- Draw up the budget preparation timetable. It takes the form of network analysis whereby some activities are preceded by some others.
- To define the general policies of management in relation to the budget.
- Checking initial draft and problems considered. Limiting factors are usually considered.
- Ensuring that the budgets are synchronized within the boundaries of available resources.
- To analyze comparison of budgets and actual results and to recommend corrective action where necessary.
- Review of budgets.
- Prepare the master budget after functional budgets have been prepared.
- The preparation of a budget manual. This is a document, which sets out the responsibilities of the persons

engaged in the routing of, and the forms and records required for budgeting control. Such manual will provide such information as:

- Description of the system and its objectives.
- Definition of the responsibilities and duties.
- Reports and statements required for each budget period.
- Deadline dates by which data are to be submitted.

7.3PREPARATION OF BUDGETS

THE MASTER BUDGET FRAMEWORK

The master budget is the overall quantifications of the budgeting plan. In it, functional budgets are incorporated. A functional budget is a budget if income and/or expenditure for a particular function. The master budget therefore combines all the budgets of the various departments in an organizations. It is useful in ensuring that all the individual budgets are consistent with one another and also presents a 'unit' picture of the entire organization.

It is made up of both production and non-production budgets.

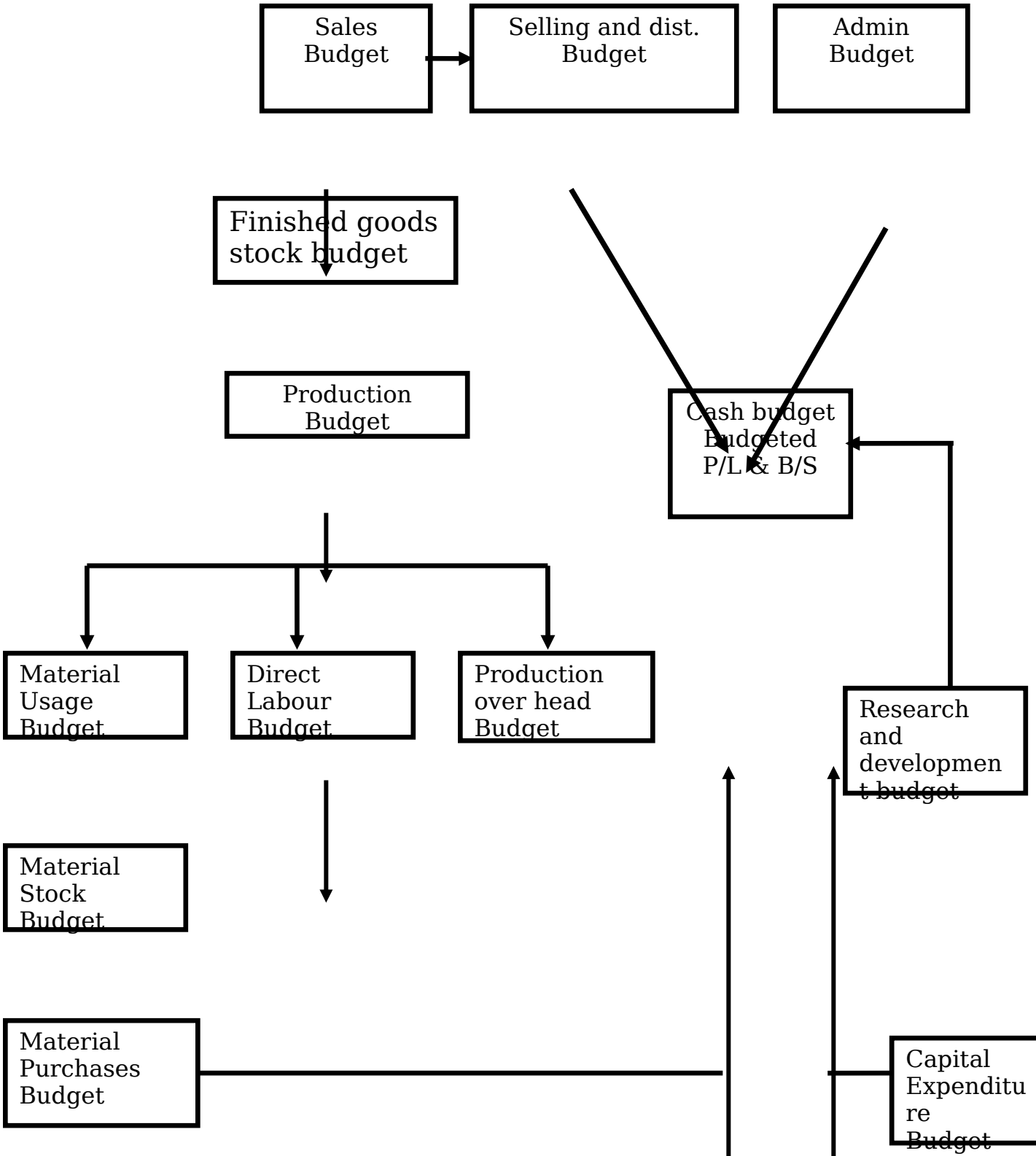
Production budgets
include:

- Sales Budget
- Finished Goods
  Budgets
- Material budges
- Labour budgets

- Overheads budgets.

Non-Production Budgets Include

- Selling & Distribution
- Administration Budget
- Cash Budget
- Research and Development – Capex
- All these budgets translate into the projected profit and loss a/c and the budgeted Balance Sheet.
- The relationship between all these budgets is summarized in the next page.


Sales Budget
Selling and dist. Budget
Admin Budget
Finished goods stock budget
Production Budget
Cash budget Budgeted P/L & B/S
Material Usage Budget
Direct Labour Budget
Production over head Budget
Research and development budget
Material Stock Budget
Material Purchases Budget
Capital Expenditure Budget





Sales budget

7.3.1 Sales Budget

It gives volume of sales and sales mix of the current operations. The sales forecast is initially prepared and upon completion the sales budget is finalized. The following are usually considered in coming up with the sales forecast.

- Actual sales in the previous periods.
- Reports from salesmen.
- Market research information.
- Level of orders already obtained in advance.

It essentially forecasts what the company can reasonably expect to sell to the customer during the budget period.

7.4.2 Production budget

It is the forecast of the products to be manufactured during the budget period to most forecasted sales above.

It is expressed as units of each type of product. The following are usually considered:

- Available production capacity.

- The sales forecast.
- Finished goods stock level policy.

The cycle for the preparation of the above budget usually is determined by the **budget committee. It is as follows:**

i. Determine the production capacity available.
ii. Consider the possible ways in which the available production capacity may be expanded if required.
iii. Linkage of production capacity available to the stock level.
iv. Determine the detailed budgets within the production budget.

Format

	6 (Units)	**P (Units)**	**J (Units)**
Required	xx	xx	xx
Stock 31/12/19-0			
Add: Sales	xx	xx	xx

during the year			
Less:	(xx)	(xx)	(xx)
Estimated Stock 01/01/19-0			
Production Requirements	xx	xx	xx

It has two purposes

- Ensures that production is sufficient to meet sales demand.
- Ensures that economic stock levels are maintained according to the stock policy.

7.4.3 Direct Materials Budget

This budget shows the estimated quantities and costs of all the raw materials and components needed for the output demand by the production budget. This consists of:

i. **Direct Materials Usage Budget:** Which shows the estimated quantities of materials required for budgeted production.
ii. **Direct Materials Purchases Budget:** It ensures that materials are within the planned materials stock levels i.e. after considering both usage material stock required.

7.4.4 Direct Labour Budget

It represents the forecasts of direct and indirect labour requirements to meet the demands of the company during the budget period.

The budgeted direct labour cost is therefore determined by multiplying direct labour hours with the wage rates for every category of labour.

7.4.5 Factory Overhead Budget

This budget represents the forecasts of all the production fixed and variable and semi-variable overheads to be incurred during the budget period.

The summation of budgeted costs of production for the budget period makes up **Production Cost Budget**. It includes:

- Budgeted Materials Cost
- Budgeted Labour Cost
- Budgeted Overhead Cost

7.4.6 Non-Production Budgets

a) Selling and Distribution Cost Budget

It is the forecast of all costs incurred in selling and distributing the company's product during the budget period. It is

closely concerned with the sales budget in that it is mainly based on the volume of sales projected for the period.

Expenses included are:

- Selling office costs
- Salesman salaries and commission
- Advertising expenses

b) Administration Costs Budget

It represents the costs of all administration expenses. Each department or budget centre will be responsible for the preparation of its own budget. Management, Secretarial, Accounting and Administration costs which cannot be directly related to the production are included here.

The budget will be mainly incremental i.e. previous year's figure will tend to apply for its next budget with an allowance for inflation.

c) Research and Development Cost Budget

These are costs, which are discretional in nature i.e. they are determined on need basis by the managers concerned. Research cost is the cost of original investigation undertaken in order to gain new scientific or technical knowledge and directed towards a specific practical aim objective.

Development cost is the cost of using scientific or technical knowledge in order to produce new or substantially improved materials, devices, products, processes systems or services prior to the commencement of commercial production.

d) Capital expenditure Budget

It represents the expenditure on all fixed assets during the budget period. Addition intended to benefit future accounting periods, or expenditure which increases the production capacity, efficiency lifespan or economy of an existing fixed assets are also incorporated.

e) Cash budget

It records the cash inflows and outflows, which are expected to take place in respect of each functional budget. It may be prepared for a period span of one week, month or quarter of the budget period. It has the following benefits/advantages:

- It ensures that sufficient cash is available when required.
- It shows whether capital expenditure projects can be financed internally.
- It indicates the cash needed for current operating activities.
- It indicates the effect the position of each seasonal requirements, large stocks, unusual receipts and laxity in collecting account receivable.
- It indicates the availability of cash for taking advantage of discounts.
- It reveals the availability of excess cash so that short-term investments may be considered.
- It serves as a basis for evaluating the actual cash management performance of responsible managers.

Illustration

Venus plc produces two products Niks and Args. The budget for the next year to 31st 20X8 is to be prepared. Expectations for the forthcoming year includes the following:

Venus PLC
BALANCE SHEET AS AT 1 APRIL 20X7

Fixed Assets			**Shs**
	Shs	**Shs**	
Land and buildings			45,000
Plant and Equipment (NBV)			112,000
Current Assets			
Raw materials		7,650	
Finished goods		23,615	
Debtors		19,500	
Cash		4,300	
		55,065	
Current Liabilities			
Creditors	6,800		

Taxation	24,500	(31,300)	23,765
			180,765
Financed by			
150,000 ordinary shares of Shs1 each			150,000
Retained profit			30,765
			180,765

(b) Finished Products_	**NIKS**	**ARGS**
The Sales Director has estimated the following:		
(i) Demand for the Co's products	4,500 units	4,000 units
(ii) Expected S.P per unit	Shs32	Shs44
(iii) Closing stock @ 31 March 20X8 is required to be	400 units	1200 units
(iv) Opening stocks at 01 April 20X7	900 units	200 units
(v) Unit cost of this	Shs2	Shs28

opening stock will be	0	
(vi) The amount of plant capacity required for each product is:	15min	24min
Machining		
Assembling	12min	18min
(vii) The raw material content per unit is	1.5 kg	0.5 kg
Material A		
Material B	2.0 kg	4.0 kg
(viii) Direct labour hours required @ unit of each product is:	6 hrs	9 hrs

Finished goods are valued at FIFO basis at full factory cost.

(c)	**Raw Materials**	**Material A**	**Material B**
(i)	Closing stock requirements kilos at 31 March 20X8	600	1000
(ii)	Opening stock at 1 April 20X7 kilos	1100	6000
(ii	Budgeted cost of raw	Shs1.5	Shs1.0

i) materials per kilo 0

Actual cost per kilo of opening stocks are as budgeted cost for the coming year.

(d) Direct Labour

The standard wage rate of direct labour is Shs1.50/hr.

(e) Factory overhead

Factory overhead is absorbed on the basis of machining hours with separate absorption rates for each department.

The following are expected overheads in the production cost centre budgets.

	Machinery Deport Shs	**Assembly Deport Shs**
Supervisors salaries	10,000	9,150
Power	2,400	2,000
Maintenance and running	2,100	2,000

costs		
Consumables	3,400	500
General Expenses	19,600	5,000
	39,500	18,650

Depreciation is taken at 5% straight-line on plant and machinery equipment. A machine costing the company Shs20,000 is due to be installed on 1 October 20X7 in the machining department which already has machinery installed to the value of Shs100,000 at cost.

(f)	**Selling and distribution expenses**	**Shs**
	Sales commission and salaries	14,300
	Traveling distribution	3,500
	Office salaries	10,100
	General administration expenses	2,500

30,400

(g) There is no opening or closing work in progress and inflation should be ignored.

Required

Prepare the following budgets for the year ended 31 March 20X8 for Venus PLC.

i) Sales budget
ii) Production budget (units)
iii) Plant utilization budget
iv) Direct materials utilization budget
v) Direct labour budget
vi) Factory overhead budget
vii) Direct materials purchases budget
viii) Cost of goods sold budget
ix) Budgeted profit and loss account

Solutions

Venus PLC

(i)
Sales Budget

	Qty (units)	Revenue (Shs)
NIKS	4,500	144,000[*1]
ARGS	4,000	176,000[*2]
TOTALS		320,000

(ii)
Production Budget (units)

	NIKS (units)	**ARGS (units)**
Sales	4,500	4,000
Add: Closing	400	1,200

Stock		
Total requirements	4,900	5,200
Less: Opening stock	(900)	(200)
Production budget	4,000	5,000

(iii)
Plant Utilization Budget

	Machinery	Assembling
NIKS (4,000 units) *3	1000 hrs	800 hrs
ARGS (5000 units) *4	2000	1,500
TOTAL PLANT UTILIZATION	3,000 hrs	2,300 hrs

*3 = 4000 x $\frac{15min}{60min}$; 4000 x $\frac{12min}{60min}$

*4 = 5000 x $\frac{24min}{60min}$; 5000 x $\frac{18min}{60min}$

(iv) Direct Material Uses Budget

	Units	**@**	**Material A**	**@**	**Material B**
NIKS	4,000	1.5	6,000	2.0	8,000
ARGS	5,000	0.5	2,500	4.0	20,000
Total Direct Materials USAGE	**8,500 kg**				**28,000 kg**

(v) Direct Materials Purchases Budget

	Mat A (kg)	Mat B (kg)
Current usage	8,500	28,000
Add: Closing stock	600	1,000
Total Req	9,100	29,000
Less: Opening stock	(1,100)	(6,000)
Material To Be Purchased (Kg)	8,000	23,000
Cost per Kg.	Shs1.5	Shs1.0
Material purchase Budget Shs	12,000	23,000

Total Material Purchases Budget: Shs.

12,000
+ 23,000
35,000

(vi) Direct Labour Budget

	Hrs
NIKS 4000 x 6	24,000
ARGS 5000 X 9	45,000
Direct Labour hrs	69,000
Standard Wage rate/hr	Shs 1.6
Direct Labour Cost Budget	Shs 110,400

Factory Overhead Budget		
	Machining Department (Shs)	**Assembly department (Shs)**
Budgeted Overheads ex	39,500	18,650

Cluding depreciation		
Add: Depreciation		
Less: Existing plant	*5 5,000	4,350
New plant	*6 500	-
Total budgeted overheads	45,000	23,000
Absorption Base (Machine hrs)	3,000	2,300
Overhead Absorption Rate	*7 Shs1.5/mach hr	Shs 10 mach hr

*5 = 100,000 x 5%; 87,000 x 5%

*6 = 20,000 x 5% x $\frac{6}{12}$

*7 = $\frac{4500(}{3000}$; $\frac{2300(}{2300}$

(viii) Cost of goods sold budget

	Niks (Shs)	Args (Shs)
Opening stock (WI)	18,000	5,600
Add:	78,400	140,750
Production (WII)		
Less:	7,840	33,780
Closing stock (WIII)		
Cost of goods sold	88,560	112,570

Workings

I: Opening stocks

Niks: 900 x 20 = 18,000
Args: 200 x 28 = 5,600

II PRODUCTION COST PER UNIT OF FINISHED PRODUCT

	NIKS	ARG

Materials: A 1.5 x 1.5	2.25	0.5 x 1.5	0.75
B 2.0 x 1.0	2.0	4.0 x 1.0	4.0
Labour: 6hrs x 1.6	9.6	9 hrs x 1.6	14.4
Overheads			
Machining 15 x $\frac{15}{60}$	3.75	15 x $\frac{24}{60}$	6.0
Assembly 10 x $\frac{12}{60}$	2.0	10 x $\frac{18}{60}$	3.0
Total production @ unit	Shs19.6		28.15
Production Units	4 000		50 00
Valuation	784 00		140 750

III CLOSING stock valuation

NIKS	ARGS

Closing stock units	400	1200
Unit cost	19.6	28.15
Stock units	7840	33780

(iv) BUDGETED PROFIT AND LOSS ACCOUNT

	NIKS (Shs)	ARGS (Shs)	TOTAL (Shs)
Sales	144000	176000	320000
Cost of goods sold	88560	112570	201130
Gross Profit	55440	63430	118870
Less: Selling and administrations expenses			30400
Net Profit			88470

KASNEB JUNE 1996

QUESTION FIVE

The following information related to the proposed budget for K.K Ltd for the months ending 31 December 1996.

Month	Sales	Material Purchases	Material Wages	Production Overheads	Administration Overheads
	Sh. '000'	Sh. '000'	Sh. '000'	Sh. '000'	Sh. '000
July	72000	250000	10000	6000	5500
August	97000	31000	12100	6300	670
September	86000	25500	10600	6000	750
October	88600	30600	25000	6500	890
November	102500	37000	22000	8000	1100
December	108700	38800	23000	18200	1150

Additional Information

1. Depreciation expenses are expected to be 0.5%of sales.
2. Expected cash balance in hand on 1 July 1996 is Sh. 72,500,000
3. 50% of total sales are cash sales

4. Assets are to be acquired in the months of August and October at Shs. 8,000,000 and Shs. 25,000,000 respectively
5. An application has been made to the bank for the grant of a loan of Shs. 30,000,00 and it is hoped that it will be received in the month of November
6. It is anticipated that a dividend of Shs. 35,000,000 will be paid in December
7. Debtors are allowed one month's credit
8. Sales commission at 3% on sales is paid to the salesmen each month

Required

A cash budget for the six months ending 31 December 2003.

CASH BUDGET

SUGGESTED SOLUTION: KASNEB JUNE 1996 QUESTION 5

K.K LTD

Workings I: Depreciation = 0.5% of sales

	July	Aug	Sept	Oct	Nov	Dec
Sales	720 00 00	970 00 00	860 00 00	886 00 00	1025 00 00	1087 00 00
Depreciation	360	485	430	443	512.5	543.5

II Cash Production Overheads

	July	Aug	Sept	Oct	Nov	Dec
Production overheads	600 0	630 0	600 0	650 0	8000	8200
Less:	36 0	48 5	43 0	44 3	51 2.5	54 3.5
Depreciation Cash production overheads	564 0	581 5	557 0	605 7	7487 .5	7656 .5

III Receipt from sales

	July	Aug	Sept	Oct	Nov	Dec
Total sales	72000	97000	86000	88600	102500	108700
Cash Sales (50%)	36000	48500	43000	44300	51250	54350
Receipt from Debtors	-	36000	48500	43000	44300	51250
Total cash receipts	36000	84500	91500	87500	95550	105600

IV Sales Commission (3% of Sales)

	July	Aug	Sept	Oct	Nov	Dec
Sales	72000	97000	86000	88600	102500	108700
Sales Commission	2160	2910	2580	2658	3075	3261

KK

CASH BUDGET FOR SIX MONTHS ENDING 31 DECEMBER 1996

RECEIPTS	July ‘000’	Aug ‘000’	Sept ‘000’	Oct ‘000’	Nov ‘000’	Dec ‘000’
Opening b/d	72500	96340	121690	156495	152567	207485
Cash receipts	36000	84500	91500	87500	95550	105600
Loan	-	-	-	-	30000	-
	108500	180840	213190	243995	278117	313085
PAYMENTS						
Materials	-	25000	31000	25500	30600	37000
Wages	10000	12100	10600	25000	22000	23000
RECEIPTS	**July ‘000’**	**Aug ‘000’**	**Sept ‘000’**	**Oct ‘000’**	**Nov ‘000’**	**Dec ‘000’**
Pdtn	-	5640	5815	5570	6057	7487.5

overheads						
Admin overheads	-	5500	6700	7500	8900	110
Cash assets	-	8000	-	2500 0	-	
Dividends	-	-	-	-	3500 0	
Sales commission	2 160	2910	2580	2658	3075	32
Total payments	121 60	591 60	566 95	912 78	703 62	
Closing balance c/d	963 40	1216 90	1564 95	1525 67	2074 85	196 6

7.4.7 FIXED AND FLEXIBLE BUDGETING

The master budget discussed before is a fixed budget.

A fixed budget is defined by:

- Only one level of activity

- Not adjusted to reflect actual activity level when change occurs

A fixed budget has the following limitations:

- It provides little assistance at the planning stage. It does not give implication of various alternative strategies which management may wish to consider.
- It fails to provide relevant and reliable base against which to measure actual performance where actual activity differs from the budget.
- Little motivation to management to use the budgeting control system as a control aid.

Flexible budget is a budget which is designed to change in accordance with the level of activity attained. It involves budgeting at various levels in anticipation of changes. The original budget is adjusted (flexed) to reflect the actual conditions in which the performance was done.

It is more useful than fixed budgeting due to:

- It provides a range of information at the planning stage which will assist in short term planning.
- **Control:** It provides control data when compared with actual performance.
- **Motivation:** More likely to be acceptable to management to provide a positive motivational stimulus because the control data is adjusted to conform with current activity level.

CHOICE OF BUDGET FLEXING BASIS

The most appropriate flexing basis should be considered in that it assists in the comparison of alternative budget data at the planning stage and for the comparison of budget and actual data at the control stage.
Different organizations use different flexing bases but the following are most commonly used.

- Machine hours
- Direct labour hours
- Input to a cost centre
- Output from a cost centre

For the above flexing bases to be used a number of requirements must be fulfilled.

1. The flexing bases should be correlated with the way in which costs vary. E.g. does the number of miles traveled by distribution vehicles affect the repairs and maintenance expenses?
2. The flexible bases should be easily understood by the management and not subject to manipulation.
3. The flexible bases should be readily obtainable.
4. It should be independent of other factors.

Illustration

Mini Bakeries Ltd. has budgeted to produce and sell 100,000 units of cakes during the next period. The selling price per cake is Sh. 20 and variable cost per

cake is Sh. 12. Fixed overheads are budgeted to at Sh. 6000,000.

Additional information

1. Fixed costs will increase to Sh. 700,000 where activity is in excess of 110,000 units; Fixed costs will fall to Sh. 480,000 where activity level is less than 90,000 units.
2. Variable costs will fall by 5% per unit (cake) of all units where activity is in excess of 100,000 cakes because of the economies of scale.

The actual results of the period in which 115,000 units (cakes0 were produced and sold were:

1. Sales revenue Sh. 2,242,500
2. Variable costs Sh. 1,320,000
3. Fixed costs Sh. 67,000

Required

1. Prepare a summary, which shows the budgeted results for activity levels from

80,000 to 120,000 cakes using the above information.

2. Prepare a control statement comparing budgeted with actual results where a fixed budget system is used based on 100,000 units.

Solution

Flexible Budget Summary

Units	**80,000**	**90,000**	**100,000**	**110,000**	**1,0**
Sales Revenue	1,600,000	1,800,000	2,000,000	2,200,000	2,4
Variable cost	690,000	108,000	120,000	1,254,000	1,3
Contribution	640,000	720,000	800,000	946,000	1,0
Fixed Costs	480,000	600,000	600,0	600,000	700
Net Profit	160,000	120,0	200,000	346,000	332

Control Statement (Fixed Budget)

	Budget	**Actual**	**Variance**
Units	100,000	115,00	15,000 (F)
Sales Revenue	2,000,000	2,242,500	242,500 (A)
Variable Cost	1,200,000	1,320,000	120,000 F

Contribution	800,000	922,500	122,500 (A)
Fixed Costs	600,000	670,000	70,000 (A)
Net Profit	200,000	252,500	525,000 (F)

7.4.8 ZERO BASED BUDGETING

It is also referred to as priority based budgeting. It is a cost benefit approach budgeting where it is assumed that the cost allowance is Zero for any item until the manager responsible justifies its existence in terms of costs and benefits.

CIMA definition: A method of budgeting whereby all activities are re-evaluated each time the budget is set. It is concerned with alternative means that established activities have been compared with alternative uses of the same resources.

It takes away the implied right of existing activities to continue receiving resources

unless they can be shown to be the best use of such resources.

Stages of Implementation

1. Definition of decision package.
   This is the comprehensive description of the organizations functions or activities.
2. Evaluation and ranking of packages.
   This is on benefit basis.
3. Resource allocation according to priorities.

Advantages

1. More efficient allocation of resources.
2. Focus attention on values for money and makes clear relationship between input and output.
3. Develops a questioning altitude and makes it easier to identify obsolete, inefficient and less cost effective operations.
4. Leads to greater staff and management knowledge of operations.

Disadvantages

1. Time consuming.
2. High skills required.
3. May encourage wrong impression that all decisions must be made through budgets.
4. Short – term benefits may be emphasized to the detriment of long-term benefits.

REINFORCING QUESTIONS

QUESTION ONE

From the following statements, prepare a month-by-month cash budget for the six months to 31 December.

(a) Revenue budget (i.e. trading profit and loss account).

Six months to 31 Dec (all revenue/costs accrue evenly over the six months.

	Shs '000'	**Shs '000'**
Sales (Cash received/month in arrears)		1,200
Cost of sales:		
Paid one month in arrears	900	
Paid in one month of purchase	144	
Depreciation	72	1116
Budgeted profit	.	84

(b) Capital Budget Shs

	‘000’
Payments for new plant	
July	12
August	25
September	13
November	50
	100
Increase in stocks payable in August	20
	120
Receipts – New issue of Share Capital (October)	30

	Shs ‘000’	**Shs ‘000’**
(c) Balance sheet	**Actual/July Shs ‘000’**	
Assets Fixed Assets		720
Stocks		100
Debtors		210
Cash		40
		1070
Liabilities		
Capital and reserve		856

Taxation (payable December)	30
Creditors – Trade	160
Dividends (Payable August)	24
	1070

QUESTION TWO

S. Ltd Manufactures three products A. C and E in two production departments F and 6 each of which employs to grades of labour. The following data are available

	Total	A (Units)	C (Units)	E (Units)
Finished stocks Budgeted stocks are as follows.				
1 January, Year 2		720	540	1800
31 December, Year 2		600	570	1000
All stocks are valued at expected cost @ unit		Shs24	Shs15	Shs20
Expected Profit Calculated as % of S.P		20%	25%	$16\frac{2}{3}$%
	Shs '000"	**Shs '000"**	**Shs '000"**	**Shs '000"**
Budgeted sales	6600	1200	1800	3600
South				
Midlands	5100	1500	1200	2400

North	6380	1500	800	4080
	18080	4200	3800	10080
Normal loss in production		10%	20%	5%

Expected labour times per unit and expected rates/hr.

	Rate Shs	**Hrs/ Unit**	**Hrs/ Unit**	**Hrs/ Unit**
Department F	1.80	1.0	1.50	0.50
Grade 1	1.60	1.25	1.00	0.75
Grade 2 Department 6	2.0	1.50	0.50	0.50
Grade 1	2.00	1.50	0.50	0.50

Grade 2	1.8 0	1.00	0.75	1.75

Prepare the production budget is units for products A, C and E.
Prepare the direct wages budget wages budget for department F and with the labour costs of products A, C and E and totals shown separately.

QUESTION THREE

a) Give sound reasons why it is necessary for a business concern to prepare budgets.

b) A whole selling company had the following data for the month of November 1997.

Stocks	1 November 1997	1300 units
Cash balance	1 November 1997	Sh 700,000
Expected credit sales		4,860,000
Expected cash receipts		1,960,000
Minimum cash balance	30 Nov 1997	Sh. 100,000
Stocks balance	30 Nov 1997	1700 units
Expected sales		10,000 units

Expected collection from customers	Sh. 47,000,000
Expected cash disbursement	Sh. 1,740,000

Required:

i. Budgeted purchases
ii. Budgeted debtors
iii. Cash budgets

QUESTION FOUR

Stop over industries ltd, a recently incorporated company plans to go into production next year. The following standard cost matrix has been assembled for one of the products it proposes to manufacture.

Cost per unit

	Shs.	Shs.
Direct materials		18.00
Direct labour		10.00
Variable factory overhead		8.00
Salaries	6.00	
Rent	5.00	
Depreciation	3.00	4.00
Total standard		50.00

cost

The following recent information is available.

1. The company anticipates to manufacture and sell 198,00 units in the 2000 financial year.
2. Sales in the second and fourth quarters of the year are expected to be twice those of the first and third quarters.
3. Direct materials are ordered and paid for a month in advance.
4. 20% of the company sales are in cash. 60% of the credit sales are collected in the month following the month of sale and the balance the following month.
5. Expenses are settled in arrears at month end.
6. Overdraft facilities have been agreed at 30% p.q and the company's bank balance at 31 December 19x9 is expected to be Sh. 50,000.
7. The product is expected to retail at Sh. 80@ unit.

Required

1. Budgeted profit and loss for the first quarter.
2. Sales collection and schedule for the months of January, February and March 2000.
3. Cash flow for the months of January, February and March 1999.

QUESTION FIVE

Budgets are plans expressed in financial and/or quantitative terms for a specified period of time in the future in setting up a budgetary control system.

a) Describe what is the principal budget factor.
b) Essentials of effective budgetary control system

CHECK YOUR ANSWERS WITH THOSE GIVEN IN LESSON 9 OF THE STUDY PACK.

LESSON EIGHT

STANDARD COSTING

OBJECTIVES:

At the end of the chapter on standard costing, the learner should be able to:

- Describe the various types of standards.
- Apply the knowledge gained to calculate standard costs of materials, labour and overheads.
- Use standard costs to prepare budgets.
- Calculate material, labour and overhead variances of actual cots incurred from the standard costs.
- Explain the causes of those variances
- Keep appropriate cost accounting books of accounts.
- Understand the_benefits_and limitations of standard costing.

CONTENTS

- Standard Costing
- Types of Standard Costs
- Standards and Budgets
- Standard Cost Card
- Behavioral Aspects of Standards

INSTRUCTIONS

- Read the study text
- Do the Reinforcement Questions
- Do the Comprehensive assignments

8 INTRODUCTION

This lesson describes how a standard cost is arrived at and the various types of standard costs and the application of standard costing in budgeting.

The critical part of the chapter is variance analysis, the real life application of standard costing in budgeting and cost control. The behavioural implications of standard costs emanating from there from are also briefly outlined.

TUTORIAL NOTE

It is especially critical that you establish a **link between standard costs and budgets.** At this point, you need to put in your mind that standard costs one the “building blocks and cement” used to “build” a budget. There are other ways of establishing a budget other than using the standard costs, but the use of standard costs makes budgeting very easy and realistic!

8.1 Standard Costing And Standard Cost Defined

To effectively control the costs of a certain organization, we need a yard stick to measure the actual performance against. Traditionally, most organizations are known to use the previous period costs as the yardstick. But due to the fast changing business environment of the world businesses operate in today, managers always find that the previous period's performance is not an appropriate yard stick to measure the next and future periods' performance against. This is why most organizations develop standard costs.

Standard cost is therefore a yardstick that measures how well the organization has achieved its set objectives. This simple definition standard cost shows that a standard cost is developed simply for **performance evaluation** and **cost control**

purposes. A standard cost has therefore to be developed in advance before the actual performance to be measured begins; for this reason, a standard cost is a predetermined costs based on certain assumptions, the reader has to appreciate the fact that a standard costs is a mere **estimate** of **expected** costs under **certain conditions.**

From the above discussion, a standard costs clearly comes out as a cost set before the actual cots are actually incurred. Some scholars therefore refer to it as the **" cost level that should be" under attainable, acceptable performance____conditions.** Others refer to standard costs as carefully predetermined costs of production used as a basis for measurement and comparison.

Standard costs establish the **minimum desirable costs**
When actual costs incurred exceed or are below the standard costs, we then investigate the variances with an objective to take appropriate corrective measures.

Standard costing, on the other hand, is defined as the process of **establishing** predetermined estimates of the costs of products and services and **comparing**_this with the actual cost when they are incurred. Thus, it is an exercise that determines the expected cost levels under certain conditions (standard costs), then applies the standard costs to the actual performance (performance analysis) so as to determine the difference (variance). This difference can be good (favourable) or bad (unfavourable) depending on whether it is more or less than the standard; it is the basis of taking corrective action. (Control).

The variance needs to be further analyzed to determine how it came about. This is referred to as **variance analysis** and it is important because it **pinpoints** the exact causes of favourable (F) or unfavourable (U) deviation. Such causes can be corrected so as to achieve the desired performance.

Process of Setting Standards

Establishing correct a standard is very important because of the accuracy of the standards usually determines the success of the standard cost system. As we will see later, the standard cost system has very serious behavioral implications for the staff whose performance will be measured against the standards. It the staff feels that the standards are too high, (unachievable), they will be frustrated and will be greatly demotivated.

Also if a disciplinary action is taken on an employee who fails to achieve the standards, but the employee feel that it is unfair as the standard was inaccurate, this will bring about resentment, sabotage and demotivation to the employees. On the other hand, if the standards are too low, they will be easily achieved by employees and they will not be challenged to work hard.

In determining standard cost, each cost should be carefully analyzed to ensure all

factors affecting the cost level (in the period the cots are to be used) have been considered. In addition, managers in charge of the departments responsible for meeting the standards should approve the bases for the standards.

For the standard setting process and standards implementation to be successful, the employees responsible for meeting the standards should have the opportunity to participate in the **Standard Setting Process.** They are the best positioned in pinpointing inaccuracies in the set standards. It is easier to enforce standards once their acceptance is solicitated through participation in the setting process.

The manager overseeing the setting of standards should also have an honest desire to set achievable targets, and also to assist their lower managers and employees achieve them.

Also, standards should only be set after there has been interaction between all the individuals involved.

Last, and very important, the top management must fully support the standard costing process from Standards Setting to **standards implementation**. This support gives the standards the enforcement they need to be effected in the **whole organization.**

Recap

A standard cost is a predetermined calculation of how much is expected to be incurred under certain specified working conditions.
It is not an average of past costs since these may contain mistakes of past inefficiencies and may not incorporate changes in the business's operating environment e.g. technological changes.

Standard costs are developed from a scientific study of the various production cost

elements involved in producing a certain god or service. (These are usually specified in a product's technical specifications). To develop these costs, one needs to have a good idea or reliable estimate of the materials, labour and other cost levels that will apply during a specified period.

Standard costs give a basis of cost control through variance analysis. It is one of the leases**. It is also the basis of_budgeting.** Standard costs are also applied in **setting prices, valuing closing stocks and performance evaluation.**

8.2Types of Standard Costs

The standard cost set could be **basic, ideal, attainable or current.**

i. **Basic Standards** These are long term standards that would remain unchanged over the years. This sole use is to show trends over time for such items as material prices, labour rates, efficiency etc. They

therefore cannot be used to highlight current efficiency or inefficiency; for this reason, basic standards do not normally form part of the reporting system and will therefore be used as a background for statistical analysis over time.

ii. **Ideal Standards** These are standards, which can be achieved under the most favourable conditions. They are therefore based on the best possible operating conditions. They do not therefore make allowances for normal production problems such as material spoilage, stoppages, idle time, machine breakdowns, shrinkage etc.

They can be revised periodically to reflect changes in the organizations operating conditions. E.g. changes in technology.

However, since the ideal standards assume perfect operating conditions, they would be unattainable in real life, which has normal operating problems. Such as idle time and

machine breakdown, idle time and employee slowdown due to fatigue.

But the standard must be set high enough such that although achievable, it has to be worked for. Attainable standards should provide a challenge to employees by giving them a tough but realistic target: thus it motivates employees and management to achieve high levels of output.

i. **Attainable standards** Are used for product costing and pricing for stock valuation, for budgeting and for cost control and performance evaluation.

   But to be meaningful, attainable standards need to be revised regularly so as to affect the conditions expected to prevail during the period in which the standards would be applied.

   Of all the standards attainable standards are likely to produce the highest level of

motivation especially when the employees are adequately involved in setting them.

ii. **Current Standards** These are standards set for use over a short period of time, related to current.

Since basic standards cannot be used for analyzing current efficiency levels, a current periods standard can be developed for the basic standards. The current period standard can then be used to analyze the current period performance.

Current standards are useful especially in inflationary conditions where current standards could be set for a 3 month period or on a monthly basis to reflect the changes in prices.

Tutorial Note

1) The type of standard used (basic, ideal, attainable, current) directly affects the level of the variances which can arise, and the

meaning, which can be attached to the variances. For example, negative (unfavourable) variance will be taken more seriously if it is registered using a current and attainable standard than when it is registered using basic or ideal standards.

2) Standards for the same cost can vary from organization to organization depending on the level of efficiency desired by the management. Thus, standards are very subjective. What is also a matter of management opinion.

3) The accuracy of the standards set depends on the accuracy of the forecasting prices, activity level, wage etc of the **tam** setting such standards. If the team is good in forecasting skills, then the standards set are likely to be error free and **vice versa.**

8.3 Standards and Budgets: The Close Relationship

Budgets, as you recall from the previous chapter, are simply plans for expected future performance expressed in quantified monetary terms. They are therefore similar

to standards that both set performance and cost levels for control purposes. One would then conclude that budgets and standards are similar in principle although they differ in scope. This difference is explained in the following two points:

- **Standards are a unit concept** They apply to particular products, individual processes or single operations.
- **Budgets are concerned with totals** They lay the cost limits for functions and departments and for the firm as a whole.

What comes out clearly from the above is that standard cots are the “building blocks and cement” used to “build up” a structure referred to as a budget. This is because a budget is the um of the individual output units costs multiplied by the total output units desired, for example,

Budgeted Material Costs = Standard Material Cost x Number of output units.

Per Unit of Output desired.

For a company with many products, a periodic budget would be developed as follows:
Suppose a firm Gate Limited has 3 products X001, X002 and X003 with standard material costs of Shs.3.5, 7.25 and 1.50 respectively. The management intends to produce 5000 units, 1500 units and 2500 units of the three products respectively in the following period so as to achieve its target profits for the next period.

Required

Prepare the material cost budget for the company.

Solution

	Standard Material cost (Shs)	**Planned Output**	**Total Material Cost** (shs)
Product X001	3.50	5000	17,500
Product	7.25	1500	

X002			10,875
Product	1.50	2500	___
X003			3,750
		Total Material	275,00
		Cost Budget:	0

Another difference between budgets and standards in that budgets are revised regularly, usually on a quarterly, annually or monthly basis. Standards are only revised when they are inappropriate for use in the current operating conditions.

Finally, standard costs and the variances resulting from their analysis form part of the **accounting double entry system,** from which the final financial statements are prepared. On the other hand, budgets are simply memorandum figures and do not form part of the accounting double entry system.

8.3The Standard Cost Card

This is a card record of the Standard or expected costs In producing a given output. It gives the physical quantities of inputs as

well as their monetary values. It also gives the quality required. E.g. Grade A labour.

The process of setting standards results in the establishment of the standard cost for the product. The make-up of the standard cost is recorded on a standard cost card. For example, a standard cost card in Gate Limited's X004 product would look as follows; Assuming the following product details:

- The product passes through department A, B, and C
- It consume the following 2 types of direct materials:

P10: 2.5 kg each @ Shs.14.8: it is applied in department A

A53: 1000 units @ shs.3.75 per 100 units: It is applied in department B.

- X004 also used direct labour as follows:

Grade M: 4.8 hours @ Shs.2.5/hr in Department A
Grade N: 9.2 hours @ Shs.2.5/hr in Department B.
Grade O: (Assembly time) : 16.4 hours @ Shs.1.75/hr in Department C.

- Production overheads are applied as follows:
  Machine overheads: based on direct labour hours. The are incurred as shs.11/hr in departments A and B.

Indirect labour: based on direct labour hours in Department C above at shs.6/hr.

Required

Prepare a standard cost card for product X004.

Solution

GATE LIMIETED. Standard Cost Card For Product X004				Revised: 31.12.2004 By: Aron	
Cost Type and Quantity	Standard Rate (shs)	Department A (shs)	Department B (shs)	Department C (shs)	Total (shs)
Direct Material					
2.5kg of P10	14.8	37	-	-	37.00
1000 units of A53	3.75 per 100 units	-	37.5	-	37.50
					74.50
Direct Labour					
Grade M: 4.8hrs	2.5	12	-	-	12.00
Grade N: 9.2hrs	2.5	-	23	-	23.00
Grade O:	1.75	-	1	28.70	28.7

16.4 hrs					0 63.70
Production Overheads					
Machining:	11	58.20	101.12	-	153.92
Indirect Labour	6	-	-	98.4	98.4
	-	101.80	161.62	127.10	252.32

Standard Cost Summary:

	Shs.
Direct Materials:	74.50
Direct Labour	63.70
Production Overheads	252.32
Standard cost per unit	390.52

8.5 Behavioural Aspects of Standards

Standards and budgets rely heavily on the people who have to work to meet them. Because of the detailed nature of standard costing and its involvement with foremen and production workers, communication is crucial. Production workers frequently view performance review with a lot of suspicion, if a cost-conscious, positive attitude is to be developed, then close attention must be granted to the behavioral aspects of the system. In short, variance analysis is often not considered by those being evaluated as a neutral objective and purely technical process. This is because it has subjective and human aspects which in turn affect the employees' behaviour in the organization: These are discussed under the following headings:

- Goal congruence
- Motivation
- Communication

- Participation
- Goal definition

a) Goal Congruence

An ideal variance analysis and standard costing system should enhance goal congruence between:

i. The goal of individual departments and the individual employees and
ii. The goals of the organization as a whole.

This would prevent a conflict of goals and the resulting suboptimality.

However, total goal congruence is an ideal which is difficult to achieve completely and in practice, some reasonable level of sub optimality is ‘endured’ in the organization.

Goal congruence is enhanced when the employees to be evaluated using standard costing system are involved in **setting the standards and in evaluating their**

performance. This participative management style is by far preferred to the traditional autocratic system that overemphasized hierarchy and authority.

b) Participation

It has already been pointed out in the previous paragraph that standard costing systems would be more acceptable if the employees to be evaluated using those standards are involved in setting the standards. Participation promotes common understanding regarding objectives and makes the acceptance of organizational goals by the employees more likely. Variance analysis and the control process is also assisted by participation of the employees in the investigation of solutions to the problems which arise. If people are genuinely involved, they feel more a part of the team and become highly motivated.

c) Motivation

Variance analysis and standards setting needs to be carried out such that it

motivates managers and other employees. It should not create resentment and adverse reactions. To achieve motivational effects, the process must be:

- Participative
- One that encourages initiative and responsibility;
- One that is not seen as a mere pressure device
- Must be objective and uniformly applied to all
- Carried out in time.
- One that gives fair feedback to the employees, pointing out areas of positive and negative performance.
- Well linked to the penalty- reward system i.e. the positive performance is rewarded while negative performance is punished or corrected to enhance positive performance.

d) Goal Definition

The desired goals must be clearly defined to individuals, departments and the

organization as a whole. This clears confusion and sets a direction for the whole organization. Cleary defined goals, agreed upon by and accepted by the individuals concerned, will encourage goal congruence and increase motivation.

e) Communication

The process of communication, across and between the layers in the organization, is a critical element of all control systems. Standard costing, as a performance control systems, is not an exception! Frequent, up to date and accurate feedback of information to employees and managers regarding their performance has a motivating effect. It indicates areas in which improvement is needed so as to achieve the desired objectives. Communication also makes employees feel that their contribution in the organization is important.

8.6 Advantages of Standard Costing

1. **Management by Exception** The standard costing is an example of management by exception. By studying the variances, management's attention is directed towards those items, which are not proceeding according to the plan. Most of the management's time is saved and can be directed to other value adding activities. Management only concentrates on the 'few' exceptions reported.
2. **Cost Reduction** The process of setting, revising and monitoring standards encourages reappraisal of methods, materials and techniques thus leading to cost reductions. Analysis of unfavourable variances directs cost analysis to factors that are making costs to exceed the budgeted costs thus these factors can be controlled, leading to cost reduction.
3. **Pricing** Standard costs serve a s a reliable base of calculating total cost of producing a good or service, to which a margin can be added to determine the selling price.

4. **Inventory Valuation** Standard costing makes inventory valuation much easier, if the actual number of physical units in the inventory is known, then the inventory value is simply determined by multiplying the standard cot per unit by the physical units.
5. **Motivation** A properly developed standard costing system requires the full participation of all management levels (upper, middle and lower levels) and the employees. This creates motivation for the employees as they feel part of the system.
6. **Cost Control** A well implemented standard costing system acts as a yardstick against which all costs are measured to determine whether the variance from the standard is favourable or unfavourable. This creates cost consciousness in the organization and in the end enables the organization to control costs.
7. **Budgeting is made easier** One of the greatest benefits of standard costing is to be found in setting budgets for the organization and its departments. As

earlier illustrated once the desired output units are known, then the budgeted cost is simply the output units desired multiplied by the standard cost per unit.

i.e. Budgeted Cost = Output units x Standard Cost per unit

8. **Performance Evaluation is Simplified**
As already noted, standard costing creates a cost consciousness in the organization so that any cost can be easily evaluated whether it has favourable or unfavourable variance, so that appropriate corrective measures can be taken. Once budgets are prepared and agreed upon (anticipatively), and employees performance can be acceptably measure against the set standards to determine whether the performance is acceptable or not: appropriate corrective measures (punishment or reward) can then be acceptably taken by the management.

8.7 Disadvantages of Standard Costing

1. **The system of standard costing is expensive to install** A lot of money is spent in studying output requirements in terms of labour, materials and overheads.
2. **Time Consuming** A lot of time is also spent in developing and installing reliable standard costing systems.
3. **Obsolescence:** In fast changing conditions (e.g. in hyperinflationary economies where prices of labour, materials and overheads change rapidly), standards become out of date quickly. They therefore lose their control and motivational effects.

4. **Hard to Understand** Some standard costing systems are overly elaborate and are therefore not well understood by line managers and employees. This makes their implementation difficult.
5. **Effectiveness depends on Environment** For standard costing systems to be effective in cost control and performance evaluation, then a participative and democratic management style is required. The top

management and employees need to be committed to attaining the set standards of performance. An effective and efficient management information system is also required so as to provide employees and managers with reliable, accurate and timely feedback regarding their performance. Lack of one or more of these requirements frustrates the success of a standard costing system so that its effectiveness cannot be realized.

6. **It is Subjective** As we have already seen, there are several types of standards that an organization can adopt (basic, ideal, attainable and cement). What is therefore a standard in an organization depends on its management. It is also important to note that what is referred to as a significant variance depends on the organization's management, thus the subjectivity. If this subjectivity is poorly managed, (for example, punishing employees for insignificant unfavourable variances of for variances arising from factors beyond their control), then a standard costing system can

lead to employee frustration and poor goal congruence in the organization.

8.8 VARIANCE ANALYSIS

This section describes how material, labour and overhead variances are calculated and what causes each of those variances. A chart is also provided to describe how the variances add up to translate to a profit variance.

Insightful Note

In a typical organization, the planning process starts with a budget followed by actual performance. The budget will usually be based on standard costs of the desired output units. But how does a budget actual performance relate?

- Budgets are followed by performance
- Performance leads to preparation of a performance report, which compares the budgeted performance and the actual

performance, and therefore determines whether there is a favourable (F) or unfavourable (U) variance. These variances are exceptions, thus the performance report (Variance report) is an exceptions report.

- Variance signals those areas that require managerial attention and these are usually areas with problems. These variances lead to investigation in those problems areas and the appropriate corrective action is determined, recommended and later on implemented.

Note

Variance reporting concentrates on both favourable and unfavourable variances. Usually, unfavourable variances are punished on the responsible persons while favourable variances are rewarded. However, this is a rule of thumb but not always the case. Remember that an unfavourable variance might arise due to factors beyond the employee's or manager's control, in which case you can't

punish that person: rather, you need to explain the unfavourable variance in terms of the uncontrollable factor of alternatively adjust the standard to incorporate the changed circumstances. The same case can be argued for favourable variances.

a) Variance Analysis Defined

Variance analysis can simply be defined as the process of analyzing the difference between the standard cost and the actual cost (this difference is called the variance) into its constituent parts. The causes of variances are determined and management can take appropriate measures.

b) Why Perform Variance Analysis?

Variance analysis is aimed at obtaining practical pointers to the causes of off-the – standard performance so that management can improve operations, increase efficiency, utilize resources more effectively and reduce costs. For this to be achieved, the following need to be met:

- A simple standard costing system that is easily well understood by everyone in the organization.
- Fast and timely reporting of variances at the point of incidence so as to attach responsibility for favourable or unfavourable variance.
- Rapid management action to correct adverse (unfavourable) variances and encourage favourable variances.
- Utmost commitment to the process of setting standards and performance evaluation by all managers and employees.

However, not all variances are identified and acted upon. Only those types of variances, which fulfill the cost control needs of the organization and meet performance evaluation purposes of the entity are identified, calculated and acted upon. Thus, the only criterion for the calculation of a variance is its usefulness to the organization: if it is not useful for

management purposed, then it should not be calculated!

c) Attaching the Variance to Responsible Persons

In calculating variances, the calculations need to be **detailed enough** so that the **responsibility** for the variance can be **assigned to a particular individual.** This is necessary because it would be almost impossible to control costs if the responsibility for a certain variance is spread between many managers since each of them will "pass the buck" or refuse to accept personal responsibility for the variance.

For example, the material cost variance can be analyzed into usage variance and price variance. The usage variance is the responsibility of the foreman or production manager using those materials, while the price variance is the responsibility of the purchasing manger.

The above example illustrates how variance analysis is utilized to attach responsibility for cost variances to individuals. Such individuals cannot claim that they are not responsible for the variances arising. However, to be able to attach such responsibility, the costs must be controllable by the concerned individuals!

Due to tendency of budgetary control and standard costing variance analysis responsibilities to individuals, it is usually referred to as responsibility accounting. But where departments are interdependent, then responsibility accounting may not be straight forward due to inefficiencies or efficiencies brought in from other departments.

d) Relationship between variances

We cannot over emphasize the **central aim** of variance analysis as outlined in the above paragraphs: i.e. To assign responsibility for

a particular variance to a specific individual, assuming there is adequate independence between departments and the managers have full control of their departments so that they can be held fully responsible for the resulting variances.

Variance analysis subdivides the total difference between the budgeted profit and actual profit for the period into the detailed difference. This is illustrated in the figure below. Each of the managers responsible for each of the detailed variances can then he held responsible. But remember that only those variances useful for management controls are calculate.

At this point it is critical to understand that every variance has two aspects, a price aspect and a quantity aspect: these two aspects combine to produce a cost variance. This is illustrated below:

COST ELEMEN	**PRICE VARIANC**	**QUANTITY VARIANCE**

T	**E**	
Direct Labour	Rate	Efficiency
Direct Materials	Price	Usage
Variable Overheads	Expenditure	Efficiency
Fixed Overheads	Expenditure	volume

For example, direct labour cost = Direct labour + Direct Labour Variance Rate Variance Efficiency Variance

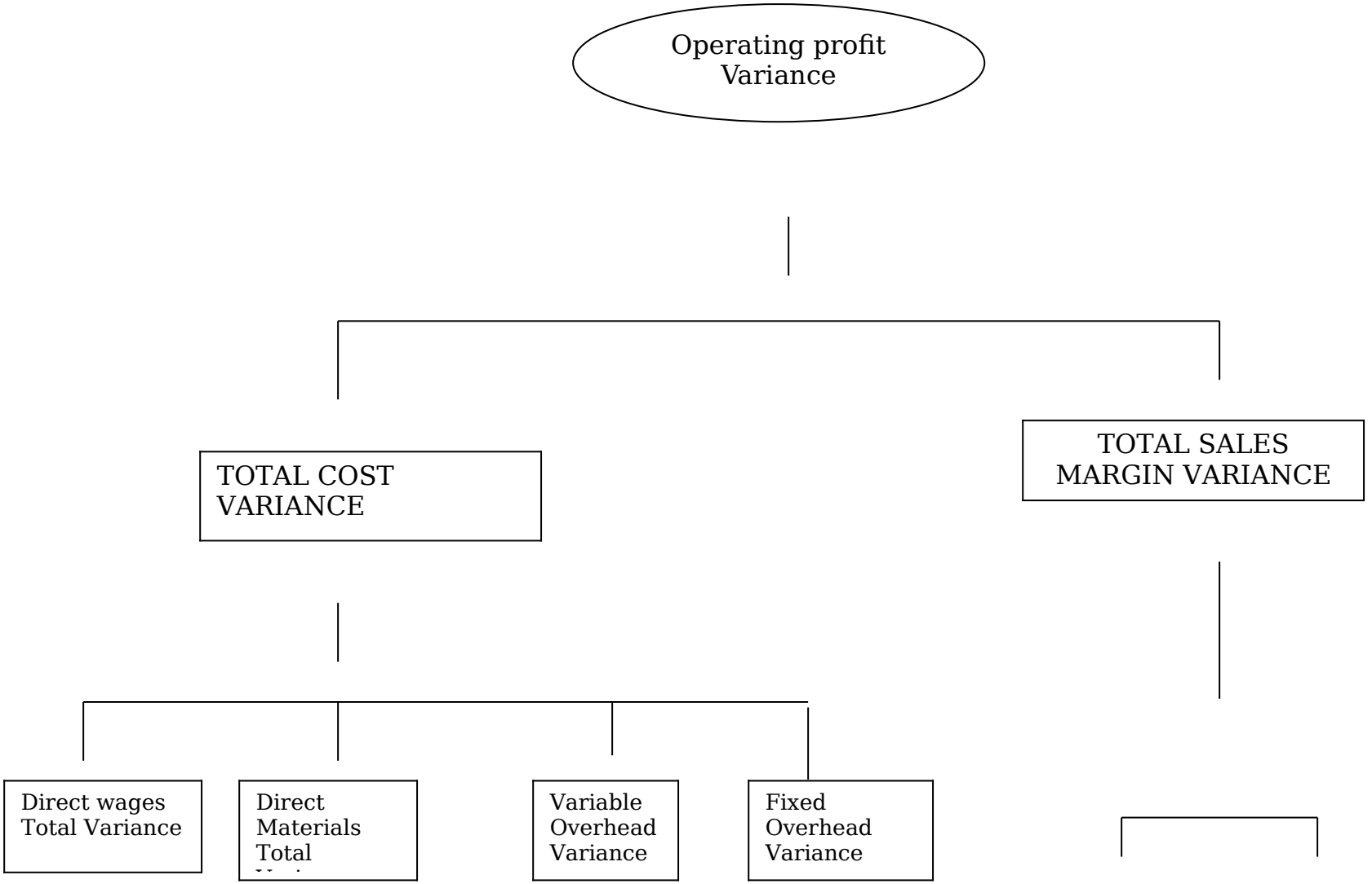
Also, Direct Material cost = Direct Material + Direct Labour Variance Price variance usage variance

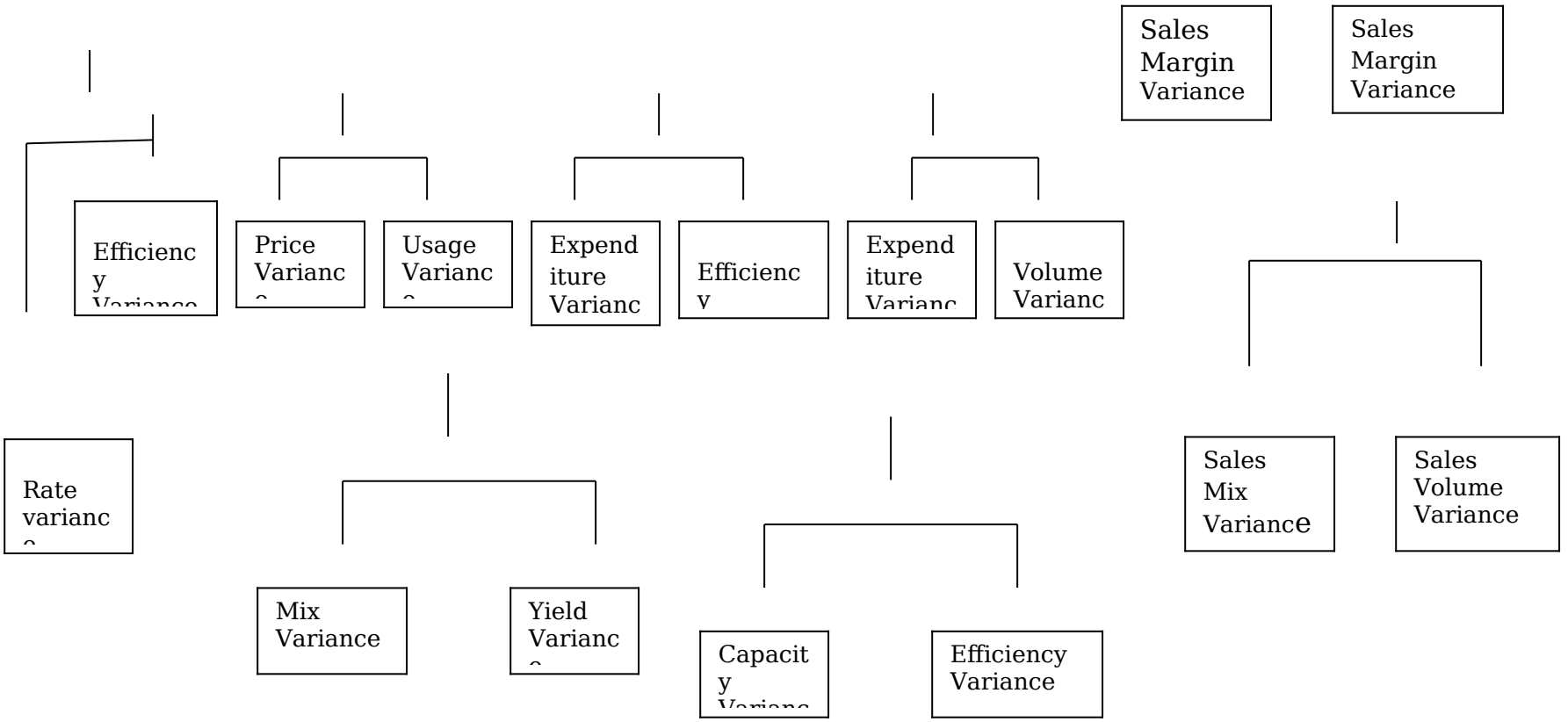
Etc.

Note that the operating profit variance, it follows, is then the sum of all the cost (labour, material, variable overheads, fixed overheads) variances and sales variances. Remember that the operating profit variance is simply the difference between the budgeted and actual profit. You then need to note that budgeted figures do not form part of the double entry system, and thus the budgeted profit variance does not enter the ledger accounts. The other reason why the operating profit variance is not entered in the ledgers is that it is a resultant figure i.e. a sum of all the other variances.

But all the other variances are entered into the ledger system and form part of double entry. We will see later how these variances are treated in the accounts

Variance Chart:




Sales Margin Variance
Sales Margin Variance
Efficienc y Variance
Price Varianc
Usage Varianc
Expend iture Varianc
Efficienc y
Expend iture Varianc
Volume Varianc
Rate varianc
Mix Variance
Yield Varianc
Capacit y Varianc
Efficiency Variance
Sales Mix Variance
Sales Volume Variance

INSIGHT NOTE:

Carefully note that when prices are being charged to production, this can be done at the actual or standard price. For purposes of making variances analysis useful, instant and easily understood, we will assume that the process of production changes the costs to production units at the **standard costs**. When units are changed with standard costs, it is now very easily to compare the standard cost with the actual costs and compute the variance immediately: consequently, the responsibility for the variances can also be assigned immediately and corrective measures implemented.

We will look at variances in the following order:

a) Direct Material Total Variance
b) Direct Labour Total Variance
c) Variable Overhead Total Variance
d) Fixed Overhead Total Variance.

For purposes of our calculations, we will assume the following basic data for company ABC limited:

The standard cost for the production of a radio cassette model called stereo F262 is as follows:

Inputs	Standard quantity	Standard price (shs)
Direct materials:	3 kg	4.00
Direct labour:	2.5 hrs	14.00

During the month, 6,500 kg of raw materials were purchased at shs.3.80 per kilo and all of it was used to produce 2000 units of finished products. Also, 4,500 hours of direct labour time were used at a total cost of shs.64,350.

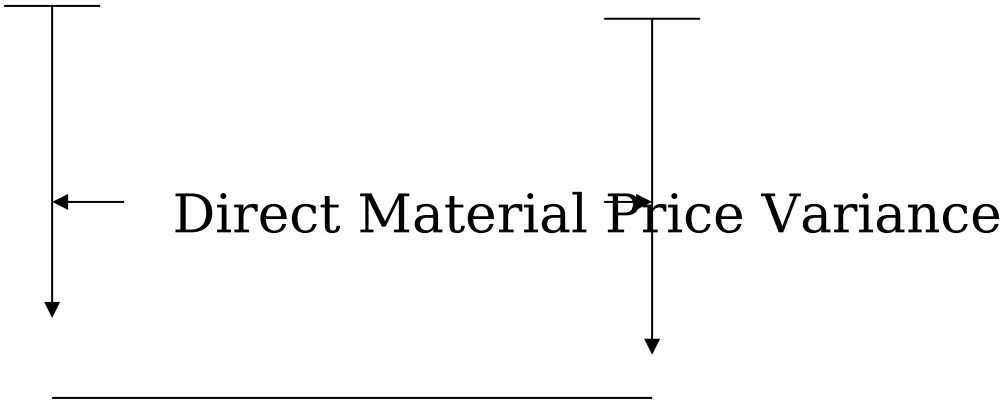
a) Direct Materials Total Variance

Direct materials total variances refers to the difference between the standard direct material cost of the actual production volume and the actual cost of the direct material. The direct materials total variances is a sum of two sub-variances, namely,

i. Direct Material Price Variance, and
ii. Direct Material Usage Variance.

i. **The Direct Material Price Variance** Refers to the difference between the standard price and the actual purchase price for the actual quantity of materials. It can be calculated at the time of purchase or time of usage. The latter is specific to the quantity of material utilized in production. But generally, in the calculation of direct material price variance, the quantity purchased is used as the basis of the variance.

Diagrammatically, the direct material price variance can be illustrated as follows:



Actual Price

The above diagram can be summarized in the form of an equation as follows:

Direct material = (Actual Quantity x Actual Price) – (Actual Quantity x Standard Price)
Price Variance
= (AQ.AP) – (AQ.SP)

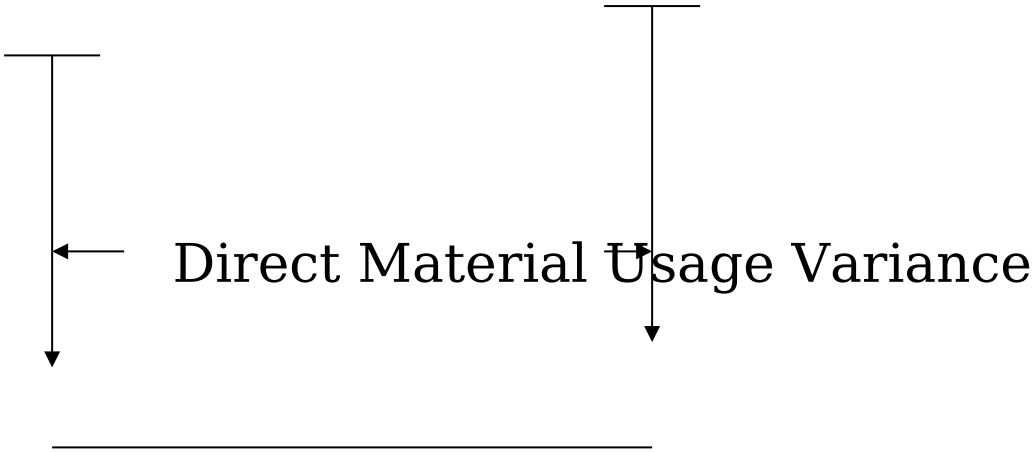
Factoring out the actual quantity from the equation, we get,
Direct Material Price Variance = AQ (AP – SP)

From the above equation, it is clear that the direct material price variance is as a consequence of the actual purchase price of direct materials being different from the standard p rice of the direct materials.

ii. **Direct Material Usage (Efficiency) Variance:** Refers to the difference between the actual quantity used and the standard

quantity specified for the actual production, all valued at the standard purchase price.

Again this is represented as follows diagrammatically;



Actual Quantity x **Standard** Price

Standard Quantity x Standard Price

The above diagram can be represented as follows using equations:

Direct Material = (Actual Quantity x Standard Price) – (Standard x Standard Price Usage Variance Quantity

= (AQ x SP) – (SP x SP)

Factoring out the standard price (SP) from the above equation gives us the following equation:

Direct material usage variance = (AQ – SQ) SP

It is again clear that the direct material usage variance arises due to the production department using more materials than expected (the standard).

Recap: The above two direct material price variances can now be summarized as follows:



Less:

Material

Actual Purchase Quantity x Standard Price

Total

Actual Purchase Quantity x Standard Price

Variance

Less

Standard Quantity used for the Actual Production X Standard Price

Usage Variance

From our basic data first before the beginning of the discussion on variances, we can calculate:

i. Direct Materials price variance = (AQ X AP) – (AQ X SP)

= (6,500 X 3.80) – (6,500 X 4)

= 6,500 (3.80 – 4)

= Kshs.1,300 Favourable

The variance is favourable since we used less costs than the standard cost.

Direct Materials usage variance = (AQ X AP) – (SQ X SP)
= (6,500 X 3.80) – (6,000 X 4)
= 24,700 – 24,000
= 700 Unfavourable

Note that the above equation (total materials variance) agrees with the following:

Total Materials Variance = Price Variance + Usage (Efficiency) Variance
= 1300 (Favourable) + 2000 (Unfavourable)
= Kshs.700 unfavourable.

Tutorial Note Please make sure you follow the basics of the calculation of the direct material variances calculations so that you can effectively follow the following variances sections.

b) Direct Labour Total Variance

This is the difference between the standard direct labour cost and the actual direct labour cost incurred for the production achieved. It is a sum total of the direct labour rate variance and the direct labour efficiency variance.

Direct Labour Rate Variance: This is the difference between the actual direct labour rate and the standard direct labour rate for the total hours worked.
Using an equation, this can be shown as follows;

Direct labour rate Variance = (Actual Labour Hours x Actual Rate) - (Actual hours x Standard Rate)

= (AHrs x AR) – (AHrs x SR)

= A HRs (AR – SR).

It is clear from the above equation that the direct labour rate variance arises due to the actual rate paid for the actual labour hours worked differing from the standard rate that was expected to be paid for those labour hours.

Direct Labour Efficiency Variances This is the difference between the standard hours allowed for the actual production achieved and the hours actually worked, all valued at THE standard labour rate. Using an equation, this can be shown as follows:

$$\text{Direct labour Efficiency Variance} = \left(\begin{matrix}\text{Standard}\\ \text{Labour Hours}\end{matrix}\right) - \left(\begin{matrix}\text{Actual labour}\\ \text{hours}\end{matrix}\right) \times \left(\begin{matrix}\text{Standard}\\ \text{Rate}\end{matrix}\right)$$

= (AHrs x SR) – (SHrs x SR)

Factoring SR out of the equation we get
Direct Labour efficiency variance = SR (AHrs – SHrs).

Thus, the direct labour efficiency variance arises due to the actual hours used in production varying from the standard hours expected to have been used.

NB: The direct labour efficiency variance is also called the **direct labour usage variance.**

Recap:

Actual Labour Hours x Actual Rate — Rate Variance — Total Direct Labour variance

Less:

Actual Labour Hours x Standard Rate

Actual Labour Hours x Standard Rate — Efficiency Variance

Standard Labour hours x Standard Rate

From our basic data, we can calculate the labour variances as follows:

i. Labour Rate Variance = (AH x AR) – (AH x SR)

= AH (AR – SR)

NB: AH x AR = Shs.64,350

∴ Labour Rate Variance = 64,350 – (4,500 x 14)

= Shs.1,350 Unfavourable.

The rate is unfavorable because we spent more than expected.

ii. Labour Efficiency (usage) variance: = (AH X SR) – (SH x SR)

= (AH – SH) SR

= (4,500 – 5,000) 14

= 7,000 Favourable

The variance is favourable because we spent less than the expected cots.

Note: Total Labour Variance = Rate Variance + Efficiency Variance

= 1,350 (Unfavourable) + 7,000 (Favourable)

= Shs.5,650 Favourable.

Developing and Insight into Material and Labour Variance

The calculation of material and labour variances is not enough; we need to know how the variance could have typically occurred in the first place, and whether there is any connection between one cause of the variance to another. For example, a higher price of materials could have resulted in an unfavourable direct material price variance: but, due to the high quality (though high priced) input materials; this could have led to a favourable efficiency variance!

The above paragraph leads to an important question. What typically causes variances of direct labour and direct materials? This question is answered in the sections that follow.

Typical Causes of Material Variances

Price Variances

a) Paying higher or lower prices than planned.
b) Losing or gaining quantity discounts by buying in smaller or larger quantities than planned.
c) Buying lower or higher quality than planned.
d) Buying substitute material due to unavailability of planned material.

Usage (Efficiency) Variances

a) Greater or lower field from material than planned.
b) Gains or losses due to use of substitute or gather/lower quality than planned.
c) Inefficiency or efficient machinery.
d) Grater or lower rate of scrap than anticipated.
e) Poorly trained workers or extremely high quality labour.

Typical Causes of Labour Variances

Labour Rate Variances

a) Higher rates being paid than planned due to wage (increase) awards.
b) Higher or lower grade of workers being used than planned.
c) Payment of unplanned overtime or bonus.

Labour Efficiency Variances

a) Use of incorrect grade of labour e.g. poorly trained personnel.
b) Poor workshop organization or supervision.
c) Incorrect materials or machine problems.
d) Use of better quality labour
e) Increase labour or decrease labour efficiency.

OVERHEAD VARIANCES

Introduction

This section will describe how the variable overhead total variance and the fixed overhead total variances calculated. You can recall the overheads refer to production costs that cannot be categorized as direct since

they cannot be directly traced to an individual unit of production.

It is necessary to recall that overheads are absorbed into costs by means of **Predetermined Overhead Absorption Rates (OAR).** The overhead absorption rate is predetermined as follows:

$$\text{OAR} \quad \frac{\text{Budgeted overhead costs for the period}}{\text{Budgeted Activity Level}}$$

The activity level so budgeted could be expressed as units, weight, sales etc: but the most useful concept of the activity level is the **standard hour**. Thus, the total overhead absorbed = OAR x Standard hours of production.

Where the standard costing system uses Total absorption costing principles (where both fixed and variable overheads are absorbed into production costs), the total overheads absorbed can be sub-divided into Fixed Overhead Absorption Rates (FOAR) and Variable Overhead Absorption Rates (VOAR).

Thus,
Fixed Overhead Absorbed = FOAR x Standard hours of production
Variable Overhead Absorbed = VOAR x Standard hours of production.
Total Overheads Absorbed = (FOAR + VOAR) x Standard hours of production

But where the standard marginal costing principles are utilized by the standard costing system, only variable overheads are absorbed into production costs and thus only variances relating to variable overheads arise. This makes overhead variance analysis a bit easier in this case.

Again for purposes of our illustrations in overhead variance analysis, we will assume the following basic data for company ABC Ltd in the production of a radio cassette model Stereo F262:

Budget for December 2003;	Shs.

Fixed Overheads	11,480
Variable Overheads	13,120
Labour Hours	3,280 hours
Standard Hours of Production	3,280 hours

Actual Results for December 2003	Shs.
Fixed Overheads	12,100
Variable Overheads	13,930
Actual Labour Hours	3,150/ hours
Standard Hours of Production	3,280 hours

Note

Based on our budget above, the predetermined overhead absorption rates can be computed as follows:

$$F.O.A.R = \frac{\text{Budgeted fixed overheads}}{\text{budgeted activity level}} = \frac{\text{Shs.11,480}}{\text{3,280 std hours}} = \text{Sh.3.5/h}$$

$$F.O.A.R = \frac{\text{Budgeted Variable Overheads}}{\text{Budgeted activity level}} = \frac{\text{Shs.13,120}}{\text{3,280 std hrs}} = \text{Shs.4/}$$

$$\text{Total OAR} = \text{FOAR} + \text{VOAR} = \text{Shs.3.5} + \text{Shs.4} = \text{Shs.7.5/hr}$$

Total OAR = FOAR + VOAR = Shs.3.5 + Shs.4 = shs.7.5/hr.

It is also notable from our budget that the budgeted labour hours and the budgeted standard hours of production are the same: this is the normal planning basis, which assumes that the actual labour hours will be the same as the standard hours actually produced. This would imply that efficiency is as initially planned so that no efficiency variances would arise. However, this is rarely the case in practice and therefore the efficiency variances in overhead variances analysis.

Start Note:

The total overhead variance can be broken down into its two constituent parts, namely:

i. The variable overhead variance, and
ii. The fixed overhead variance

We will look at each of these individually.

i. Variable Overhead Variance

This is the difference between the actual variable overheads warned and the variable overheads absorbed. It can therefore be described as the underabsorbed or overabsorbed variable overheads.

The **variable overhead expenditure variance** is made up of two components, namely:

a) The variable overhead expenditure variance,
b) The variable overhead efficiency variance

The **variable overhead expenditure variable is the difference** between the actual variable overheads incurred and the

allowed variable overheads based on the actual hours worked. This is calculated as follows:

Variable Overhead Expenditure variance = Actual Variable Overheads - (Actual Labour Hours x V.O. A. R).

The **variable overhead efficiency variance** is the difference between the **allowed** variable overheads and the **absorbed** variable overheads and the absorbed variable overheads. This is calculated as follows:

$$\text{Variable Overhead Efficiency Variance} = \left(\begin{array}{l}\text{Actual Labour}\\ \text{hours x V.O.A.R}\end{array}\right) - \left(\begin{array}{l}\text{Standard hours of}\\ \text{Production x V.O.A.R}\end{array}\right)$$

Recap:

The above discussion of variable overhead variances can be summarized as follows:

Actual Variable Overheads Incurred } Variable Overheads
Less: Actual Labour hours x V.O.A.R. } Total Variable
Expenditure Variance

Overheads Variance
Actual Labour Hours x V.O.A.R
Variable Overheads
Less: Efficiency Variance.
Standard Hours of Production x V.O.A.R

Using our basic data, we can then calculate the variable overheads variances as follows:

i. Variable Overhead Expenditure Variance = Actual Variable Overheads - (Actual labour hours x V.O.A.R)

= Shs.13,930 – (3,150 x 4)
= Shs.13,930 – Shs.12,600
= Shs.1,330 Unfavourable

The variance is unfavourable because we spent more than allowed.

ii. Variable Overhead Efficiency Variance = (Actual Labour hours x V.O.A.R) - (Standard Hours of Production x V.O.A.R)

= (3,150 x 4) – (3,230 x 4)

= Shs.12,600 – Shs.12,920

= Shs.320 Favourable

The variance is favourable because we spent less than the standard cost.

Note

The total variable overheads variances = Variable Overhead Expenditure Variance + Variable Overhead Efficiency Variance

= Shs.1,330 (U) + Shs.320 (F) = Shs.1,010 (U)

This can also be directly obtained by calculating the difference between the actual variable overheads cots incurred and the production cost absorbed in variance overheads;

i.e. shs.13,930 – (3,230 x 4) = Shs.13,930 – Shs.12,920

= Shs.1,010 (U)

ii. Fixed Overheads Variance

This is defined as the difference between the standard cost of fixed overheads absorbed in the production achieved (whether completed or not), and the fixed overheads attributed and charged to that period.

This is in fact the over or underabsorbed overheads for the period under consideration.

The fixed overhead volume variance has two main components namely:

- Fixed overhead expenditure variance, and
- Fixed overhead volume variance

The fixed overhead expenditure variance is the difference between the budget cost allowance for production for a

specified control period and the actual fixed expenditure attributed to and charged to the period. It is therefore the difference between the actual and budgeted fixed overheads.

The fixed overhead volume variance is the difference between the standard cost absorbed in the production achieved and the budget cost allowed for the period. It arises due to the actual production volume differing from the planned: this is in turn caused by volume differing form the planned: This is in turn caused labour efficiency variance and or capacity variance (hours of working being less or more than planned). The fixed overhead efficiency variance, and

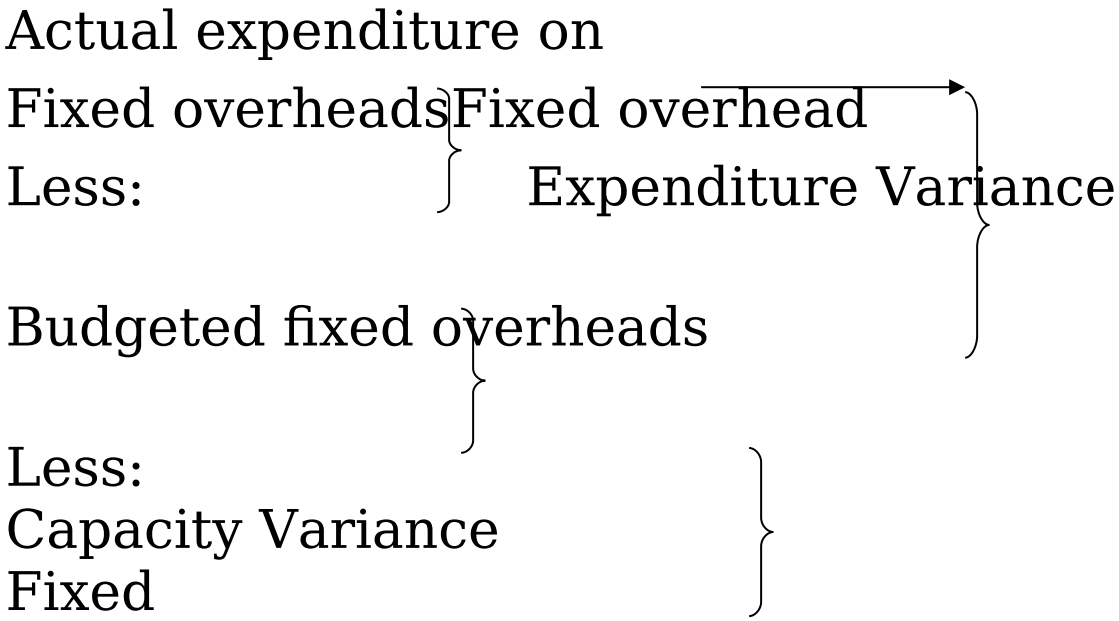
The fixed overhead capacity variance.

The fixed overhead efficiency variance is the portion of the fixed overhead volume variance which is the difference between the standard cost absorbed in the production achieved whether completed or

not, and the actual labour hours worked. (valued at the standard hourly absorption rate).

Recap:

The above discussion can be summarized as follows:



Referring to our basic data, we can calculate the fixed overhead variances as follows:

Fixed Overhead Expenditure Variance:

= Actual Fixed Overheads – Budgeted Fixed Overheads

= Shs.12,100 – Shs.11,480 = Shs.620 (Unfavourable)

Fixed Overhead Capacity Variance:

= Budgeted fixed Overheads – (Actual Hours x F.O. A. R)

= Shs.11,480 – (3,150 x 3.5) = Shs.455 Unfavourable

Fixed Overhead Efficiency Variance:

= (Actual Hours x F.O.A.R) – (Standard Production Hours x F.O.A.R)

= (3,150 X 3.5) - #,230 X 3.5) = Shs.280 Favourable.

Fixed Overhead Volume Variance

= Fixed Overhead Capacity Variance + Fixed Overhead Efficiency Variance.

= 455 (U) + 280 (F) = Shs.175 (Unfavourable)

Fixed Overhead Variance

= Fixed Overhead Expenditure Variance + Fixed Overhead Volume Variance

= Shs.620 (Unfavourable) + Shs.175 (Unfavourable)

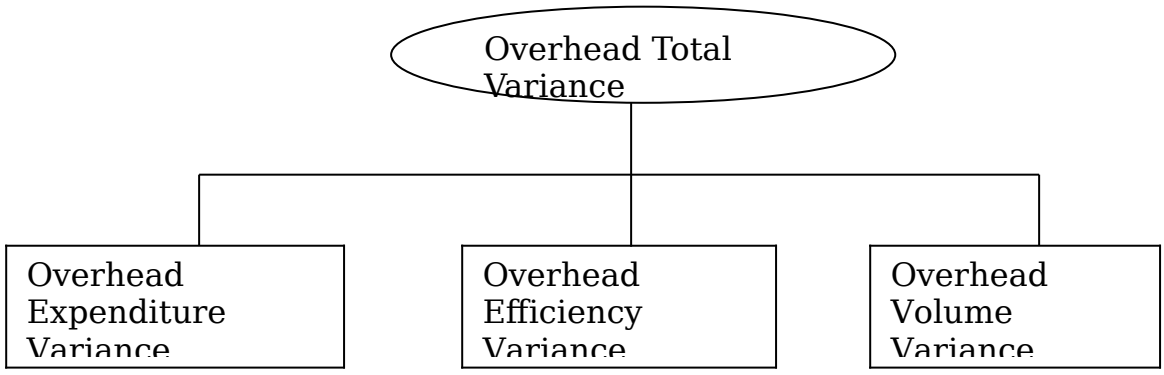
= Shs.795 (Unfavourable).

The approach described so far is the most commonly used especially for examination. Another purpose that the student should be confident enough with so far for further insights, the student could proceed to the following section.

A Simpler Alternative to Total Overhead Variances.

There is a simpler approach to overhead variances. In this approach, the overheads

are NOT sub-divided into their fixed and variable elements. Thus, the following variances are calculated.



The variances indicated above are defined as follows:

Overhead Total Variance: Is the difference between the standard overhead cost specified for the production achieved and the actual cost incurred.

Overhead Expenditure Variance: Is the difference between the actual overheads expenditure and the budgeted overheads.

Overhead Efficiency Variance: Is the difference between the standard overhead rate for the production achieved and the standard overhead rate for the actual hours taken.

Overhead Volume Variance Is the difference between the standard overhead cost of the actual hours taken and the flexed budget allowance for the actual hours taken.

The above narrations are summarized in the below formulae:

Actual Total Overheads } Expenditure
Less: } Variance
Budgeted Total Overheads
Less: } Volume } Overhead
Actual Hours x O.A.R } Variance
Total Variance
Less: }
Standard Hours Produced x O.A.R }
Efficiency
Variance

NB: O.A.R = Total Overhead Absorption Rate.

Using our basic data, we can calculate the total overhead variances using the alternative approach as follows:

Overheads Expenditure Variance = (Actual – Budgeted) Overheads

= Shs.26,030 – Shs.24,080
= Shs.1,950 Unfavourable

Overheads Volume Variance = Budgeted Overheads – (Actual Hrs x O.A.R)

= Shs.24,080 – (3,150 x 7.5)
= Shs.455 Unfavourable

Overheads Efficiency Variance = (Actual Hours x A.O.R) – (Standard hours produced x O.A.R)

= (3,150 x 7.5) – (2,330 x 7.5)
= Shs.600 Favourable

*Note that this figure is arrived at by flexing the budget as follows:

	Shs
Fixed Overheads:	11,480
Variable Overheads:	12,6

(3,150 x 4)	00 24,0 80

You need to keenly note that this latter method is merely a summary of the variable and fixed overhead variances calculated earlier using the previous method as shown below:

	Expenditure	**Efficiency**	**Capacity**	**Total**
Variable overhead variance	1,330 (U)	320 (F	-	1,010 (U)
Fixed overhead variances	620 (U)	280 (F)	455(U)	795 (U)
Total overhead variances as calculated above	1,950 (U)	600 (F)	455 (U)	1,805 (U)

- What was previously capacity variance is directly equivalent to the volume variance when the total overhead approach is used.

What Causes Overhead Variances?

Overhead variances arise mainly due to the conventions of the overheads absorption process. The overhead absorption rates utilized in this process are calculated form two main estimates:

i. Estimates of expenditure levels.
ii. Estimates of the activity levels during the budget period.

Since the two elements are mere estimates, they hardly coincide with reality, and therefore will almost certainly cause a favourable or unfavourable variance in any given accounting period.

Overhead variances are also caused by efficiency variations. Because overheads are frequently absorbed into production by means

of labour hours, overhead variances arise when labour
efficiency is greater or less than planned.

How are Overhead Variances Useful for Control Purposes?

Overhead variances are essentially a book balancing exercising providing an arithmetic reconciliation between the standard costs and actual costs. Apart form the expenditure variance, the calculation of the other overhead variances provides **little real control information,** since they are related more to the conventions of overhead absorption than to the organization's operational reality.

However, the information used in calculating the efficiency and volume variances, (i.e. the budgeted labour hours, the actual labour hours and the standard labour hours), can be used to calculate various ratios which provide clear information on important aspects of the firm's operations. These ratios are:

i. **The Activity Ratio:** This is calculated as follows:

$$\text{Activity Ratio} = \frac{\text{Standard Hours Produced}}{\text{Budgeted Hours}} \times 100$$

This ratio is equivalent to the fixed overhead volume variance.

ii. **Capacity Ratio:** This is calculated as follows:

$$\text{Capacity Ratio} = \frac{\text{Actual Labour Hours Worked}}{\text{Budgeted Labour Hours}} \times 100$$

This ratio is equivalent to the fixed overhead capacity variance.

iii. **Efficiency Ratio:** This is calculated as follows:

$$\text{Efficiency Ratio} = \frac{\text{Standard Hours Produced}}{\text{Actual Labour Hours Worked}} \times 100$$

This ratio is equivalent to the fixed and variable overheads as well as labour efficiency ratios.

NB: The above control ratios are directly related to the variances they are

connected to and they provide management with a useful relative measure rather than the absolute measures provided by the variances.

8.9 MAKING VARIANCE ANALYSIS MORE MEANINGFUL

To make variance analysis a useful aid to management is the main objective of variance calculations. But this can only be done if we investigate the variances and the data used to calculate them. Typical questions that could be asked include:

i. Is there any relationship between the vacancies e.g. did we report an unfavourable material usage variance because we reported a favourable material price variance as a result of purchasing low quality materials?

ii. Can further information than merely the variance be provided by the management as to what could have resulted in the variance? E.g. did the budget use an unrealistic

overhead absorption rate leading to capacity and efficiency variances?

iii. Is the variance significant and worth reporting? (Materiality). It is no point concentrating on very small variances. Normally the management sets a significance level of variances e.g. variances are only investigated only if they beyond ± 20% of the expected value. Thus, a variance of between 1% and 19% would not be investigated.

iv. Are the variances being reported quickly enough, to the right people, in sufficient or too much detail, with explanatory notes and is follow-up done to ensure correction of the situations leading to variances occurring?

CONSIDERATIONS IN VARIANCE INVESTIGATION:

As already noted above, not all variances are investigated, it is only the material and meaningful (for cost control purposes)

variances that are investigated for further management action. But even as we go into investigating what caused a variance to occur, we need to consider the following factors:

i. **Materiality** Management should define the materiality level which when reached needs to be investigated. All variances below the materiality level are not investigated.

ii. **Sensitivity to Cash Flow** We need to consider which variances translate into cash flow implications e.g. price variances. If a variance is very highly sensitive to cash flows, then we need to set a low materiality level while if a variance has very low sensitivity to cash flow, then we need to set a high materiality level.

iii. **Frequency of Occurrence** A variance that occurs frequently or consistently needs to be investigated as early as possible.

iv. **Control** We only need to hold managers accountable for the variances which they could control. Variances caused by factors beyond the managers control cannot be blamed on the manager, e.g. external factors such as the government actions, inflation and unfavourable exchange rates could cause adverse variances which the managers cannot be held responsible for.

v. **Cost-Benefit Analysis** If the cost of investigating a variance exceeds the benefits of such organization, then there is no need of investigating the variance as it is a waste of resources. The reverse is correct.

vi. **The management Style** In an autocratically managed organization all variances are investigated as actions are not expected to deviate from the stipulated. In a democratically managed organization, only the material variances would be investigated.

REINFORCING QUESTIONS

QUESTION ONE

Bidii Company Ltd. Manufactures a single product and uses standard costing. The standard costs for producing one unit of the product are as follows:

	Shs
Direct material:	
Material X (3Kgs)	30
Material Y (5 Kgs.)	25
Direct labour (5 hours)	40
Production Overheads:	
Variable	30
Fixed	20
Standard unit cost	145

Note: Overhead is applied on basis of direct labour hours.

In the month of May 20X6, the company had budgeted to produce 10,000 units. However, 11,000 units were actually produced and the costs incurred were as follows:

	Shs.	Shs.
Material cost:		
Material X (34,000 Kgs.)	323,000	
Material Y (52,000 Kgs)	312,000	635,000
Labour costs (51,000 hours)		433,500
Manufacturing Overheads:		
Variable	340,000	
Fixed	220,000	560,000

Total manufacturing costs	1,628,500

Note: There was no charge in stock of work in progress.

Required

Calculate the following variances indicating whether they are favourable (F) or unfavourable (U):

(i) Material price variance

(ii) Material usage variance

(iii) Labour rate variance

(iv) Labour efficiency variance

(v) Total variable overhead variance

(vi) Total fixed overhead variance.

(Total: 20 Marks)

QUESTION TWO

Maputo Ltd. Manufactures and sells one brand of washing soap. The sale price per

one dozen packet is Sh.50. The standard production cost is Sh.42.80 per dozen arrived at as follows:

	Shs
Direct materials:	12.00
Material A – 3 Kg. @Sh.4	
Material B – 2 litres @ Sh.5	10.00
Direct labour: ½ hour @ Sh.20	10.00
Overheads:	
Variable	7.20
Fixed	3.60
	42.80

Factory overheads are allocated on the basis of machine at the rate of sh.12 per hour. During the last financial year the company had budgeted to produce 72,000 dozen packets. However, material shortages limited production to 64,000 dozen packets for which the following costs were incurred:

	Shs
Material A 194,000 Kg.	780,800
B 130,000 litres	625,000
Direct labour 35,000 hours	684,000
Variable overheads	384,000
Fixed overheads	250,000

The company utilized 60,000 machine hours

Required

a) Calculate the following variances:

i. Material price and usage variance (6 marks)

ii. Labour rate and efficiency variances (4 marks)

iii. Variable overhead spending and efficiency variances. (4 marks)

iv. Fixed overhead volume variance
(3 marks)

b) What is the significance of the fixed overhead volume variance calculated above
(3 marks)

(Total: 20 marks)

QUESTION THREE

Beauty Products Ltd. Are manufactures of a body lotion that is sold to retailers in packages of 24 one-quarter litre bottles. In the month of July, 750 packages were produced and sold. Details regarding production costs are given below:

	Shs
Sales (750 packages @ Sh.360 each)	270,000
Production costs:	
Direct materials:	
Material A – 15,000 litres	24,000

@ Sh.1.60 per litre	
Material B – 16,500 litres @ Sh.2.90 per litre	47,850
Labour – 3,200 hours @ Sh.15 per hour	48,000
Overheads	70,000
	189,850
	80,150
Gross profit	
Operating expenses	
Packaging costs – 750 packages @ sh.20	15,000
Administrative costs	55,000
NET PROFIT	10,150

Beauty Products had budgeted to produce and sell 1000 packages for the month of July. At this production level they anticipated a net profit of sh.90,500 as shown below:

Shs

Sales (1000 packages @ Sh.365 each)	365,000
Production costs:	
Direct materials:	
Material A – 15,000 litres @ Sh.1.50 per litre	22,500
Material B – 16,500 litres @ Sh.3.00 per litre	54,000
Labour – 4,000 hours @ Sh.13.80 per hour	55,200
Overheads: based on 150% labour costs	82,800
	214,500
	150,000
Gross profit	
Operating expenses:	
Packaging costs – 1000 packages @ sh.15	15,000
Administrative costs (all	45,000

fixed)

NET PROFIT (budgeted) 90,500

Required

a) Prepare a flexible budget profit and loss statement for the production level achieved for Beauty Products Ltd. For the month of July (6 marks)

b) Determine the effect (favourable or unfavourable) that the failure to achieve the target sales of 1000 units in July had no budgeted profit for each of the following items show your calculations)

i. Sales
ii. Materials
iii. Material A and Material B
iv. Labour
v. Overheads
vi. Packaging material
vii. Administrative costs

(12 marks)

c) Explain briefly TWO other major factors (apart from the failure to achieve target sales) which are causes of the

difference between budgeted and actual profit. (Calculations are not necessary) (4 marks)

(Total: 22 marks)

QUESTION FOUR

For a product the following data was given:

Standards per unit of product:

Direct material 4 kilogrammes at Sh.0.75 pr kilogramme

Direct labour 2 hours at sh.1.60 per hour

Actual details for a given financial period:

Output produced in units		38,000
Direct materials:		Shs
Purchased	180,000 kilogrammes for	126,000

Issued to production	154,000 kilogrammes	
Direct labour	78,000 hours worked for	136,500

There was no work-in-progress at the beginning or end of the period.

You are required to

a) Calculate the following variances:

(i) Direct materials costs;
(ii) Direct materials price, based on issues to production;
(iii) Direct material usage;
(iv) Direct wages cost;
(v) Direct wages rate;
(vi) Direct labour efficiency;

b) State whether each of the following cases, the comment given and suggested as the possible reason for the variance, is consistent or inconsistent with the variance you have calculated in your answer to (a) above, supporting each of your conclusions with a brief explanatory comment.

Items in

a.

(i) Direct materials price variance; the procurement manager has ignored the economic order quantity and, by obtaining bulk quantities, has purchased material at less that the standard price;

(ii) Direct materials usage variance: material losses in production were less than had been allowed for in the standard;

(iii) Direct wages rate variance: the union negotiated wage increase was Sh.0.15 per hour lower than expected;

(iv) Direct labour efficiency variance: the efficiency of labour was commendable.

QUESTION FIVE

Maridadi People Ltd., an exclusive cosmetic business, manufactures a popular perfume, known as Jasho, which it sells in bottles, thorough its retail shops for Sh.2,000. During the latest quarter ending 30 September 20X1,

the company budgeted to make a profit of Sh.875,000 before deducting fixed overheads amounting to Sh.400,000. The standard cost per bottle is shown below:

		Shs
Materials	- 10 Kg @ Sh.50 per Kg	500
Labour	- 10 hours @ Sh.60 per hour	600
Variable factory overheads		200
Marginal cost per bottle		1,300
Fixed factory overheads		320
Total cost per bottle		1,620

Factory overhead costs (variable and fixed) are absorbed into products on the basis of direct labour hours.

Actual results for the quarter as follows:-

		Shs
Sales	- 1,100 bottles	2,365,000
Raw Materials (14,000 Kg)		784,000
Labour	(15,000 work hours)	997,500
Variable factory overhead incurred		320,800
Fixed factory overheads incurred		441,700

Production in the quarter amounted to 1300 units. Out of the total raw materials purchased, 2000 Kg. Are still in stock. There were no operating balances of raw materials or finished goods stocks. It is the policy of

the company to value all stocks at standard cost.

Required

a) Calculate the following variances; indicting clearly whether they are favaourable (F) or unfavourable (U): -

i. Material price and usage.

ii. Labour rate and efficiency

iii. Variable factory overhead over or under absorbed

iv. Sales price and sales margin quantity.

(15 marks)

b) Independently calculate the operating profit variance; and explain its significance.

(3 marks)

c) Why should management investigate favourable significant variances? (2 marks)

(Total: 20 marks)

CHECK YOUR ANSWERS WITH THOSE GIVEN IN LESSON 9 OF THE STUDY PACK

COMPREHENSIVE ASSIGNEMENT No.4

To be carried out under examination condition and sent to the Distance Learning Administrator for marking by the University

Time Allowed: 3 Hours Attempt All Questions

QUESTION ONE

1. Shirikisho Engineers Ltd produce a standard type of energy conserving Jiko under the brand name “charcoal saver”. The company operates a standard costing system and prepares its operating statements on a monthly basis.

The results for the month of March, 20X3 were as shown below:

	Shs	Shs
Sales		108,000
Manufacturing costs:		
Direct materials	28,800	
Direct labour	17,10	

	0	
Overheads (fixed)	25,000	
	0	
		70,900
		0
Manufacturing profit		37,100
		0
Selling and distribution (variable)		6,300
Administration (fixed)		14,400
		0
Net profit		16,400
		0

Shirikisho management were perplexed as they had expected a profit of sh.27,000 having produced and sold 9,000 jikos out of the budgeted 10,000 jikos for the month. They decided to consult a management accountant who attributed the shortfall from their expected profit as follows:

	Shs	Shs
Expected profit		27,00

		0
Less explanatory variance:		
Material cost	1,800	
Labour cost	(900)	
Overhead	7,000	
Selling and distribution	1,800	
Administration	900	
		10,600
ACTUAL PROFIT		16,400

You are required to

a) Prepare Shirikisho's original budget for the month of March based on production and sale of 10,000 jikos
b) Calculate what should have been the correct expected profit by Shirikisho's management assuming efficient operations for the output achieved in the month of March 20X3.
c) Explain the importance of both the static and flexible budget.

(Total: 20 Marks)

QUESTION TWO

Sam Makengi plans to incorporate a company to be known as Makengi Holdings Ltd. For the distribution of locally made automotive spare parts. He intends to contribute an initial capital of Sh.45,000 in cash. After approaching his bank manager for financial support, he was asked to submit projected statements of the profits and cash flows of he business for the next four months commencing 1 July 1988. After careful analysis, Makengi gathered the following information relating to the business operations for the six months to December 31,20X8:

i. At the begging of July operating furniture and equipment will be acquired for cash at a total cost of sh.88,000. In addition, stocks costing Sh.50,000 will be acquired out of which half will be paid for in cash and the balance in the following month.

ii. Stock levels will be maintained at a level that is sufficient to satisfy sales for the next month. The company intends to earn a gross margin of 50% on sales. Credit terms from suppliers require payment after one month form the date of purchase.

iii. Sales are expected to average Sh.60,000 per month for the next one year. It is expected that 75 per cent of customers will pay in cash and 25 per cent will take credit. All credit sales are due within 30 days.

iv. The following monthly expenses will be incurred:

Rent – Sh.10,000; Salaries – Shs.6,000; Miscellaneous expenses – Sh.2,500; Depreciation – Sh.3,000.

All expenses will be paid for in the month in which they are incurred, except for rent, which is payable quarterly in advance.

v. The proprietor expects to withdraw Shs.5,000 from the business every month for personal use.

Required

Prepare a cash budget for each of the months of July, August, September and October 20X8 for Makengi Holdings Ltd. The budget should be columnar form and all supporting workings should be shown.

(Total: 20 Marks)

QUESTION THREE

"Budgetary Control can be operated even without adoption of standard costing system".

Required:

Explain both budgetary control and standard costing and show how the former is not dependent on the latter.

QUESTION FOUR

a) "Variance Analysis is a useless exercise unless the information obtained from its analysis can be meaningfully translated." Explain four questions that you would typically ask to achieve the objective of the above statement.
(8 marks)

b) Management should put in some serious considerations before investigating variances. Explain six such considerations.
(12 marks)

(Total: 20 marks)

QUESTION FIVE

Pee Company, a manufacturer of retread tyres has provided the following information about operations during the financial year ended 30 September 20X0.

Production	40,000 units
Sales	30,000 units

Production costs incurred	**Shs**
Direct materials	9,600,000
Direct labour	2,400,000
Variable overheads	2,000,000
Fixed overheads	3,600,000

Selling and administration	Shs

costs	
Sales salaries	600,000
Sales commission (variable)	400,000
Advertising and promotion	640,000
Other costs (fixed)	960,000

The unit selling price for the company's product is shs.600.

Required

a) Draft the profit and loss statements of Pee Company using both marginal costing and absorption costing approaches.

b) Explain the difference in profits under the two methods.

END OF COMPREHENSIVE ASSIGNMENT No.4
NOW SEND TO DISTANCE LEARNING FOR MARKING

LESSON NINE

REVSION AID

CONTENTS

KASNEB SYLLABUS
MODEL ANSWERS TO REINFORCING QUESTIONS

- Lesson One
- Lesson Two
- Lesson Three
- Lesson Four
- Lesson Five
- Lesson Six
- Lesson Seven
- Lesson Eight

PAST CPA EXAMINATION PAPERS

- December 1997
- June 1997
- December 1996

- June 1996

ANSWERS TO PAST CPA EXAMINATION PAPERS

- December 1997
- June 1997
- December 1996
- June 1996

MOCK EXAMINATION

KASNEB SYLLABUS

OBJECTIVE

To develop the candidate's understanding and ability to apply costing and budgeting concepts and techniques to organizations.

SPECIFIC OBJECTIVES

A Candidate who passes this subject should be able to :

- Determine cost of various products and services
- Prepare budgets for various purposes
- Evaluate performance and make decision through analytical techniques.

CONTENT

Nature and Purpose of Cost Accounting and Budgeting

- The nature of cost accounting and budgeting
- The role of cost accounting and budgeting in business management
- The purpose of cost accounting
- Scope of cost accounting
- Relationship between cost accounting and financial accounting

Cost Classification and Estimation

- The purpose of cost classification

- Methods of cost classification: Manufacturing costs, materials, labour and overheads; Elements of non-manufacturing costs; administrative, selling and distribution costs: Behavioural classification costs: Variable versus fixed, direct versus indirect costs: Controllable versus non-controllable costs: Functional classification of costs; production , administration, selling and distribution.

- Cost estimation; purpose of cost-estimation; methods of cost estimation; high-low, account analysis, engineering, visual fit and simple linear regression analysis methods.

Cost Accumulation

- Elements of costs; material, labour and overheads
- Determination of costs in manufacturing, service and retail industries
- Ascertainment of material costs; material cost records, purchasing procedures, receipt and issues of material, methods of valuing material

issues, stock control procedures; labour costing: methods of labour remuneration, labour control procedures, maintenance of labour records; overheads: types of overheads;
- Manufacturing, distribution and administration service departmental cost allocation and apportionment, overheads analysis, overhead absorption rates, over or under absorption.

Marginal and Absorption Costing

- Distinction between marginal and absorption costing
- Valuation of products under marginal and absorption costing
- Preparation of marginal and absorption statements; cost of production and profit determination
- Reconciliation of marginal profits and absorption profits

- Applications of marginal costing: break-even analysis and charts; cost volume profit analysis and charts; special order, make or buy decisions.

Cost Accounting Systems

- The flow of costs in a business enterprise
- Alternative systems of accumulation costs; integrated versus non-integrated systems
- Selection o f a cost accounting system
- Product costing methods; specific order costing; job order costing, contract costing, batch costing; operational costing: process costing, joint products and by-products and service costing.

Budgeting and Budgetary Control

- Nature and purpose of budgets
- Preparation of budgets; master budgets, flexible and static budgets, proforma financial reports (income statements and balance sheets)
- Purpose of budgetary control.

- Operational of a budgetary control system, organization and co-ordination of the budgeting function.

Standard Costing

- Relationship between standards and budgets
- Generation of standard cost information
- Variance analysis and performance evaluation
- Accounting entries and disposition of variances

MODEL ANSWERS TO REINFORCING QUESTIONS

LESSON ONE

Answers to these questions are apparent from lesson. The student should refer to the relevant sections of lesson one for then answers.

LESSON TWO

QUESTION ONE

Any method can be used. The following solution uses the algebraic method.

Let Sh. X = Total overheads of department X

Let Sh. Y = Total overheads of department Y

Then

$X = 180 + 0.15Y$ - (1)

$Y = 240 + 0.1X$ - (2)

$X - 0.15Y = 1800$ -(3)

$-0.015X + 0.15Y = 360$ -(4)

$X(1 - 0.015) = 2160$

$X = \frac{Sh.2160}{0.985} = Sh.2192.9$

$Y = 240 + 0.1X = 240 + 219.3$

Department	A		B		C		D	
Debit Expenses	Shs 4800		Shs 5600		Shs 6800		Shs 2400	
From Department X	658	(30%)	439	(20%)	548	(25%)	329	(15%
From Department Y	524	(20%)	66	(30%)	262	(10%)	655	(25%)
Total	Shs. 5,982		Shs .6825		Shs .7610		Shs .3384	

QUESTION TWO

a)

OVERHEAD DISTRIBUTION SUMMARY
YEAR ENDING……

Expenses	Basis of	Total	Departments

	Apportionment		A	B	C
Rent, rates and insurance	Floor area	6,200	1,860	2,232	2,108
Depreciation	Plant value	2,200	1,000	900	300
Indirect labour	Direct labour hours	3,900	1,950	1,000	650
Consumable stores	Direct labour hours	900	450	300	150
Canteen	Number of employees	2,000	1,000	625	375
National Insurance	Number of employees	400	200	125	75
Repairs and maintenance	Technical estimates	1,200	540	378	282
Workers manager's salary	Technical estimates	2,600	700	1,100	300
General administration		8,000	2,500	2,000	1,500
		25,400	10,200	8,960	6,240

Direct labour hours			6,000	4,000 2,000
Overhead Absorption rate per hour			Sh. 1.70	Shs. 2.24 Shs. 3.12
Quotation for job No…			Shs	Shs
Direct materials				774.81
Direct Labour hours:	Dept. A (20 x Sh.0.05)	10.000		
	Debt. B (12 x Sh.0.45)	5.40		
	Dept. C (4 x Sh.0.4)	1.60		
				17.00
Overheads	Dept A (20 x Sh.1.70)	34.00		
	Dept. B (12 x Sh.2.24)	26.88		
	Dept C (4 x Sh.3.12)	12.48	73.36	
	Total cost			865.17
	Profit: 25%			216.2

of total cost	9
Selling Price	1,081.46

b)

QUESTION THREE

a) Reasons for Cost allocation

1. To facilitate comparison with externally provided services: It assist in assessing whether to continue the service or contact outsiders.

2. To provide ideas on the efficiency of service departments: It helps to determine whether a service department is operating efficiently and its size is optimal.

3. To discourage unnecessary service by some managers as they know they'll be charged.

4. To provide opportunity for cost price-quality trade offs: Cost allocation helps to eliminate friction between departments. This is because a user department that

demands higher quality knows that I will have to bear higher costs.

b) Methods of Allocating service costs include:

i. Direct allocation Method
ii. Step-wise Method
iii. Reciprocal Method

Direct Method

The service costs are only allocated to the production department according to the usage of the services provided.

Step-wise Method

Some of the costs of the reciprocal services will be recognized although only to some extent. The steps followed include:

- Choose one of the service departments and allocate its costs to all the other departments including the other service departments. Normally the basis of choosing that service department to start with is the service department that provides services to

the greatest number of other departments.

- Another service department is chosen and its costs allocated the remaining departments excluding the first service departments.

- Repeat the process until all the service department costs have been allocated to the production department.

Reciprocal Method

This method fully considers all reciprocal services. It is the most precise in technically finished method. This method employ, the following techniques:

- Simultaneous Equation
- Matrix Algebra

QUESTION FOUR

Both by-products and joint products may emerge from a process. The distinction usually applied is that production of the by-product is incidental to the production of the joint products. This characteristic

is usually indicated by the relative sales prices.

By Product:

Represents two or more products separated in the course of the same processing operation, usually requiring further processing, each product in such proportions that no single product can be designated as a major product.

QUESTION FIVE

Requirements of Uniform Costing:

1. Cost statements and reports should be organized and laid out in a similar format so that each element of cost and revenue can be compared quite easily.
2. Accounting periods must be the same in all firms in the industry.
3. The methods of valuing stocks and work in progress must be the same.
4. The basis of valuing fixed assets must be the same.
5. The method and actual rates of depreciation for each type of asset must be the same.
6. The basis of cost or overhead apportionment and absorption must be similar.
7. Cost classification systems must be the same in all the firms in the industry so that similar items are classified in the same names.

A company produces three joint products, Y1, Y2, and Y3. The data below reflects average monthly results:

	Y1	Y2	Y3
Monthly output (kg)	40,000	20,000	20,000
Sales Value at split off (shs.)	0	30,000	105,000
Sales Value after Split off	45,000	100,000	155,000
Costs of further processing	20,000	40,000	65,000

The joint costs were Shs.100,000

Required:

Allocate the joint cost using the three methods used to allocate joint costs.

Solution:

(i) Physical/Measurement/Unit Method:

	Y1	Y2	Y3	TOTAL
Physical Output: (Kg)	40,000	20,000	20,000	80,000

Proportion	50%	25%	25%
Joint costs allocated	50,000	25,000	25,000

(ii) Constant Gross Margin Rate Method:

Total Sales Value after slit-off:	Y1 =	45,000	
	Y2 =	100,000	
	Y3 =	155,000	
			300,000
Less: Total Costs:			
Joint Costs:		100,000	
Further Processing Costs:	Y1	20,000	
	Y2	40,000	
	Y3	65,000	(225,000)
			75,000

Costs Allocated To:	Y1	Y2	Y3	TOTAL
Sales Value:	45,000	100,000	155,000	
Less Gross Margin	(11,250)	(25,000)	(38,750)	
Total Costs	33,750	75,000	116,250	
Less Separate Costs	(20,000)	(40,000)	(65,000)	
Joint Costs Allocated :	13,750	35,000	51,250	100,000

(iii) Net Realizable Value/Method:

Net Realizable Value = Ultimate Sales Value – Separable Costs

	Y1	Y2	Y3	TOTAL
Ultimate Sales Value:	45,000	100,000	155,000	
Less: Separable Costs	(20,000)	(40,000)	(65,000)	
Net Realizable Value:	25,000	60,000	90,000	175,000
Proportion on Net Realizable Value	14%	34%	52%	
Allocation of Joint Costs:	14,000	34,000	52,000	100,000

LESSON THREE

QUESTION ONE

ABSORPTION RATE	PRODUCT A	PRODUCT B

BASED ON

a.	Unit Method	$\frac{20,000}{30,000} \times \frac{sh.240,000}{20,000}$ =sh.8/ui	$\frac{10,000}{30,000} \times \frac{sh.240,000}{20,000}$ =sh.8/un
b.	% on Material cost	$\frac{sh15}{40} \times 240,000 = 90,000$ i.esh.4.5/unitor $\frac{sh90,000}{15,000} \times 100 = 600\%$ of	$\frac{sh25}{40} \times 240,000 =$ sh.150, i.esh.15/unitor $\frac{sh150,000}{25,000} \times 100 = 600\%$ of
c.	% on Labour	$\frac{sh17.5}{40} \times 240,000 =$ sh.15 i.esh.5.25/unitor $\frac{sh105,000}{17,500} \times 100 = 600\%$ of	$\frac{sh22.5}{40} \times 240,000 =$ sh.135 i.esh.13.5/unitor $\frac{sh135,000}{22,500} \times 100 = 600\%$ of
d.	% on Prime cost	$\frac{sh32,500}{80,000} \times 240,000 =$ sh.9 i.esh.4.875/unitor $\frac{sh97,500}{32,500} \times 100 = 300\%$ of	$\frac{sh47,500}{80,000} \times 240,000 =$ sh.1 i.esh.14.25/unitor $\frac{sh142,500}{47,500} \times 100 = 300\%$ of
e.	Labour hour rate	$\frac{sh20}{40} \times 240,000 =$ sh.120, i.esh.6/unitorsh.6/labr.h	$\frac{sh20}{40} \times 240,000 =$ sh.120,0 i.esh.12/unitorsh6/lab.hr

f.	Machine hour rate	$\frac{45}{60}$ x 240,000 = sh.180,0 i.e sh.9/unit or sh.4/Machine hour $\frac{45,000}{20,000}$ = 2.25 Machine hours required for one unit	$\frac{15}{60}$ x 240,000 = sh.60,00 i.e sh.6/unit or sh.4/Machine hour $\frac{15,000}{10,000}$ = 1.5 Machine hours required for one unit

QUESTION TWO

Bonus payable to each employee

Employee A		Employee B	
Units	35	Units	60
Standard hours	2	Standard hours	3/2
	70 hours		90 hours
Actual time taken	49	Actual time taken	46
Time saved	21 hours	Time saved	44 hours
Bonus Payable		Bonus Payable	

$21 \times \frac{50}{100} \times 200$ $44 \times \frac{50}{100} \times 200$

$= 2,100$ $= 4,400$

Total Gross Wages

Overtime pay	Overtime pay
(49 – 40) $\frac{4}{3}$ x 200	(46 – 40) $\frac{4}{3}$ x 200
Gross pay	Gross pay
40 x 200 = 8,000	40 x 200 = 8,000
Total Pay	Total Pay
8,000 + 2,400 + 2,100	8,000 + 1,600 + 4,400
= 12,500	= 14,000

Wage Cost per Unit

$\frac{\text{Total wage}}{\text{Units}}$ $\frac{\text{Total wage}}{\text{Units}}$

$\frac{12,500}{35} = \text{Shs.}357.14$ $\frac{14,000}{60} = \text{Shs.}23$

QUESTION THREE

ABC CO. COST OF T506

A.

OVERHEAD APPLICATION RATE

Dept A

$$\frac{\text{Factory overhead}}{\text{Machine hours}} = \frac{600,000}{120,000} = 5$$

Rate therefore = 5 shs per machine hour

Dept B

$$\frac{\text{Factory overhead}}{\text{Direct labour cost}} = \frac{400,000}{500,000} = 80\%$$

Rate therefore = 80% of direct labour cost

B.

	Dept A	Dept B
Materials	5,000	15,000
Direct labour	4,800	4,000
Factory overheads	7,500	3,200
	17,300	22,200

Total Cost 17,300 + 22,200 = 39,500

C. Cost per unit 39,500/50 = 790 shs

D. Overhead absorbed

Dept A.	110,000 hours at shs.5	=	550,000
Dept. B.	540,000 shs labour cost x 80%	=	432,000
			982,000 shs
Overhead incurred			975,000 shs
OVER ABSORPTION FAVOURABLE			7,000 shs

QUESTION FOUR

EQUATOR GARMENTS

a) Absorption rate of cutting department

$= \frac{1,500,000}{60,000 \text{ hours}} = 25 \text{ Shs per hour}$

Absorption rate for stitching department $= \frac{1,620,000}{40,000 \text{ hours}} = 40.5 \text{ Shs per hour}$

b) Cost Statement for job at A4

Direct materials	1,250
Direct labour	
Cutting 30 hrs x 20 Shs	600
Stitching 25 shs x 10 labour hours	250
Factory overhead	
Cutting 30 x 25 hours	750
Stitching 20 x 40.5 hours	810
Total production cost	3,660
Administration cost 25%	915
Total cost	4,575
Profit mark 33.5%	1,525
Price to Customer	6,100

c) Absorption obtained

Cutting 6,800 x 25 Shs	1,700,000

Overhead incurred	1,600,000
Overhead absorbed	100,000
Stitching 17,000 x 40.5	688,500
Overhead incurred	760,000
Overhead underabsorbed	(71,500)
FACTORY TOTAL OVERABORBED	28,500

QUESTION FIVE

BOGI AND WHISPER

a)

Budget compensation	40,000,000
Other costs	24,000,000
Total costs	64,000,000
Compensation	40,000,000
Less 20% indirect salaries Considered as overhead	8,000,000
Direct salaries	32,000,000
Direct salaries/overhead cost	32,000,000
	32,000,000
Overhead rate	
Absorption on direct salaries	100%

b)

Partners 8 hours	=	1/5 x 20,000	=	4,000
Managers 8 hours	=	1/5 x 12,000	=	2,400
Seniors 51 hours	=	51/40 x 8	=	10,200
Assistants 118 hours	=	118/40 x 4,000	=	11,800
Total compensation				28,400
Plus overhead absorption rate 100%				28,400
Total cost				56,800

c) Building rate as a % of direct labour using total budget no.s

Total compensation direct labour	32,000,000
Overhead	32,000,000
	64,000,000
Profit 20% of	12,800,

total cost			000
Turnover			76,800,000
Billing rate 45% of Direct Salaries	76,800	=	240%
	32,000		

d) Data would be useful for:
Work planning
Staff control and discipline
Determining overhead absorption and relevant variances.

LESSON FOUR

QUESTION ONE

a)

Financial Accounting: This is the analysis, classification, and recording of financial transactions and the

ascertainment of how such information will be reported to the various users. It involves the development of general reporting. These statements are developed in accordance with standards imposed by the public (through the professional accounting bodies such as The Institute of Certified Public Accountants of Kenya – ICPAK and the International Accounting Standards Board IASB) as well as the requirements of the Companies Act.

Management Accounting: This is the part of accounting that provides special purposed statements and reports to management and other persons inside the organization. The information generated by management accounting is therefore for internal requirements. Management Accounting, unlike Financial Accounting is proactive i.e. it is future-oriented. It is required in making decisions that affect the organization.

Cost Accounting: It is that part of management accounting which

established budgets, standards costs and actual costs of operations, processes, departments or products. It also involves the analysis of variances from standards and profitability. In a nut-shell, cost accounting enables a business to not only fine out what various jobs or processes have cost, but also what they should have cost.

It indicates where losses are occurring before the work is finished and therefore corrective action can be undertaken.

b)

1. **General Ledger adjustment account**: It is sometimes called the cost ledger counting account. All the item extracted from the financial account are recorded in this account. The balance in this account represents the total of all the balances of the impersonal accounts extracted from the financial books. It completes the double entry in the cost accounts.

2. **Stores Ledger Control Account**: This account shows all the transaction of materials e.g. purchases, issuance of materials, returns to suppliers etc. The balance of this account represents in total the detailed balance of the stores account.
3. **Work in Progress Ledger Control Account**: It shows the total work in progress at any particular time.
4. **Finished Goods Ledger Control Account**: Receipts from production and transfer to distribution department are entered in this account and the balance of this account shows the total value of finished goods in stock.

QUESTION TWO

The following factors cause the profit shown by the cost accounting books and that shown by the financial accounting books to be different:

1. Items Shown only by one set of Accounts i.e. Items appearing in the financial accounts and not in the cost books and vice versa.

   (a) Item shown only in the financial books include:

   - Losses on disposal of assets
   - Stamp duty and other expenses on issues and transfers of capital stock (shares, bonds, debentures etc)
   - Losses on investment
   - Interest on bank loans
   - Discounts on bonds and debentures.
   - Dividends received
   - Profits arising from sale of fixed asset
   - Dividends paid

- Rent receivable but excluding that portion receivable from sub-letting part of the business premises if it has been included in the cost accounts.

(b) Items shown only in the cost books: These are normally notional charges therefore not real. They include:

- Interest on capital employed in production
- Notional rental charges of premises owned

The above two notional costs represents the opportunity cost of employing the capital in the business rather than investing it outside the business.

2. Different bases of Stock Valuation: Stocks are valued differently, in cost accounts and financial accounts; the financial stock is valued at the lower of cost and net realizable value (mark value). The valuation of stocks in cost accounts is either based on LIFO, FIFO or

weighted average. This use of different bases in valuing stocks will affect the profit/losses shown in the financial or cost accounts hence the need for reconciliation of the two

3. Different Treatment of Overheads: In cost accounts, indirect expenses are recovered as overheads based on estimated expenditure and aligned with the estimated level of production. This results in under or over-absorption of overheads and this must be taken into account when reconciling the profits of the two sets of accounts. In the financial accounts, however, indirect expenses are recorded at the actual cost and charged to the production account.

QUESTION THREE

Reconciliation of Financial and Accounting Profits as at 31 March 2004:

	Shs	Shs
Profit as per the financial books:		11,287
Add: Depreciation difference		694
Less: Items included in Financial Books but not in Costing Books:		
Profit on sale of assets:	(850)	
Dividend received	(2,635)	
Less: Stock: Opening Stock	(3,250)	
Closing Stocks	(2,010)	
	(532)	(9,277)
Profit as per cost accounting books:		2,704

QUESTION FOUR

Reconciliation of the Costing and Financial Accounting Profits:

		Shs	Shs
Profit as per cost accounts			20,496
Add: Items not credited to cost accounting:			
Dividends and interests:		552	
Stock difference: Finished Goods:		386	938
Less: Items not credited			
Loss on sale of machine		1,750	
Stock Differences:	Raw Material		
		438	
Opening stock			
	Raw Material		
		355	
Closing Stock			
		299	(2,842)
Finished Goods			
Profit as per financial Accounts			18,592

QUESTION FIVE

Memorandum Reconciliation Account

		Profits as Per Cost Books	114,000
Items not Debited in Cost A/Cs		**Items not Credited in Cost A/Cs**	
Stock Differences: Opening Stocks		Dividends Received	3,000
Of Raw Materials	1,000	Interest Received	1,000
Loss on Sale of Plant	1,000	**Differences in Stocks:**	
Fines	1,000	W.I.P. (Opening Stocks)	2,000
Interest on Mortgage	2,000	Opening Finished Goods	3,000
Selling Expenses	15,000	W.I.P: Closing stocks	1,000
Salesman	18,		10,

Commission	000		000
Distribution Expenses	13,000		
Stock Differences:			
Raw Materials: Closing	1,000		
Finished Goods: Closing	2,000		
Net Profit as Per the Financial Books:	70,000		
	124,000		124,000

Workings

	Financial A/Cs	Cost A/Cs	Differences
Work in Progress:	29,000	21,000	2,000
Opening Stocks:			
Finished	20,000	23,00	3,000

Goods:		0	
Opening Stocks:			
Raw Materials: Opening Stocks:	27,000	26,000	1,000
Closing Stocks:			
Work in Progress:	21,000	20,000	1,000
Finished Goods:	22,000	24,000	2,000
Raw Materials:	29,000	30,000	1,000

LESSON FIVE

QUESTION ONE

PERMA

a)

Selling price per unit		66
Less variable cost production	44	
Less variable cost selling	4	48
Contribution		18
Fixed cost production	200,000	
Sales	99,000	
	299,999 shs	

Therefore, Breakeven in shillings

$$\frac{\text{Total Fixed Cost}}{\text{Contribution/Sales ratio}}$$

= 299,000 x 11/3

= 1,096,33 shs

b) Therefore, to earn profit of 195,000

299,000 + 195,000 x 11/3 = 1,811,333 shs

Therefore, Sales units = 1,811,333 = 27,444 units
66

c)

Fixed production cost = 240,000
200,000 + 20%
Variable production cost 30.8 shs.
44 – 30% Per unit
Therefore Breakeven = 717,115 shs
sales = $\frac{339,000}{1} \times \frac{11}{5.2}$

d) Effectiveness use of breakeven analysis demands an appreciation of the limitation consequent on the basic assumption of breakeven analysis.

1. Selling prices will remain constant whatever the level of sales activity.
2. All costs may be categorized into fixed or variable.
3. Total fixed costs are constant irrespective of the level of activity.

4. Variable costs per unit are constant.
5. Stock levels of finished goods and work in progress remain constant.

QUESTION TWO
a)

Note
There is reciprocal servicing by the service department. Therefore the Direct Method of Cost Re-apportionment is not applicable only the continuous allotment (Repeated distribution) or the simultaneous (Algebraic) method could be used.

Let C be total canteen costs
B be total boiler house costs

Then
C = 50,000 + 0.2 B ..... Eq (i)
B = 100,000 + 0.1 C ..... Eq (ii)

↓

B = 100,000 + 0.1 C

B = 100,000 + 0.1 (50,000 + 0.2B)

B = 105,000 + 0.02B

0.98B = 105,000
B = 107,143
C = 71,249

To solve use the two equations, use any acceptable method of solving simultaneous equations to get

B = 107,143
C = 71,249

Cost Statement for the Four Production Departments:

Production Department	**Service Department:**				
	Canteen		**Boiler**		**Total Cost**
	%	**Shs**	**%**	**Shs**	**shs**
1: 200,000	10	7,143	20	21,429	228,572
2: 500,000	30	21,428	10	10,715	532,143
3: 300,000	20	14,286	30	32,143	346,429
4: 400,000	30	21,428	20	21,428	442,856

		64,285		85,715	1,550,000

b) Cost – Re-apportionment has the following problems:

(i) Choice of the appropriate re-apportionment method.

(ii) Choice of the appropriate i.e. apportionment base: whether to use budgeted or actual costs.

(iii) Complications arise of the service departments are reciprocating in their services.

QUESTION THREE

NB:

The limitations of break-even analysis stem from its assumption.

(i) Fixed costs are not always fixed. After activity level reaches a certain

critical stage, they may increase as in the case of stepped cost functions.

(ii) Variable costs are not constant. They will be decreasing or increasing economies of scale as activity levels change.

(iii) All costs cannot be strictly classified into their fixed and variable components some costs are semi-variable.

(iv) Volume is not the only factor that affects costs behaviour. Other factors such as sales mix and technology or productive method also matter.

(v) Sales price per unit usually decreases as the sales volume increases due to the effect of quantity discounts.

(vi) Inventory changes are not always insignificant especially in cases of fluctuating demand.

(vii) Managerial attitudes, policies and techniques affect costs.

(viii) Production methods change every time.

(ix) Sales mix also changes over time.

(x) Market conditions are not constant. They are dynamic.

(xi) The relationship between costs and volume is not always direct because of the effect of labour productivity e.g. learning curve effect.

QUESTION FOUR

a)

(i) **Break-even charts:** Are graphical representation of the relationship between costs and volume as well as the profit or loss at any sales volume within a relevant range.

(ii) **Variable cost ratio**: Also called the contribution margin ratio.
It is the ratio of the variable costs to the sales or the proportion of variable costs in the sales. It is computed as:

$$\frac{\text{Variable Costs}}{\text{Sales Price}} \times 100$$

(iii) **Margin of Safety:** Is the excess of sales over the break-even sales. It shows by how much sales will have to decrease before the company can make a loss.

(iv) **Profit Volume Ratio**: Also called the marginal income ratio
It is the ratio of contribution margin to sales. It is computed as:

$$\frac{\text{Sales} - \text{Variable Costs}}{\text{Sales}} \times 100\% \quad \text{or} \quad \frac{\text{Contribution Margin}}{\text{Sales}} \times 100\%$$

OR (1 – Variable Cost Ratio) x 100%

b)
(i)

$$\text{Break-even Point (Units)} = \frac{\text{Fixed Costs}}{\text{Contribution per Unit}} = \text{Shs}\frac{(17,000 + 11,000 + 2,000 + 6,000)}{10 - \left(\frac{24,000}{6,000}\right)}$$

$$= \frac{\text{Shs.}36,000}{6} = 6,000 \text{ units}$$

Break-even Point (Sales) = 6,000 x 10 = Shs.60,000

(ii) Cash flow break-even point =

$$\frac{\text{Cash Expenses}}{\text{Contribution Per Unit}}$$

$$= \frac{\text{Fixed Cost} - \text{Non-Cash Expense}}{\text{Contribution Per Unit}}$$

$$= \frac{\text{Shs.}36,000 - 6,000 \text{ (Depreciation)}}{6}$$

$$= \frac{\text{Shs.}36,000}{\text{Shs.}6} = 5,000 \text{ Units}$$

BEP in Sales = 5,000 x 10 = Shs.50,000

QUESTION FIVE

Depreciation tax shield is the amount by which an organization's tax liability decreases because of the reduction of taxable income by the depreciation expenses. Its importance in BEP analysis is that when the depreciation is included in a tax environment, the company's actual break-even point (computed from cash fixed costs) is lower than the computed break-even points (computed from total fixed costs). It is important to note that the depreciation tax shield lowers the cash BEP than the cash BEP if there were no Tax!

Depreciation Tax Shield = Depreciation Change x Tax Rate

Using a tax rate of 48%

The cash BEP in Q4 is now, computed as follows:

	Shs
Cash Flow Fixed Costs:	30,000
Less: Tax Shield on	

non-cash Depreciation Expenses: 48% x 6,000:	2,880
	27,120
Cash BEP Units Shs. 27,120	= 4,520 units
Shs.6 Cash BEP Sales = 4,520 x 10	= Shs.45,200

Observation:
The BEP without taxes is 5,000 units or Shs.50,000 With tax consideration, the BEP drops to 4,520 units or shs45,200. Therefore, the tax shield provided can be lowered by 480 units or Shs4,800

LESSON SIX

QUESTION ONE

a. Six O.A.Rs

(i) Labour hour = $\frac{\text{Production overhead}}{\text{Labour hours}}$

= $\frac{\text{shs.300,000}}{25,000}$

= Shs.12 per hour

(ii) Machine hour = $\frac{\text{Production overhead}}{\text{Machine hours}}$

= $\frac{\text{shs.300,000}}{15,000}$

= Shs.20 per hour

(iii) Percentage of direct materials = $\frac{\text{Production overheads}}{\text{Direct Materials}} \times 100\%$

= $\frac{\text{Shs.300,000}}{\text{Sh.100,000}} \times 100\%$

= 300%

(iv) Percentage of direct wages = $\frac{\text{Production overheads}}{\text{Direct Wages}} \times 100\%$

= $\frac{\text{Shs.300,000}}{50,000} \times 100\%$

= 600%

(v) Percentage of prime cost = $\frac{\text{Production overheads}}{\text{Prime Cost}} \times 1$

= $\frac{\text{Shs.300,000}}{150,000} \times 100\%$

200%

(vi) Per job (i.e. unit) = $\frac{\text{Production overheads}}{\text{No. of jobs}} \times 1$

= $\frac{\text{Shs.}300,000}{300}$

Shs.1,000 per job

b. Comments on O.A.R.s

(i) and (ii) in the time based methods are generally considered to be the most equitable as most overheads relate to time. Because of increasingly mechanization/automation, machine hour rates are likely to be the most relevant in the future.

(iii) Only suitable if all jobs are made from the same materials otherwise absurd results will occur.

(iv) Simple to operate and where similar rates are paid it produces similar results to the labour hour method. Can produce anomalies where people earning different rates work on jobs.

(v) This is a combination of the wages and materials rates so includes their anomalies.

(vi) If all jobs (units) are the same then this is the best method. If they are different, as is likely then, this is the worst method as equal overheads will be charged to unequal jobs.

c. Job A57 - COST ESTIMATES USING DIFFERENT O.A.R.S.

	Labour hour OAR	**Machine hour OAR**	**Percentage of Materials**	**Percentage of Wages**	**Percentage of Prime Cost**	**Per Job**
Prime Cost	Shs 450	Shs 450	Shs 450	Shs 450	Shs 450	Shs 450
Overhead	960	1,000	750	1,200	900	1,000
Total	1,4	1,450	1,200	1,65	1,35	1,4

Cost	10			0	0	50

QUESTION TWO

MAJENGO BUILDERS
CONTRACT A/c

Direct wages		240,000	Materials returned to stores	2,500
Accrued wages		10,000	Materials on site	27,500
Materials issued		275,000	Cost of work c/d uncertified	50,000
Plant & Equipment			Cost of work certified	700,000
1st June	150,000			
Plant and Equipment 30th November	100,000			
Depreciation		50,		

	000	
Installation costs	125,000	
Payment for direct expenses	75,000	
Direct expenses accrued	5,000	
	780,000	780,000

Turnover Calculation for Contract Profit/Loss A/c

Estimated profit value certified – cost of work certified = 800,000 – 700,000 = 100,000

Assumption

Attributable profit if management cannot foresee final result, then zero profit must be taken. Accounting entries are then

based on cost of work certified = turnover i.e. 700,000

Contract Profit/Loss Account

Cost of work certified	700,000	Turnover therefore	700,000

Contractee Account

To turnover	700,000	Cash received	750,000
Balance c/f	50,000		
	750,000		750,000

Work in progress = Dr. 50,000
cost of work not certified

This is offset in the balance sheet

By credit on contractee a/c = Cr
50,000 cash received in excess of
turnover

Balance sheet total = NIL

QUESTION THREE

OCEANIC CONSTRUCTION

CONTRACT ACCOUNT

	Shs '000's		Shs '000's
Materials Bal brought down	900	Defective materials	350
Direct wages	4,800	Materials c/d	2,600
Direct expenses	6,400	Cost c/d	51,000
Depreciation	800		
Materials purchased	37,650		
Machine installation & service	2,400		
Wages accrued	400		
Accrued expenses	600		
	53,950		53,950
		Cost of work not certified	24,000

Cost of work b/d	51,000	Cost of work certified to P/L A/C	27,000
Materials c/d	2,600	Accrued expenses	600
		Accrued wages	400

Therefore, estimated profit certified value	400,000
Less cost of certified work	27,000
	13,000

ASSUMING NO FORESEEBALE LOSSES

Large profit expected
Value of contract – total expected cost
180,000 – 125,000 = 55,000

Therefore, profit ratio 40 to 24

Therefore, 40/64 = 5/8 = ratio work certified

To work certified i.e. 5/8 to 3/8

Therefore, $\frac{13,000}{8} \times \frac{5}{1} = 8,125 =$ Attributable profi

Turnover = 27,000 + 8,125 = 35,125

CONTRACTEE ACCOUNT

	Shs		*Shs*
Turnover	35,125	Cash received	38,000
Balance c/d	2,875		

STOCKS

Contract work in Progress Balance Sheet Extract

	Shs
Cost of work not certified	24,000
Less credit balance on Contractee account	2,875
	21,125

QUESTION FOUR

DELUX PAINTS LTD

PROCESS 1

Dr					Cr
	Litres	Shs		Litres	Shs
Raw	20,00	1,000	Normal	2,00	30,0

Material input	0	,000	loss	0	00
Added cost			Abnormal loss	2,000	220,000
Material		460,000	Output to process 2	16,000	1,760,000
Labour		385,000			
overhead		165,000			
	20,000	2,010,000		20,000	2,010,000

Evaluation $\frac{2,010,000}{18000} - \text{Scrap value} = 1$

$= 1$

PROCESS 2

Dr					Cr
	Litres	Shs		Litres	Shs
Input from process 2	16,000	1,760,000	Normal loss	800	27,200

Added cost			Abnormal loss	200	29,600
Material		368,500	Transfer to F.G	13,000	2,275,000
Labour		304,500	Work in Progress	2,000	312,400
		211,200			
Overhead	16,000	2,644,200		16,000	2,644,200

STATEMENT OF EQUIVALENT UNITS

	Units	**Input material**	**Material**	**Labour**	**Overheads**
Abnormal loss	200	200	140	100	80
Closing W.I.P	2,000	2,000	1,600	1,400	1,000
Transfer to F.G	13,000	13,000	13,000	13,000	13,000
Total equiv.		15,200	14,740	14,500	14,080

Units					
Total cost		1,760,000	368,500	304,500	211,200
Less normal scrap		27,200			
		1,732,800			
Cost per equiv.	175	114	25	21	15
Units complete					
Output to:					
Finished goods	2,275,000	1,482,000	325,000	273,000	195,000
W.I.P	312,400	228,000	40,000	29,400	15,000
Abnormal losses	29,600	22,800	3,500	2,100	1,200

QUESTION FIVE

COMPANY XYZ
PROCESS 3 ACCOUNT

Dr	Units	Shs		Units	Cr Shs
W.I.P A/c			Scrap A/c normal		
Process 2	10,000	300,000	Loss	200	6,000
Materials		230,400	Abnormal loss a/c	600	43,600
Labour		105,600	Finished goods	7,200	525,120
Overhead		50,400	Closing stock	2,000	111,520
	10,000	686,400		10,000	686,400

STATEMENT OF EQUIVALENT UNITS

	TOTAL	% co	Mat 2	% co	Mat 3	% co	Labour	% co	O/H

		mp	prod Eq Units	mp	prod Eq Units	mp	comp t	mp	Eq units
Finished Goods	7,200	100	7,200	100	7,200	100	7,200	100	7,200
Normal loss	200	-	-	-	-	-	-	-	-
Abnormal Loss	600	100	600	100	600	100	600	100	600
Closing Stock	2,000	100	2,000	60	1,200	60	1,200	60	1,200
1.	10,000		9,800		9,000		9,000		9,000
Statement of cost shs.			300,000						
Less scrap value			6,000						

2	Cost	294,000	230,400	105,600	50,400
	Shs per equiv. Unit 2÷1	30	25.60	11.73	5.6

Total value	Multiplied by Total Equivalent units				
525,120	Finished Goods	216,000	184,320	84,480	40,320
43,760	Abnormal Loss	18,000	15,360	7,040	3,360
111,520	Closing Stock	60,000	30,720	14,080	6,720

Therefore, cost of completed units = 525,120, abnormal loss 43,760

Abnormal Loss

Units	Shs	Units	shs

Process 3	600	43,760	Scrap a/c		
			Abnormal loss	600	18,000
			P/L A/C		25,760
	600	43,760			43,760

LESSON SEVEN

QUESTION ONE

CASH BUDGET

	July	Aug	Sep	Oct	Nov	Dec	T
	Shs‘000’	Shs‘000’	Shs‘000’	Shs‘000’	Shs‘000’	Shs‘000’	S‘0
Receipts sales	210	200	200	200	200	200	
New issues/capital	-	-	-	30	-	-	

Payments							
Expenses and purchases	160	150	150	150	150	150	91
Expenses and purchases	24	24	24	24	24	24	14
Plant	12	25	13	-	50	-	10
Stock	-	20	-	-	-	-	2
Tax	-	-	-	-	-	30	3
Dividends	-	24	-	-	-	-	2
	196	243	187	174	224	204	122
Surplus/(deficiency)	14	(43)	13	56	(24)	(4)	1
Opening balance	40	54	11	24	80	56	5
Closing balance	54	11	24	80	56	52	6

QUESTION TWO

PRODUCTION BUDGET

S LTD

	Product A	Product C	Product E
Units	**'000'**	**'000'**	**'000'**
Sales	140	190	420
Stock increase/(decrease)	(5)	2	(40)
Production required	135	192	380
Add: Excess cover normal			
Loss	15	48	20
Production budget	150	240	400

Notes:

(i) Sales units = Budgeted Sales Value

Expected Selling Price

Expected Selling Price = Expected unit Cost + Expected

i.e. Product A = Shs24 x $\frac{100}{80}$ = Shs30

Product C = Shs15 x $\frac{100}{75}$ = Shs20

Product E = Shs20 x $\frac{100}{83\frac{1}{3}}$

QUESTION THREE

Stock units = Budgeted Stock Values
= Expected Unit Cost

(b) Direct wages Budget

Product A		A	C	E
Department F Grade 1 (hrs)		150	360	200
Grade 2 (hrs)		187.3	240	300
Depart 6 Grade 1 hrs		225	120	200
Grade 2 hrs		150	180	480
	Rate Shs	**A**	**C**	**E**
Department F Grade 1	1.80	Shs270	Shs648	Shs360

(hrs)

Grade 2 hours	1.60	Shs2 99.2	Shs 384	Shs 480
Depart 6 Grade 1	2.00	Shs4 50	Shs 240	Shs 400
Grade 2	1.80	Shs2 70	Shs 324	Shs 864

QUESTION FOUR

(a)

- Coordination
- Effective Communication
- Control
- Motivation
- Responsibilities and authority classification
- Planning

(b) Workings for Stop Over Industries

(i) Budgeted purchases

		Units
	Closing stocks	1700
Add:	Sales	10,000
		11,700
Less:		1,3

Opening stocks	00
Budgeted purchases	10,400

(ii) Budgeted debtors

Debtors during the period

Expected credit sales	4,860,000
Less: Expected cash receipts	1,960,000
Outstanding amounts	2,900,000
Add: Opening debtors	700,000
Budgeted debtors	3,600,000

(iii) Cash Budgets

	Shs November
Balance b/f	840,000
Receipts	1,960,000
Collection from customers	4,700,000
	7,500,00
Payments	
Disbursements	1,740,000
Surplus (deficit)	5,760,000

(i) Budgeted Profit and Loss Account

Budgeted Sales (WI)	2,640,000
Less: Cost of sales (WII)	(1,650,000)
Gross Profit	990,000

Workings II

(ii) Sales units (Total) = 198,000

1st quarter	2nd	3rd	4th
x	2x	x	2x = 6x

6x = 198,000 x = 33,000

Therefore; 33,000 x 80 = 2,640,000

33,000 x 50 = 1,650,000

(iii) Sales Collection Schedule

	Jan	Feb	March	Total
Sales (units)	11,000	11,000	11,000,	33,000
Cash Sales (shs) (20%)	176,000	176,000	176,000	528,000
Credit sales (shs) (80%)	704,000	704,000	704,000	2,112,000
Collections				
1st month	-	422,400,	422,400,	844,800
2nd month	_.	_.	281,600	281,600
Total cash collected	176,000,	598,400	880,000,	1,054,400

Cash Collection Schedule

	Jan (Shs)	Feb (Shs)	March (Shs)	Total (Shs)

Opening bal b/d	50,000	219,875*[1]	0	50,000
Add:				
Receipts				
(Inwards – Outwards)	176,000	598,400	880,000	1,654,400
Bank o/d (Balancing Figure)	291,000	——— .		
	517,000	815,275		
Payments				
Materials (WIII)	198,000	198,000	396,000	792,000
Labour + other expenses (WIII)	319,000	319,000	319,000	957,000
Bank o/d interest	-	727 5	5422 *[2]	
	517,000	524,275	76,922	

	0	291,000		
Closing balance c/f	0	0	0	

$*_1$ = 30% x $\frac{29100}{12}$ $*_2$

= 216875 x (30% x $\frac{1}{12}$)

(WII) Material Purchases

	Jan	Feb	March
Materials required (unit)	11,000,	11,000	11,000
Shs/Unit	18	18	18
Value	198,000	198,000	198,000
Payment (1 month in advance)	198,000	198,000	396,000 *$_3$

*$_3$ = 22,000 x 18

(WIII) Other expenses – All cash item expenses

	Jan	Feb	March

Labour (10 x 11,000)	110,000	110,000	110,000
Salaries (6 x 11,000)	66,000	66,000	66,000
Rent (5 x 11000)	55000	66000	66000
Factory overhead (8 x 11000)	880 00	880 00	- .
Total expenses	319000	319000	319000

- Depreciation is a non-cash item and therefore excluded.
- Materials purchases payment for March refer to production in April 92nd quarter 1st month) = 22,000 units.
- It is assumed that interest on overdraft is payable within one month.

Interest on overdraft = 291,000 x 30% x $\frac{1}{12}$ = 72,750

QUESTION FIVE

(a) The principal budget factor is a factor which will limit the activities of an undertaking and which is often the starting point in budget preparations. In most businesses, it is the volume of demand for the products, which limits the scale of operation.

(b) Essentials of effective budgeting system.

- Key executive are committed to the proposed system.
- The long-term objectives of the organization are defined.
- Adequate foundation of data.
- An organization chart is drawn up.
- A budget committee is set up and a budget manual produced.
- The budget period is set.

LESSON EIGHT

QUESTION ONE

BIDII COMPANY

A = ADVERSE

F = FAVOURABLE

	ACTUAL PRICE	PRICE VARIANCE ADJUSTMENT		ACTUAL COST	USAG VARIA ADJUS NT
		A	F		A
MATERIAL X	323,000	-	17,000	340,000	10,000
MATERIAL Y	312,000	52,000	-	260,000	-
DIRECT LABOUR	433,500	25,500	-	408,000	-
PRODUCTION OVERHEADS:					
Variable	340,000	10,000			

Fixed	220,000	Nil		
TOTALS	1,628,500	87,500	17,000	10 0

VARIANCE SUMMARY:

Adverse	Favourable
87,500	17,000
10,000	47,000
97,500	64,000

NET VARIANCE	(33,500) Adverse

QUESTION TWO

MAPUTO

	Actual cost Shs from question	Price variance rate	Actual usage at STD price	Usage/ efficiency	STD dowd good output STD cost x 64,000
MAT A	780,000	48,000 ADV	776,000	8,000 ADV	768,000
			194,000 kg x 4 Sh		
MAT B	625,000	25,000 FAV	650,000	10,000 ADV	640,000
			130,000 Lt x 5 Sh		
Labour	684,000	16,000 FAV	700,000	60,000 ADV	640,000
			35,000 Hrs x 20		

			Sh		
Variable overhead	384,000	96,000 FAV	480,000	19,200 ADV	460,800
			60,000 M/C Hrs x 8 Sh		
Fixed overhead	250,000	10,000 ADV	240,000	9,600 ADV	230,400
			60,000 M/C Hrs x 4 Sh		
	2,723,800	122200FAV	2,846,000	106800 ADV	2,739,200

QUESTION THREE

a)

BEAUTY PRODUCTS

BUDGETED PROFIT ANDLOS AT THE ACTIVITY LEVEL ACHIEVED

	Shs	Shs
Sales 750 packages @365 Sh each		
Production costs variable	$\frac{214,500}{1,000} \times \frac{750}{1}$	160,875
Gross profit		112,875
Packaging Cost 750 @ 15 Sh	11,250	
Administration cost fixed	45,000	56,250
FLEXED BUDGET AT 75% ACTIVITY		56,625

b) Sales volume drop impacted profit unfavourably

Budgeted contribution 365,000 – 214,500 – 15,000 = 135,500

Actual contribution (75/100) x 135,500 = 101,625 – 135,500

= 33,875 (contribution variance adverse)

Or at standard profit level (90,500/100) x (25/1) = 22,625 Adverse

Sales Price Adverse 3,750 but this may have been the result of weak market demand.

Overheads

Price and usage variance are not attributable to sales volume directly although smaller batch size may have affected purchase price and factory usage efficiency. This relates to all expense but primarily the variable items.

Administrative costs fixed at 45,000 are under absorbed due to the sales shortfall thus (45,000/100) x (75/1) has been absorbed leaving (45,000/100) x (25/1) = 11,250 as capacity variance. This is revealed in the calculations given above for volume variance and is the difference between volume variance in

contribution terms and the volume variance at standard profit level.

QUESTION FOUR

Variance Calculations:

Material Variance

Actual cost for actual issues: -	Shs.107,800		
$\left(\frac{\text{Shs.}126,000}{\text{Shs.}180,000} \times 154,000\right)$		Direct material Price Variance	Direct Material Cost Variance =
STANDARD COST for actual issues: -	Shs.115,500	Shs.7,700 (FAV)	

(154,000 x Shs.0.75 per Kg)		Direct Material Usage Variance	Shs.6,200 (FAV)
STANDARD COST for STANDARD QUANTITY:- (Shs.0.75 x 38,000 x 4 Kg)	Shs.114,000	Shs.1,500 (ADV)	

Labour Variances

Actual rates for actual hours:-	Shs.136,500	Direct Labour Rate Variance	Direct Wages Cost
		Shs.11,7	

		00 (ADV)	
STANDARD RATES for Actual hours: - (shs.1.60 hour x 78,000)	Shs.124,800	Direct Labour Efficiency	Shs.14,900 (ADV)
STANDARD RATES for STANDARD HOURS: - (Shs.1.60 x 38,000 x 2)	Shs.121,600	Variance	Shs.3,200 (ADV)

QUESTION FIVE

MARIDADI PEOPLE LTD:

Material price usage A = ADVERSE

Labour F = FAVOURABLE

Variance

Fixed factory overhead;

ACTUAL COST		ACTUAL USAGE		GOODS OUTP	
		INVENTORY	VARIANCE	STD COSTS	VARIAN AT STC
Raw Material	784,000	10,000	184,000 A	600,000	50,000 F
Labour	997,500		97,500 A	900,000	120,000 A
Variable overhead	320,800		20,800 A	300,000	40,000 A
Fixed overhead	441,700		38,300 F	480,000	64,000 A

A.

(i) Material Price 84,000 A
Usage 50,000 F

(ii) Labour rate 97,500 A
Efficiency
120,000 A

(iii) Variance Factory O/H 60,000 A

(iv) Fixed Factory O/H 25,700 A

(v) SALES PRICE VARIANCE

1,100 X 200	SHS
2,200,000 –	=
2,365,000	165,00
	0 F

SALES MARGIN VARIANCE 50
Units x 700 = Shs.105,000 A

B.

ACTUAL RESULTS:				VARIANCE RESULTS:		STAND D
					Units	
SALES	110,000 units		2,365,000	(135,000) A	1,250	2,500,
Material		684,000		(34,000) A	650,000	
Labour		997,500		(217,500) A	780,000	
O/H 's Variable		320,800		(60,800) A	260,000	
Fixed		441,700		(25,700) A	416,000	
			2,444,000			2,106,
Less C/Stock			324,000			324,

			2,120,000			1,
Net Profit			245,000	473,000		

Cost Variance = Shs.38,000

A significant overspend 2,106,000 Vs 2,444,000. Approximately 15% in product cost, which must be investigated.

C. As most variances reflect situations that impact a business in various ways, it is advisable to fully appreciate the full impact such situations are having on all aspects of the business. For example, a favourable variance for material may result in an adverse usage variance because the low price may have resulted in buying poor quality.

KASNEB PAST PAPER QUESTIONS

KENYA ACCOUNTANTS AND SECRETARIES NATIONAL EXAMINATIONS BOARD

CPA PART 2
COST ACCOUNTING
Tuesday: 2 December 1997
Time Allowed: 3 hours

Answer FOUR questions in SECTION 1 and ONE question in SECTTION II. Marks allocated to each questions are shown at the end of the question. Show all your workings.

SECTION I

QUESTION ONE

Nacomi Limited manufactures one product. The following information was extracted for the month of October 1997:

Production in units	5,000
	Sh
Actual cost of direct materials purchased	5,712,000
Actual direct wages	4,080,0

paid	00
Variable overheads incurred	630,000
Fixed overheads incurred	4,800,000
The variances from standard costs were:	
	Sh
Direct material usage variance	144,000 F
Direct material price variance	272,000 A
Direct wages efficiency variance	112,000 A
Direct wages rate variance	120,000 F
Variable overhead expenditure variance	46,000 A
Fixed overhead volume variance	232,000 F
Fixed overhead expenditure variance	360,000 A

F indicates a favourable variance while A indicates an adverse variance.

Other information:

1. The company used only one grade of direct material. Direct materials are purchased in kilograms. Throughout the month, the actual price paid was Sh.8.00 above the standard price per kilogram. The standard material cost of the product is Sh.720 per unit.
2. The company employs only one grade of direct labour. During the month, the actual wage rate paid was Sh.68.00 per hour. Three standard hours are required to produce one unit.
3. Fixed and variable overhead absorption rates are based upon standard hours produced.
4. There were no stocks of materials, work-in-progress or finished goods held at either the beginning or end of the month. There were no process losses

Required:

Calculate for the month of October 1997:
a) The actual quantity of direct material consumed, in kilogrammes (5 marks)
b) The actual price, per kilogramme paid for the material. (5 marks)

c) The actual direct labour hours worked (5 marks)

d) The direct labour hours worked in excess of standard (5 marks)

(Total: 20 marks)

QUESTION TWO

a) Explain the distinction between joint products and by-products. (4 marks)

b) Plastico Limited makes plastic bottles through two processes, moulding and finishing. Each bottle takes 1.5 kilogrammes of plastic material. The manufacturing design involves an estimated 5% loss on input in the moulding process but no loss is expected in the finishing process.

The following results are available for the year ended 31 October 1997:

Input of plastic	7,500 Kg

materials	
Output of moulded bottles	4,750 bottles
Output of finished bottles	4,600 bottles
Cost of plastic materials	Sh.4.00 per Kg
Moulding costs	Sh.24.00 per bottle
Finishing costs	Sh.16.00 per bottle

Required

i) Process accounts for moulding and finishing showing clearly the normal and abnormal losses.
(16 marks)

(Total: 20 marks)

QUESTION THREE

Kazuri Construction Limited is building an extension to a large supermarket in Nairobi. Work on the extension commenced on 1 July 1996.

The information given below relates to the year ended 30 June 1997:

	Sh.
Plant sent to site	4,000,000
Direct materials received at site	18,400,000
Direct wages incurred	14,000,000
Direct expenses incurred	1,800,000
Hire of crane	1,600,000
Indirect labour costs	2,800,000
Supervision salaries	1,680,000
Consultancy fees	320,000
Service costs	720,000
Hire of machinery	800,000
Overhead incurred	2,400,0

on site	00
Head office expenses apportioned to contract	2,800,000
Cash received from contractee	40,000,000
On 30 June 1997:	
Value of plant on site	3,000,000
Value of work certified	50,000,000
Cost of work not certified	10,000,000
Wages accrued	1,200,000
Service costs accrued	80,000
Materials unused on site	1,600,000

Required

The contract account for the year ended 30 June 1997 **(Total: 20 marks)**

QUESTION FOUR

a) Give sound reasons why it is necessary for a business concern to prepare a budget. (6 marks)

b) A wholesaling company had the following data for the month of November 1997:

Stocks	1 November 1997	1,300 units
		Sh.
Balance of debtors	1 November 1997	700,000
Cash balance	1 November 1997	840,000
Expected credit sales		4,860,000
Expected cash receipts		1,960,000
Minimum cash balance	30 November 1997	Sh.100,000

Stocks balance	30 November 1997	1,700 units
Expected sales		10,000 units
Expected collections from customers		Sh.4,700,000
Expected cash disbursements		Sh. 1,740,000

Required

i) Budgeted purchases (4 marks)
ii) Budgeted debtors (4 marks)
iii) Cash budget (6 marks)

(Total: 20 marks)

QUESTION FIVE

a) Explain the factors to be taken into account when choosing an overhead

absorption method.

(6 marks)

b) The Reta manufacturing company provided the following data for its operations for 1997:

Standard costs per product unit:	Sh.
Direct material	60.00
Direct labour	80.00
Variable overheads	20.00
Fixed overheads	40.00
	200.00
	Units
Beginning stock	20,000
Production	180,000
Closing stock	40,000
Sales	160,000
Selling and administrative expenses:	Sh
Variable	4,000,000
Fixed	2,000,

	000
Selling price per unit	300.00

Required

a) Prepare the profit and loss statement using:

i) Absorption – costing method (5 marks)

ii) Direct – costing method (5 marks)

b) A reconciliation of profit/loss figures obtained in (a) above (4 marks)

(Total: 20 marks)

SECTION II

QUESTION SIX

List and explain the factors, which should be considered when setting the standard labour cost of a product

(Total: 20 marks)

QUESTION SEVEN

a) Write explanatory notes on the following:

i) Profit center and cost center (5 marks)

ii) Product costs and period costs (5 marks)

b) Explain how management decision influence cost behaviour (10 marks)

(Total: 20 marks)

KENYA ACCOUNTANTS AND SECRETARIES NATIONAL EXAMINATIONS BOARD
CPA PART 2
COST ACCOUNTING

Tuesday: 6 June 1997
Time Allowed: 3 hours

Answer FOUR questions in SECTION 1 and ONE question in SECTTION II. Marks allocated to each questions are shown at the end of the question. Show all your workings.

SECTION I

QUESTION ONE

a) BCD Ltd manufactures office and household furniture to customers specifications. Because of the specialized nature of the manufacturing process, each job is treated separately for costing purposes. There are two stages in the manufacture of each item namely,

assembly and finishing. In the assembly department, overheads are absorbed on the basis of prime cost incurred in that department. In the finishing department, overheads are applied on the basis of total accumulated cost on the job in both stages inclusive of overhead absorbed in assembly.

The selling price of the item is then determined by applying the usual 40% profit margin.

The following information is provided about budgeted data for the next financial period:

	Assembly	Finishing
Materials	Sh.480,000	Sh.300,000
Overheads	Sh.594,000	Sh.418,500
Labour cost	Sh.180,000	Sh.120,000
Labour hours	3000	1500

Required

Calculate the overhead absorption rates for each production process.
(6 marks)

b) Job No.148 shows the following data concerning its production:

	Assembly	Finishing
Materials	Sh. 5,000	Sh. 3,500
Labour cost	Sh. 2,700	Sh.1,600
Labour hours	12	4

Required

Prepare the cost statement for this job and indicate the proposed final selling price

(6 marks)

c) The following data relates to actual manufacturing operations as

accumulated for the whole financial period.

	Assembly	Finishing
Overhead incurred	Sh.660,000	Sh.450,000
Materials	Sh. 530,000	Sh.288,000
Labour cost	Sh.200,000	Sh.135,000

QUESTION TWO

a) Explain the concept of equivalent units and its significance in process costing.

(5 marks)

b) XYZ Ltd. manufactures an alcoholic beverage that passes through two processes – A and B. In the latest production period, 12,000 units were transferred from process A to process B at a total cost of Sh.450,000.

During the period, additional processing costs were incurred consisting of:

Direct materials -	Sh.345,600
Direct Labour -	Sh.158,400
Manufacturing overheads -	Sh.75,600

During the same period 8,640 units were completed and transferred to the finished goods warehouse. A stock take at the end of the period showed that 2,400 units were in stock and were 60% complete in respect of all inputs.

The normal processing loss is estimated at 5% and since this arises mainly through evaporation, there are no salvage proceeds.

Required

i) Work-in-progress (Process B) account (9 marks)

ii) Finished goods account assuming 5,000 units were sold during the period

(3 marks)

iii) Profit and loss account (relevant items only) (3 marks)

NB Show all supporting calculations.

(Total: 20 marks)

QUESTION THREE

Your Managing Director has received a performance analysis statement from the cost accountant which he is unable to comprehend. He has therefore approached you with a view to reconciling the two statements and providing a more comprehensive analysis.

The data available is as follows:

	Actual Performance	Flexible Budget
Production and sales level	**2,700 units**	**2,700 units**
	Sh	Sh
Sales	769,500	729,000
Manufacturing costs:		
Direct material	170,100	121,500
Direct labour	171,000	162,000
Variable overheads	112,500	81,000

Fixed overheads	54,000	40,500
	507,600	405,000
Gross margin	261,900	324,000

The following additional information is relevant:

1. Budgeted gross margin per unit is Sh.120 computed as follows:

Prime Costs	**Sh.**
Direct materials – 6 units @Sh.7.50	45
Direct labour – 2 hours @Sh.30	60
Factory overheads:	
Variable – on direct labour hour basis @Sh.15	30
Fixed – on direct labour hour basis @7.50	15
	150
Gross Margin	120
Budgeted unit selling price	270

2. The company's static provided for a production and sales level of 3,300 units at a price of Sh.285 per unit.

3. Actual inputs usage was as follows:

Direct material – 18,900 units
Direct labour - 6,000 hours

Required

a) Compute the following:

i) Sales price variance;
ii) Material price and efficiency variances;
iii) Labour rate and efficiency variances;
iv) Variable overhead spending and efficiency variances;
v) Fixed overhead under applied and efficiency variance (15 marks)

b) A reconciliation statement that explains the difference in the profit figure of Sh.261,900 and Sh.324,000 (5 marks)

(Total: 20 marks)

QUESTION FOUR

Millani General Manufacturers produces three products, namely A,B and C. Given below are the details of raw materials and labour which were used during the year ended 31 December 1996.

Raw Materials	Standard price per Kg	Material requirements (Kg)		
	Sh.	A	B	C
R1	30	4	-	8
R2	15	2	3	-
R3	50	1	5	2

Direct Labour	Standard rate per hour	Labour hour requirement		
	Sh.	A	B	C
Skilled	40	10	5	-
Unskilled	25	-	3	8

The production overhead which was Sh.500,000 was absorbed on the basis of direct labour hours.

Non-production overheads were absorbed on the basis on 20% of production cost.

Profit is calculated as 25% of the total cost.

The following information is also available for the year:

			A	**B**	**C**
1.	Sales for the year		Sh. 7,350,000	4,125,000	3,255,000
2.	Finished goods stock valued at standard total production cost:	1 January	Sh.490,000	440,000	620,000
		31 December	Sh. 350,000	330,000	403,000
3.	Direct labour hours		28,000	12,000	10,000

			R1	R2	R3
4.	Raw materials		Sh.	Sh.	Sh.
		1 January	15,000	10,000	17,500
		31 December	24,000	16,500	12,300

Required

a) The standard selling price per unit of each product (8 marks)

b) The production budget in units (6 marks)

c) The direct materials purchase budget (6 marks)

(Total: 20 marks)

QUESTION FIVE

You have been approached by the directors of PQR Ltd. a merchandising company about

the control of the company's stocks. The company's average sales amount to Sh.5million per month and holds inventories of about Sh.2million at any one time. Most of the company's items are low-value fast moving components used in the motor industry. At the present time no policies or records exist concerning stocks and this has resulted in inappropriate managerial decisions.

Required

Enumerate the major considerations that the directors need to address in order to achieve an effective stock control policy.

(Total: 20 marks)

SECTION II

QUESTION SIX

Understanding cost behaviour is crucial in the appreciation of cost accounting practices.

Required

With reference to specific examples develop an argument in support of this contention.

(Total: 20 marks)

QUESTION SEVEN

An external consultant has advised your Managing Director about the need to implement a budgetary control system. From the feedback you have obtained, it is apparent that the consultant only disclosed the positive aspects.

Required

Draft a memorandum to the Managing Director explaining the meaning of budgetary control and the limitations one needs to consider in implementing the process. **(Total: 20 marks)**

KENYA ACCOUNTANTS AND SECRETARIES NATIONAL EXAMINATIONS BOARD

CPA PART 2

COST ACCOUNTING

Tuesday: 3 December 1996
Time Allowed: 3 hours

Answer FOUR questions in SECTION 1 and ONE question in SECTTION II. Marks allocated to each questions are shown at the end of the question. Show all your workings.

SECTION I

QUESTION ONE

The following transactions relate to item A101 stocked by Excel Products Ltd. for the month of September 1996:

Receipts:

Date	Quantity	Unit Cost (Sh)

3	2,500	18
10	2,700	21
17	3,100	22
19	2,800	21
25	2,750	22
27	3,200	23
30	3,250	24

Issues

Date	Quantity
6	3,300
16	2,800
23	2,250
26	3,950
28	2,600
30	6,950

The closing balance for the month of August 1996, was a batch of 3,000 units received at a unit price of Sh.20.

Required

Under FIFO system of stores issues, a stores perpetual inventory record for item A101.

(Total: 20 marks)

QUESTION TWO

a) What assumptions under lie the break-even analysis? (9 marks)

b) Target Products Ltd. Has just been incorporated and plans to produce a product to retail at Sh.20 per unit. The company has a choice of installing Machine A or B each of which has an annual production capacity of 10,000 units.

Machine A could attract fixed costs of Sh.50,000 per annum and would yield a profit of Sh.50,000 per year if sales hit the 10,000 units target.

Machine B could attract a fixed cost of Sh.24,000 per year and would yield a profit of Sh.36,000 per annum with a sales level of 10,000 units.

Variable costs vary directly with production for both machines.

Required

a) Break-even sales for each machine. (3 marks)

b) The sales level at which both machines are equally profitable
(4 marks)

c) The range of sales where one machine is more profitable than the other
(4 marks)

(Total: 20 marks)

QUESTION THREE

Intercom Products Ltd. manufactures a number of products. The following data relates to

one of its products for the month of November 1996:

	Sh. '000'
Budgeted profit for the month	1,620
Variances: Favourable/(Advers e)	
Sales margin quantity	(630)
Direct material price	360
Manufacturing overheads:	
- Volume	(675)
- Expenditure	(300)
Selling and administration:	
- Volume	(504)

- Expenditure	150
Actual profit for the month	21

However, the company's budgeted production and sales for the month were 1,200,000

units but only 1,000,000 units were produced, out of which only 900,000 were sold.

The company's unit standard cost for the product is as follows:

	Sh	**Sh.**
Direct materials		5.00
Direct Labour		3.00
Overheads:		
- Variable	2.00	
- Fixed	1.50	3.50
Selling and administration:		

- Variable	1.00	
- Fixed	1.50	2.50
Profit margin		1.00
Unit selling price		15.00

It is the company's policy to value stock at standard cost. There were no opening or

closing stock of work-in-progress.

Required

a) Profit and loss statement under total costing (6 marks)

b) Profit and loss statement under direct costing (6 marks)

c) A reconciliation of profits obtained in (a) and (b) above. (4 marks)

d) Explanation of the difference in profits or losses obtained in (a) and (b) above.

(4 marks)

(Total: 20 marks)

QUESTION FOUR

Southend Quarries Ltd. crushes and refines mineral ore into three products in a joint

operation. For the year to 31 May 1996, the cost and production figures of the company

were as follows:

Department A: Initial joint costs Sh.4,200,000 producing 100,000 Kg. of Classic;

300,000 Kg of deluxe and 500,000 Kg of standard..

Department B: Process Classic further at a cost of Sh.2,000,000.

Department C: Process Deluxe further at a cost of Sh.3,000,000.

Results achieved for the year under reference were:

Classic: 100,000kg completed; 95,000kg sold for Sh.200 per Kg; final stock

5,000Kg.

Deluxe: 300,000Kg. Completed; 295,000Kg sold for Sh.5 per Kg,; final stock

5,000Kg.

Standard: 500,000Kg completed; 495,000 Kg sold for Sh.20 per Kg; final stock

5,000Kg. It required no further processing.

Required

a) Allocation of the joint costs to the three products using the net realizable – value

method
(12 marks)

b) Total and unit value of closing stock schedule (8 marks)

(Total: 20 marks)

QUESTION FIVE

Your organization is considering introducing additional capital into the business in order

to be able to build a new factory to replace the existing one at cost of Sh.20 million.

Discuss the various factors you would consider in order to satisfy yourself that the new investment is justified in terms of efficiency and profitability.

(Total: 20 marks)

SECTION II

QUESTION SIX

a) What are the main features of double entry cost accounting?
(10 marks)

b) Describe the matters to which attention should be paid in locating the differences if any between the profit disclosed by the cost accounts and

that disclosed by the financial accounts for the same period
(10 marks)

(Total: 20 marks)

QUESTION SEVEN

Write explanatory notes on the following:

a) Fixed and flexible budget.
(10 marks)

b) Controllable and uncontrollable costs
(10 marks)

(Total: 20 marks)

KENYA ACCOUNTANTS AND SECRETARIES NATIONAL EXAMINATIONS BOARD

CPA PART 2

COST ACCOUNTING

Tuesday: 11 JUNE 1996
Time Allowed: 3 hours

Answer FOUR questions in SECTION 1 and ONE question in SECTTION II. Marks allocated to each questions are shown at the end of the question. Show all your workings.

SECTION I

QUESTION ONE

Mkulima Engineering Ltd. undertakes repair and reconditioning work on agricultural machinery. It is the company practice to charge out each job at a profit of 15% of the invoice value. Cost card relating to completed jobs for the year ended 31 may 1996 have been summarized as follows:

	Sh.	Sh.
Materials issued		232,000
Direct labour		170,000
Overhead:		
20% on material	46,400	
100% on direct labour	170,000	216,400
Carriage		6,350
Profit		110,250
Sales		735,000

The firm's accountants have summarized the financial accounts for the year as follows:

		Sh.
Sales		735,000
Less:		
Stocks and work-in-progress	Sh.	
1 June 1995	90,000	

Purchases of materials	256,500	
	346,500	
Less:		
Stocks and work-in-progress 31 May 1996	100,500	
	246,000	
Factory wages	255,000	
Factory expenses	100,000	601,000
Gross profit		134,000
Less:		
General Office expenses	42,000	
Selling expenses	18,000	
Carriage on completed jobs	6,000	66,000
Net Profit		68,000

Additional Information

1. The composition of the stocks and work-in-progress figures is as follows:

	1 June 1995 Sh.	31 May 1996 Sh.
Stocks of materials	30,000	31,000
Work-in-progress:		
Materials	45,000	45,500
Labour	15,000	24,000

2. Factory wages consist of Sh.194,000 for direct labour and Sh.61,000 for indirect labour.
3. Included in the purchases of materials figure is Sh.10,500 in respect of consumable stores all of which were used during the year.

Required

a) A statement reconciling the two profit figures for the completed jobs summary

and the annual accounts

(14 marks)

b) Outline the possible reasons for the discrepancies, which your reconciliation reveals.

(6 marks)

(Total: 20 marks)

QUESTION TWO

The following data relates to Optimal Company, a manufacturer of a toothpaste product.

Financial extracts for the month of May 1996

Fixed costs	Sh.200,000
Variable cost	Sh.12 per unit
Selling price	Sh.28 per unit

The current production is at 75% capacity and the number of units produced and sold is

37,500 units.

Required

a) The break even point in units and in shillings (5 marks)

b) The percentage capacity at break even point (3 marks)

c) The profit or loss at current production capacity (4 marks)

d) A new break even point in units assuming that a new machine is bought, in order to increase production. The new machine will increase the fixed costs by Sh.70,000 but the variable costs will reduce to Sh.7 per unit. (4 marks)

e) State four assumptions that you have taken into account in answering the sub-questions a, b, c and d above.

(4marks)

(Total: 20 marks)

QUESTION THREE

L M N Ltd is a small company that makes a single standard product. Their planned budget for the quarter ending 31 May 1996 was 5000 units at a selling of Sh.30 per unit.

The actual financial data for the quarter was 4,800 units which were all sold during the quarter. The actual financial data for the quarter are shown below:-

	Sh.
Direct materials	19,800
Direct wages	29,800
Variable overheads	48,500
Fixed overheads	26,000
Profit	24,400
Sales	148,500

The standard direct wage rate is Sh.15 per hour and standard variable overhead rate is Sh.25 per hour. Cost variances during the period are as follows:

	Gains	Losses
	Sh.	Sh.
Material price	-	200
Material usage	-	400
Wages rate	500	-
Labour efficiency	-	1,500
Variable overhead price	2,000	-
Variable overhead efficiency	-	2,500
Fixed overhead cost	-	1,000
Sales price	4,500	-

Required

From the information provided, prepare for the period the original budget and budgeted cost of actual sales, and prepare a statement showing all standards (variances) in respect of the product.

(Total: 20 marks)

QUESTION FOUR

a) Distinguish between job and contract costing.

(5 marks)

b) Jengo construction company was awarded a small contract on 1 July 1995 at an agreed price of Sh.4,000,000. The contract was expected to be completed by 31 March 1996.

The following expenditure was incurred during the year ended 31 December 1995.

	Sh.
Materials delivered to site	1,200,000
Materials sold (Cost Sh.21,000)	13,000
Variable overheads	48,500

Plant delivered to site	400,000
Payment to Sub-contractors	100,000
Wages paid	506,000
Proportion of Head Office costs	60,000

On 31 December 1995 the value of plant was 265,000 and materials remaining at the site was Sh.20,000. The cash received form the client was Sh.2,100,000.

In order to complete the contract on time the following estimates of expenditure were budgeted by the contractor:

	Sh.
Additional materials	600,000
Additional	380,0

wages	00
Additional plant	120,000
Head office expenses	15,000

The value of the plant at the end of the contract will be Sh.195,000. a contingency of Sh.55,000 was provided for.

Required

A contract account for the year ended 31 December 1995 showing the amount to be transferred to the profit and loss account

(15 marks)

(Total: 20 marks)

QUESTION FIVE

The information given below is in respect of the proposed budget for K.K. Ltd for the six months ending 31 December 1996.

Month	Sales Sh '000'	Material Purchases	Wages Sh. '000'	Production Overheads Sh. '000'	Administ t Overhea Sh. '0
July	72,000	25,000	10,000	6,000	5,5
August	97,000	31,000	12,100	6,300	6,7
September	86,000	25,500	10,600	6,000	7,5
October	88,600	30,600	25,000	6,500	8,9
November	102,500	37,000	22,000	8,000	11,0
December	108,700	38,800	23,000	8,200	11,5

Additional information

1. A depreciation expense is expected to be 0.5% of sales.

2. Expected cash balance in hand on 1 July 1996 is Sh. 72,500,000.
3. 50% of total sales are cash sales/
4. Assets are to be acquired in the months of August and October at Sh.8,000,000 and Sh.25,000,000 respectively.
5. An application has been made to the bank for the grant of a loan of Sh.30,000,000 and it is hoped that it will be received in the month of November
6. It is anticipated that a dividend of Sh.35,000,000 will be paid in December
7. Debtors are allowed one month's credit
8. Creditors for materials purchases and overheads grant one months credit
9. Sales commission at 3% on sales is paid to the salesmen each month.

Required

A cash budget for the six months ending 31 December 1996. **(Total 20 marks)**

SECTION II

QUESTION SIX

State and explain the factors you will take into account when preparing:

a) A sales budget.
(10 marks)

b) A purchases budget
(10 marks)

(Total: 20 marks)

QUESTION SEVEN

Discuss the main purposes of advertising by a company with reference to:

a) An existing product
(10 marks)

b) A new product
(10 marks)

(Total: 20 marks)

MODEL ANSWERS TO CPA PAST PAPERS

MODEL ANSWERS TO CPA 2 EXAMINATION SET ON 2ND DECEMBER 1997

QUESTION ONE

Naomi Ltd

a) Actual quantity of direct material consumed.

Actual quantity 7,556	x	Standard Price 720	5,440,000	
Standard quantity 7,756	x	Standard Price 720	5,584,000	The actual
			144,000 F	

quantity used is 7,556 units **assuming the standard material** price is Sh.720.

b) The actual price per kg paid for the material

Actual quantity	x	Actual Price	5,712,000	
7,556		756		
Actual quantity	x	Standard Price		
7,756		720	5,440,000	The actual price paid for the
			272,000	
			(A)	

materials is shs.756

c) The actual direct labours worked

Actual labour hours	x	Actual rate	4,080,000	
	x	68		
∴ Actual labour hours	=	4,080,000 / 68	= 60,000 hours	

d) Actual direct labour hours worked in excess of standard.

Actual labour hours	x	Actual Rate	4,080,000
Actual labour hours	x	Standard rate	
Actual labour hours 60,000	x	Standard rate 70	4,200,000
60,000		70	4,200,000 (F)
Standard labour hours 58,400	x	Standard rate 70	4,088,000
			112,000 (A)

Excess of actual labour hours over standard is
60,000 – 58,400 = 1,600 hours

QUESTION TWO

a) Distinguish between joint products and by-products

Joint Products	By-Products

- Are products two or more which are output form the same process but are indistinguishable from each other up to their point of separation - They may require further processing before selling.	- A by-product is produced at the same time and from the same common process as a main product or joint products but has a lower-sales value than the joint products or main product. - Don't require further processing and usually don't have a resale value.

b) Plastic Limited.

MOULDING PROCESS ACCOUNT

	Units	Cost Shs		Units	Cost Shs per unit
Input	5,0	30,00			

	00	0				
Moulding costs		120,000	Normal loss to			
			Transfer to	250	-	-
			Finishing process	4,750	31.60	150,000
	5,000	150,000		5,000		150,000

FISHING PROCESS ACCOUNT

	Units	Cost Units	Shs		Units	Cost Units	Shs
Transfer from Moulding	4,750	31.60	150,000				
Finishing Costs			76,	Abnormal loss	15	47.	7,1

		000		0	60	37
			Transfer to Finished goods	4,60 0	47.60	218,863
4,750	226,000			4,750		226,000

* In process one the normal loss has no value because it has no scrap value.

Moulding Process

Cost /Unit = Total Process Cost =

150,000 =

Shs.31.60

Expected output 5,000 x 95%

Cost of Plastic Material = 4 x 7,500 = 30,000

Moulding cost = 5,000 x 24 = 120,000

Finishing Process

Finishing Cost = 4,750 x 16 = 76,000

Cost/Unit = Total Process Cost = 226,000 = Shs.47.60
Expected output 4,750

QUESTION THREE

Kazuri Construction Limited.

CONTRACT ACCOUNT FOR TH YEAR ENDED 30TH JUNE 1999

	Shs '000'		Shs '000'
Plant sent to site	4,000	Plant on site	3,000
Direct materials to site	18,400	Material unused on site	1,600
Direct wages	14,000		
Direct expenses	1,800		
Hire of crane	1,600		
Indirect labour costs	2,800		
Supervision salaries	1,680		
Consultancy	230		

fees			
Service costs	720		
Hire of machinery	800		
Overhead incurred on site	2,400		
Head office expenses	2,800		
Wages accrued	1,200		
Service costs accrued	80	Cost of work done c/d	48,000
	52,600		52,600
Cost of work done b/d	48,000	Value of certified work	50,000
Profit taken (W_1)	6,400	Cost of work not certified	10,000
Profit retained (W_2)	5,600		
	60,000		60,000
Plant on site	3,000		
Material unused on site	1,600	Profit retained	5,600

Workings

National profit = 60,000,000 – 48,000,000 = 12,000,000

Profit taken $= \frac{2}{3} \times 12{,}000{,}000 \times \frac{\text{cash received}}{\text{value of work certifie}}$

$= \frac{2}{3} \times 12{,}000{,}000 \times \frac{40{,}000{,}0(}{50{,}000{,}0(}$

$= \underline{6{,}400{,}000}$

QUESTION FOUR

a) Reasons for business to prepare budgets

1. Co-ordination – This is when budgeting effects of one department are related to those of other departments. This enhances department co-ordination and functional co-ordination.
2. It helps in clarification of authority and responsibility
3. Communication – The budgetary process involves discussion at all levels of management thus facilitating communication.
4. Control - It facilitates control, as actual performance is compared to budgeted performance.
5. Motivation and goal – A well organized budgeting system encourages genuine participation and involvement of operating management in its preparation and

establishment of agreed performance levels. This has a motivating effect.

6. Performance evaluation – A manager's performance can be judged by hi/her ability to meet the budget.

b)

i. Budgeted Purchases

	Units
Expected sales	10,000
Closing stock	1,700
Total stock requirement	11,700
Less: Opening Stock	(1,300)
Purchases budgeted	10,400

ii. Budgeted Debtors

	Shs
Expected credit sales	4,860,000

Balance of debtors 1 Nov.1997	700,000
Total debtors	5,560,000
Expected collections from customers	4,700,000
Balance of debtors 30 Nov.1997	860,000

iii. Cash Budget

	Shs
Receipts	
Cash receipts	1,960,000
Expected collection from customers	4,700,000
Total receipts	6,660,000
Less: Expected cash disbursement	(1,740,000)
Surplus of receipts over payments	4,920,000
Opening cash balance	840,000
	5,760,000

Assumption – Expected cash disbursements includes purchases.

QUESTION FIVE

a) Factors to consider when choosing an overhead method:-

1. Easy to use and compute
2. Relation – The base used should be related to the course of the overhead. Where a company is highly mechanized its preferable for it to use machine hours as base rather than labour hours.
3. The method used should be easily explainable to the managers.
4. Cheap to use

b)

(i)

Reta Manufacturing Company

Profit and Loss Account for 1997 (absorption costing method)

	Shs	Shs
Sales (300 x 160,000)		48,00

		0
Less: Cost of sales		
Opening Stock (200 x 20,000)	4,000	
Production (180,000 x 200)	36,000	
	40,000	
Less: Closing Stock (40,000 x 200)	(8,000)	(32,000)
Gross profit		16,000
Less: Selling & Administration Expenses: Variable	4,000	
	2,000	(6,000)
Fixed		
Net profit		10,000

Reta Manufacturing Company
Profit and Loss Account (Direct – Costing method) For year 1997

	Shs ‘000’	Shs ‘000’

Sales (300 x 160,000)		48,000
Less: Variable cots		
Production (160 x 160,000)	25,600	
Selling and administration expenses (W_1)	3,556	(29,156)
Contribution		18,844
Less; Fixed costs		
Production (40 x 160,000)	6,400	
Administration and selling	2,000	(8,400)
Net Profit		10,444

QUESTION SIX

Factors to consider when setting the standard labour costs of a product:-

1. Total estimated labour costs: This should be calculated to know how much it will cost the company to make a certain number of units.

2. Labour hours used: Labour hours used for the whole portion of one unit should be computed and known.

3. Wage rate: The amount paid to a worker should be known and classified either if its per unit or per hour.

4. Type of Labour: Type of labour whether skilled or unskilled should be known and their mode of payment whether its fixed e.g. production manger or variable e.g. labourers.

5. Number of units to be made: This will help establish the labour cost/unit and thus set the standard labour cost per product.

6. Labour efficiency and changes: The efficiency of the current labour force should be considered and any changes during production should be considered when designing a standard labour cost of a product.

7. Overtime payments: Overtime paid should be considered to ensure that eh

standard labour costs correctly represents costs incurred by a product.

8. Bonus payments: This is payment for efficiency. Historical data can show the bonus expected from a given production. This should be considered in computation of a standard labour cost of a product.

QUESTION SEVEN

a)

i. Profit Centre and cost Centre

Profit Centre: This is a control point. It ensures that the firm achieves its targeted profit. This center is involved in increasing sales and at the same time reducing costs. This is an important point in a firm because the main objective of a firm is to maximize profit

Cost Centre: This is a control point. It collects all the costs and apportions them to other centers according to the benefit accrued by the other centers. This center is involved in reducing costs. It charges costs to the persons or centers who are responsible for the cost.

ii. Product Costs and Period Costs

Product Costs: these are costs which can be directly identified with a product e.g. cost of purchase, transport costs e.t.c. These costs are included in the stock valuation of

finished goods and W.I.P until such goods are sold

Period Costs: These are costs which aren't included in the stock valuation and are treated as expense in the period in which they were incurred e.g. administration research and development cots e.t.c. These are costs that can't be identified with a given product.

- Management Decisions affects cost behaviour of relevant cots. Relevant costs are future costs which will change with the decision made therefore management decision will affect the behaviour of costs by: -

- Controllable: Managers can give different people varying responsibilities and authorities towards a given costs. To the senior officers the cost will be controllable but to the junior officers it will be uncontrollable. Management decisions affects the

controllability of different officers in the company.

- Fixed and variable costs: Management may decide to treat a cost as either fixed or variable. This will affect the behaviour of the cost.

- Avoidable and Non-avoidable Cost: Management make different decisions and therefore choose different alternatives. They may choose an alternative which may make a particular cost to be unavoidable whereas the cost would be avoidable if a given alternative was taken up.

- Sunk Costs: Management decisions make costs to be sunk therefore a decision made by manager influences which cots will be sunk and which ones won't.

MODEL ANSWERS TO CPA 2 EXAMINATION SET ON 6TH JUNE 1997

QUESTION ONE

a) Overhead absorption rates

	Assembly
Material	480,000
Labour costs	180,000
Prime cost	660,000
Overhead	594,000
Overhead absorption rate	594,000 ÷ 660,000

Sh.0.9/Prime cost

		Finishing
Total cost of assembly		1,254,000
Total cost of finishing		
Materials	300,000	
Labour costs	120,000	420,000
		1,674,000
Overhead cost		418,500
Overhead absorption rate		418,500 ÷ 1,674,000 = Sh.0.25/accumulated cost

b) Job No. 148

	Assembly Sh.	Finished Sh..

Materials	5,000	3,500
Labour costs	2,700	1,600
Prime cost	7,700	5,100
Overhead	6,930	4,932
W_1		.50
Total costs	14,630	10,032 .50

Workings

1. Assembly = O.A.R x Prime Cost = 0.9 x 7,700 = Sh.6,930

Finished = O.A.R x Accumulated Cost =

Accumulated cost = 14,630 + 5,100 = 19,730

Finished = 0.25 x 19,730

c)

	Assembly	Finishing
	Sh.	Sh..
Materials	530,000	288,000
Labour costs	200,000	135,000
Prime cost	730,000	423,000
Overhead W_1	657,000	452,500
Total costs	1,387,000	875,500

Workings

1. Overhead absorbed

Assembly = O.A.R x Prime cost

= 0.9 x 730,000

= 657,000

Finishing = O.A.R x Assembly cost + Finishing Accumulated cost

= 0.25 x (1,387,000 + 288,000 + 135,000) =

= 452,500

	Assembly	**Finishing**
	Sh.	Sh..
Overhead incurred	660,000	450,000
Overhead absorbed	(657,000)	(452,500)
(Over absorption)/under absorption	3,000	(2,500)

QUESTION TWO

a) Equivalent units of production is the equivalent finished product of the closing W.I.P. This is used to value of output in a process where W.I.P exists. If all elements of costs are not complete to the same extent then equivalent units are calculated fore each element of cost.

This enables the correct valuation of the closing W.I.P. and to determine the value of the finished goods transferred to the next process.

b) XYZ Ltd

Process B

	Units	Sh.		Units	Sh
From process A	12,000	450,000	Transfer to finished goods	8,640	820,72 3
Direct materia		345,600	W.I.P.	2,400	174,68 2

ls					
Direct labour		158,400	Normal loss	600	-
Man. Overheads		75,600	Abnormal loss	60	34,195
	12,000	1,092,600		12,000	1,092,600

Statement of equivalent units of Production

Cost element	Total	Completed	Closing W.I.P	Abnormal loss	Total	Cost unit
Previous Process	450,000	8,640	2,400	360	11,400	39.4
Direct materials	345,600	8,640	1,440	360	10,440	33.1
Direct labour	158,400	8,640	1,440	360	10,440	15.1
Man. overhead	75,600	8,640	1,440	360	10,440	7.2
	1,029,					

600

Valuation of Working - Process	Sh.
Previous Process (360 x 39.47)	94,737
Direct materials (1,440 x 33.10)	47,669
Direct labour (1,440 x 15.17)	21,848
Man. overhead (1,440 x 7.24)	10,428
	174,682

Valuation of finished goods	Sh.
Previous Process (8,640 x 39.47) =	14,211
Direct materials (8,640 x 33.10) =	286,014

Direct labour (8,640 x 15.17) =	131,090
Man. overhead (8,640 x 7.24) =	62,566
	820,723

Valuation of Abnormal loss	Sh.
Previous Process (360 x 39.47) =	14,211
Direct materials (360 x 33.10) =	11,917
Direct labour (360 x 15.17) =	5,460
Man. overhead (360 x 7.24) =	2,607
	34,195

WORK IN PROGRESS (B) ACCOUNT

	Units	Sh.		Units	Sh.
Process B account	2,400	174,682	Bal c/d	2,400	174,682

FINISHED GOODS ACCOUNT

	Units	Sh.		Units	Sh.
Process 2 Account	8,640	820,723	Trading a/c	5,000	474,955
			Balc/d	3,640	345,768
	8,640	820,723		8,640	820,723

PROFIT AND LOSS A/C

	Sh		
Abnormal loss	34,195	Gross profit	

QUESTION THREE

a) i) Sales price variance = (Budgeted selling price – Actual price) Actual units sold

= (270 – 285)2,700

= Sh.40,500 unfavourable

ii Material variances

Actual Quantity x Actual price
170,100

Actual Quantity x Std price
18,900 x 7.50
141,750

Material price variance
28,350 Unfavourable

Actual Quantity x Std price
141,750

Std Quantity x Std price
19,800 x 7.50
148,500

Material efficiency variance
6,750 Favourable

iii Labour rate and efficiency variances

Actual labour hrs x Actual rate
171,000
Less
Actual labour hrs x std rate
6,000 30
180,000
Labour rate variance = 9,000 Favourable

Actual labour hrs x std rate
180,000
Less
Std labour hrs x std rate
3,300 x 2 x 30
198,000
Labour efficiency variance = 18,000 Favourable

iv) Variable overhead spending and efficiency variances

Actual variance overhead incurred 112,500
Less
Actual labour hrs x VOAR

6,000 x 15 _
90,000
Variable overhead spending =
22,500 Unfavourable

Actual Labour hrs x VOAR
90,000
Less
Std Labour hrs x VOAR
3,300 x 2 x 15
99,000
Variable overhead efficiency
9,000 Favourable

v) Fixed overhead under applied and efficiency variances

Actual fixed overhead incurred
54,000
Budgeted fixed overhead
3,300 x 2 x 7.50
49,500
4,500
Unfavourable

Actual labour hrs x F.O.A.R
6,000 x 750
45,000

Standard labour hrs x F.O.A.R
3,300 x 2 x 7.50
49,500
efficiency variance =
4,500 Favourable

QUESTION FOUR

a) The std selling price/unit

	A	B	C
Raw material	120	-	240
R_1 (30)	30	45	-
R_2 (15)	50	250	100
R_3 (50)			
Raw material costs	200	295	340
Skilled Labour (40)	400	200	-
Unskilled labour (25)	-	75	200
Total labour costs	400	275	200
Prime cost	600	570	540
Production	10	8	8

overhead (W_1)			
Total production cost	610	578	548
Non-production overhead (W_2)	122	115.60	109.60
Total cost	732	693.60	657.60
Profit 25% total cost	183	173.40	164.40
Std. Selling price	915	867	822

Working

1.

	A	B	C	Total
Direct labour hrs	28,000	12,000	10,000	50,000
Apportioning of production overhead	28,000 x 500,000	12,000 x 500,000	10,000 x 500,000	

	50,000	50,000	50,000
	280,000	120,000	100,000
Labour hrs/unit	10	8	8
Units	28,000	15,000	12,500
Overhead/ unit	280,000 ÷ 28,000	120,000 ÷ 15,000	100,000 ÷ 12,500
	10	8	8

2.

Non-production overhead	A	B	C
Total production cost	610	578	548
20%	122	115.60	109.60
	732	693.6	657.60

b) Production budget in units

	A	B	C
1 Jan in Sh.	490,000	440,000	620,000
Units	490,000 ÷ 610 803 units	440,000 ÷ 578 761 units	620,000 ÷ 548 1,131 units
Closing stock (Sh)	350,000	330,000	403,000
	350,000 ÷ 610 574 units	330,000 ÷ 578 571 units	403,000 ÷ 548 735 units
Sales in Sh.	7,350,000	4,125,000	3,255,000
Units	7,350,000 ÷ 915 8033 units	4,125,000 ÷ 867 4758 units	3,255,000 ÷ 822 3960 units

Production budget (units) for the year ended 31 December 1996

	A	B	C
Sales requirement	8,033	4,758	3,960

Closing stock	574	571	735
Total requirement	8,607	5,329	4,695
Less: opening stock	(803)	(761)	(1,131)
Production budget	7,804	4,568	3,564

c) Direct material purchase budget

		R_1	R_2	R_3
Units used by:	(7,804)	31,216	15,608	7,804
A	(4,568)	-	13,704	22,840
B	(3,564)	28,512	——-	7,128
C				
Units used		59,728	29,312	37,772
Cost/unit		30	15	50
Total production raw material		1,791,840	439,680	1,888,600

cost			
Closing balance	24,000	16,500	12,300
Total raw material required	1,767,840	423,180	1,876,300
Less: opening balance	(15,000)	(10,000)	(17,500)
Purchase budget	1,752,840	413,180	1,858,800

QUESTION FIVE

For the directors of PQR Ltd to achieve an effective stock control policy they should ensure.

Stock control - This entails ensuring that the material is of the right place at the most economic cost. The directors should ensure that there are control points eg during ordering, during storage, during receiving of stock etc.

Stock coding - They should implement a coding system which help the firm in checking the stock items available easily this helps the stock recording to be very flexible and this can enable stock details to be computerized.

Stock recording and documentation - This involves different records for the different transactions that stock goes through. Each transaction involves authority and expenditure and hence points of cost control e.g.

Transaction Document

Material ordering	Purchase requisition
Material purchase	Purchase order

Storage and Issue of materials – This is a store keeping function. It involves storing materials to achieve:-

- Speedy issue and receipt of materials
- Full identification of materials at all times
- Correct location of material at all times
- Provision of suitable storage condition

This plays a major factor in stock in making a stock control policy. An effective storage ensures reduction in damages, theft etc. An effective issue of material ensure efficient production and thus availability of finished goods.

Stock re-ordering - The stock control policy should ensure that an economic order quantity is made in each order to reduce both holding and re-ordering costs. This plays a major role in stock

control because the purpose of a stock control policy is to reduce stock costs. This ensures that adequate stocks is available but avoid production stoppages, which may result in customer dissatisfaction etc.

The good stock control policy relieves management of taking decisions for every item held in stock. It should specify the stock system that a firm should have i.e.

1. Demand and supply systems
2. Just in time stock system
3. Perpetual inventory system

QUESTION SIX

Understanding cost behaviour is crucial in appreciating cost accounting practices.

Costs are classified in relation to changes in the level of activity. We have:-

1. Fixed costs
2. Variable costs
3. Semi-fixed/semi-variable costs
4. Relevant and irrelevant cost

Fixed costs - These are costs which within certain output range tend to be unaffected by variation in the level of activity (i.e. volume of output, labour hours etc) e.g. salary of the managing director.

Variable costs - They vary in direct proportion to the volume of activity. Total variable costs are linear while unit variable cost is constant e.g. material costs, sales commission etc.

NB – The distinction between fixed and variable cost is on the short run over a sufficient long time virtually all costs change.

Semi-fixed costs - These are costs which have both elements of fixed and variable costs eg telephone and postage costs.

Relevant and Irrelevant costs - Relevant costs are future costs which will change with decisions made or is a cost which will make the management to change their decision i.e. it influences management.

Irrelevant costs – They are not affected by decisions made.

Understanding of the cost behaviour helps the management in:-

Planning:_ - By examining the behaviour of a cost from past records, management can forecast the costs to expect in a given period or with a given production level. This helps the management in

planning which essential in a proper running of the firm and also helps in achieving goals.

Decision making - Costs behaviour helps the management in making quality and in time decisions. It can also influence whether the management should adopt a certain production or not due to the different costs.

Controlling - Costs behaviour helps management in setting standards and measuring standard sets against actual performance and thus ensures control which is a main pillar in proper management.

Organization - Costs behaviour helps management to know who or which machines have the least costs. This will help the management to organize their work force so as to have a minimum cost work force.

Other costs behaviour classifications that can influence management of a firm are:-

- Avoidable costs - Those that can be saved by adopting a given alternative
- Non-avoidable costs – Can't be saved therefore Avoidable costs are relevant in decision making.
- Sunk costs – They are past costs which are created by past decisions and can't be changed by any future decisions. They are irrelevant to decision making.

QUESTION SEVEN

To: Managing Director

From: Chemiey Chief Accountant

Subject: Meaning of budgetary control and its limitations

Date: 4th January 2001

Budgetary control means where a firm prepares budget to act as a goal to be achieved. After performance, the actual performance is compared with the budgeted performance and a control

action taken. There is the master budget, which is made up of smaller budgets e.g. Cash, sales, purchase budgets etc.

The limitations of budgetary control are: -

1. **It's a forecast** - Budgets involve predicting the activity levels of a firm in the coming period therefore the budgets mostly will not show with certain what will really happen because no one can predict the future with certain.
2. **Its not subject to change** – What is budgeted mostly turn out to be different with what is achieved. Due to the uncertainty of the future, what is expected is not usually what is achieved. Budgets do not cater for this especially fixed budgets.
3. **Expensive** – Its expensive to prepare a budget because a lot of research is to be undertaken so as to know what to expect.
4. **Unrealistic goals** – A budget is a target, which should be reached. Poor

research on what is expected and what the firm has may lead to setting of an unattainable goals. This makes the budget loose its meaning and purpose.

5. **Reduced motivation** - Budgets are supposed to boost a firm's personnel morale. Unrealistic budgets may strain the personnel and thus reduce their motivation. This will lead to insufficiency and ineffectiveness.
6. **It maybe subjective** – Budgets are prepared by humans who have their own self-interests. This may lead to subjective budgets being prepared which may lead to poor performance.
7. **Reduced control** – Budgets are control tools. Where poor, subjective, unrealistic budgets are prepared, there is poor control of the firms activity and thus poor management.
8. **Inefficiencies and Ineffectiveness** – In a fixed budget a manager maybe authorized to spend a given amount of money, he will not take any action to ensure he spends less but will do what he is to do and any balance is squandered.

MODEL ANSWERS TO CPA 2 EXAMINATION SET ON 3RD DECEMBER 1996

QUESTION ONE

EXCEL PRODUCTS LTD (A101 PRODUCT)

A perpetual inventory record for item A101 (FIFO)

Date	Receipts			Issues			Balance		
Sep 1996	QTY	Unit Price Sh	Value Sh	QTY	Unit Price Sh	Value Sh.	QTY	Unit Price Sh.	Value Sh.
1							3,000	20	60,000
3	2,500	18	45,000				2,000	18	45,000
6				3,0	20	60,			

				00		000			
				300	18	5,400	2,200	18	39,600
10	2,700	21	56,700				2,700	21	56,700
16				2,200	18	39,600			
				600	21	12,600	2,100	21	44,100
17	3,100	22	68,200				3,100	22	68,200
19	2,800	21	58,800				2,800	21	58,800
23				2,100	21	44,100			
				150	22	3,300	2,950	22	64,900
							2,800	21	58,80

									0
25	2,750	22	60,500				2,750	22	60,500
26				2,950	22	64,900			
				1,000	21	21,000	1,800	21	37,800
							2,750	22	60,500
27	3,200	23	73,600				3,200	23	73,600
28				1,800	21	37,800			
				800	22	17,600	1,950	22	42,900
							3,200	23	73,600
30	3,250	24	78,000				3,250	24	78,000

30				1,950	22	42,900			
				3,200	23	73,600			
	———		———	1,800	24	43,200	1,450	24	34,800
	20,300		440,800	21,850		466,000	1,450	24	34,800

Closing balance as at 30 September 1996 is 1450 units each at sh.24.
Total value = 1,450 x 24 = Sh. 34,800

QUESTION TWO

a) Assumptions that under lie the break-even analysis

- All costs can be resolved into fixed and variable elements
- Fixed costs remain constant
- Variable costs vary proportionately with activity
- Over the activity range being considered, costs and revenues vary linearly
- The only factor affecting cost and revenue is volume of activity
- Technology production methods and efficiency levels remain unchanged
- C.V.P analysis only relates to single products
- There are no stock level changes and stocks are valued at marginal costs only (if there are stock level changes) i.e. units of production = units of sale.
- There is no uncertainty

b) Target Products Ltd

A Break-even point

Machines	**A**	**B**
Sales (10,000 x 20)	200,000	200,000
Less: Variable costs	(100,000)	(140,000)
Contribution	100,000	60,000
Less: Fixed costs	(50,000)	(24,000)
Profit	50,000	36,000
Total variable cost	100,000	140,000
No. of units	10,000	10,000
Variable cost/unit	100,000 ÷ 10,000	140,000 ÷10,000
	Sh. 10	Sh.14

Break even point = $\frac{\text{Total fixed cost}}{\text{Contribution/unit}}$

Machines	**A**	**B**
Total fixed costs	50,000	24,000
Selling price	20	20
Variable cost	10	14
Contribution/ unit	10	6

B.E.P	50,000 ÷ 10	24,000 ÷ 6
	= 5,000 units	4,000 units

b). Sales level at which both machines are equally profitable . Let sales of machine A at this point be a and for machine B b

Profit for machine A = 20a – 10a – 50,000 = 10a – 50,000

B = 20b – 14b – 24,000 = 6b – 24,000

At this point a = b therefore 10a – 50,000 = 6b – 24,000 or

10a – 50,000 = 6a – 24,000 therefore

$\frac{4a}{4} = \frac{26,000}{4}$

a = 6,500 units

The sales level is 6,500 units

c) The range of sales where one machine is more profitable.

Profit when sales = 6,501 units

Machine: A = 6,501(20 – 10) – 50,000 = Sh.15,010

B = 6,501(20 – 14) – 24,000 = Sh.15,006

Profit when sales = 5,999 units

Machine A = 5,999(20 – 10) – 50,000 = Sh. 9,990

B = 5,999(20 – 14) – 24,000 = Sh.11,994

	Range (units)
Machine A	6,501 to 10,000 units
Machine B	4,000 to 5,999 units

QUESTION FOUR

Southend Quarries Ltd

a) Allocation of the joint costs:-

Products	Classic	Deluxe	Std
	Sh.	Sh.	Sh.
Quantity produced	100,000	300,000	500,000
Selling price/unit	200	50	20
Sales Revenue	2,000,000	15,000,000	10,000,000
Subsequent costs	(2,000,000)	(3,000,000)	-
Net realizable value	18,000,000	12,000,000	10,000,000

N.R.V. = 18m + 12m + 10m = Sh.40m
Total joint costs Sh.4,200,000
Apportionment of joint cost

Products	Classic	Deluxe	Std
Apportionm	18 x	12 x	10 x

ent	4.2m 40 Sh.1.8 9m	4.2m 40 Sh.1.2 6m	4.2m 40 Sh.1.0 5m

b) Total cost

	Classic	**Deluxe**	**Std**
	Sh. '000'	Sh.. '000'	Sh. '000'
Joint cost	1,890	1,260	1,050
Subsequent costs	2,000	3,000	-
Total production costs	3,890	4,260	1,050
Quantity produced	100,000	300,000	500,000
Cost/unit	Sh.38.90	Sh.14.2	Sh.2.1
Unit value of c. stock	Sh.38.90	Sh.14.2	Sh.2.1
Total value of c. stock (5,000)	Sh.194,500	Sh.71,000	Sh.10,500

QUESTION FIVE

Factors to consider whether the project is:-

Profitability

1. Cash flows – The cash flows both in and out from the firm should be computed to check whether there is any incremental in the cash flows. Where there is no incremental or even a decrease in cash flows the project (new factory) should be rejected.
2. Net present value – Present value of al the cash flows less initial investment should be computed. Where the net present value is negative, the project should be rejected.
3. Increased sales – The new factory should be undertaken if there is increased sales and the current factory can't support the demand. If the current demand can be handled by the current factory, there is no need of a new factory.
4. Reduced Production costs – If the new factory will reduce costs, then it

will be a good investment. If there will be no change i.e. decrease in the production costs, there will be no need for the new factory.

5. Less operational and labour costs – If the new factory will be more automated and thus less operational and labour costs, then it would be a good venture.

EFFICIENCY

1. Staff – Are the staff well trained to work in the factory or will they need training. Where the new factory will make workers more efficient, then it would be a good venture.
2. Economies of scale – Where the factory will lead to economies of scale and thus reduce production per unit, it would be a viable venture.
3. Quality of produced units – If the new factory will produce more quality products it should be undertaken. As this improves the sales of a company and its overall efficiency.
4. Production duration - If the new factory will reduce production duration,

it should be undertaken as this shows its more efficient.

QUESTION SIX

a) The main features of double entry cost accounting

Accuracy – Double entry ensures that there is accuracy in the books this ensures that for every debit there is a credit.

Control Accounts – Double entry brings in the concept of control accounts which ensures that most entries are entered in the books of the company.

Matching costs and Revenues – Double entry helps to match costs and revenues so as to get the profit for the period.

b) Locating the differences between the profit disclosed by the cost accounts

and by the financial accounts for the period.

Items in the financial account but not in the cost account books:-

1. There are items which increase the financial account profit:- discount received, interest/dividend received, Profit on disposal of fixed assets
2. There are items which decrease the financial account profit: - discount allowed, interest paid, loss on disposal of fixed assets, loss on investment, loss on disposal of fixed assets, loss on investments, loss on fines and penalties
3. Items of expenditure, which are capitalized as assets in the financial accounts eg. Preliminary expenses.
4. Appropriation of profit in the financial statements eg. Dividend paid/proposed, transfer to reserves, income tax etc.

Differences between financial and cost accounting in the calculation of actual overhead costs incurred e.g. in the computation of depreciation there may be a difference in the depreciation method, expected life of the asset.

If there is a temporary closing balance on the under/over absorbed overhead account in the cost account, there will be a difference in the overhead costs for the period between the two accounts which must be included in the reconciliation.

Stock at hand at the end of the period. This is due to the stock valuation method differences. For financial accounts the variation may be the lower of the historical or net realizable value while for cost account FIFO, LIFO, Std Cost, weighted average may be applied.

QUESTION SEVEN

a) Fixed and flexible budget

Fixed budget - Where a master budget is prepared where the production and sales were to meet a standard, it's a fixed budget where a specific target is to be reached.

This means:-

- The budget is prepared on the basis of an estimated volume of production and sales with no plan for changes.
- They are based on one activity level
- When actual volume of production and sales are achieved a fixed-budget is not adjusted to reflect the new levels.

Flexible budget - This is prepared by a process called flexing the budget. For cost control actual costs is compared with budgeted costs for the same level of activity i.e. like must be compared with like. This requires the recognition of costs being classifiable as fixed, variable or semi-mixed costs. Budgeted costs can be adjusted to the level of activity. They are essential because:-

1. Management needs to be informed about performance achieved for its evaluations, a yardstick (budget) must be there.
2. Every business is dynamic and actual volumes of activity can't conform exactly with the fixed budget.
3. For useful control information, actual results must be compared at the actual level of activity achieved against the results that should be expected at this level of activity (the flexible budget).

b) Controllable and uncontrollable costs

Controllable cost – is one that is reasonably subject to regulations by the manager with whose responsibility the cost is being classified. All costs are controllable

at some level of management e.g. Directors can influence almost all costs in an organization e.g. labour costs by varying wage rates or labour hours etc. A supervisor has control on only a few sets of costs.

Most variable costs can be controllable as they can be influenced by the management. Future costs can also be influenced and therefore can be controlled i.e. management may change production to be more efficient and thus influence future production costs.

Uncontrollable cost – is a cost which a manager with whose responsibility the cost is classified can't influence or regulate it. There are costs which the company can't do anything about them e.g.

- Most fixed costs e.g. depreciation where by the machine is depreciated if its used or not. Thus

the management can’t control this cost.

- Past costs – Sunk costs can’t be influenced by the management

MODEL ANSWERS TO CPA 2 EXAMINATION SET ON 11TH JUNE 1996

QUESTION ONE

MKULIMA ENGINEERING LTD

	Cost books	F.A	Difference
	Sh.	Sh.	Sh.
Materials issued	232,000	245,000	(13,000)
Labour	170,000	194,000	(24,000)
Overheads	216,400	231,500	(15,100)
Carriage	6,350	6,000	350
Consumable stores	10,500	-	10,500

RECONCIALATION STATEMENT FOR THE YEAR ENDED 31.5.1996

	Sh.	Sh.
Profit as per financial books		68,000
Add: Material difference	13,000	

Labour difference	24,000	
Overhead difference	15,100	52,100
		120,100
Deduct: Carriage difference	(350)	
	(10,500)	(10,850)
Consumable stores difference		
Profit as per cost books		109,250
Residual difference (110,250 – 109,250)		1,000

b) Reasons for discrepancies which your reconciliation reveals

Residual difference may be due to

- Interest charges in financial accounts
- Loss of sale of assets
- Timing differences where a cost charged to financial account is not yet charged to cost books
- Administration overheads not charged in cost ledger

- Selling overheads not charged in cost ledger

QUESTION TWO

OPTIMAL COMPANY

Fixed costs = sh.200,000 variable costs = Sh.12/unit
Selling price = Sh.28/unit

a) B.E.P

B.E.P = $\frac{\text{Total fixed cost}}{\text{Contribution per unit}} = \frac{200,000}{28 - 12} = \frac{12,500 \text{ units}}{}$

B.E.P in shillings = 12,500 x 28 = Sh.350,000

b) % capacity at B.E.P

75% capacity = 37,500 units

100% capacity = $\frac{37,500}{75\%}$ x 100% = 50,000 units

c) Profit or loss at current production

	Sh.
Sales (37,500 x 28)	1,050,000

Less: variable cost (37,500 x 12)	(450,000)
Contribution	600,000
Less: Fixed cost	(200,000)
Net profit	400,000

d) New fixed cost = 70,000 + 200,000 = Sh.270,000

New variable cost = Sh.7/unit selling price = Sh.28/unit

B.E.P = $\frac{\text{Total fixed cost}}{\text{Contribution per unit}} = \frac{270,000}{28 - 7} = 12,857 \text{ units}$

e) Assumptions:-

- The fixed cost remains fixed even if the production increased or reduced
- The variable cost varies constantly with each unit produced
- The selling price remains at Sh.28/unit

- The cost function and the selling function are linear
- When the new machine is bought (d) there are no economies of scale.

QUESTION THREE

LMN LTD

Material price variance

Actual quantity x Actual price
19,800
Actual quantity x Standard price
19,600
4,800 4.08

200 (A)

Material usage variance

Actual quantity x Std price
19,600
Less
Standard quantity x Standard price
19,200
4.08

400 (A)

Labour rate variance

Actual hours x Actual rate
29,800
2,020 14.75

Actual hours x Standard rate

30,300

2,020 15

500 (F)

Labour efficiency variance

Actual hours x Standard rate

30,300

Less

Standard hours x Standard rate

1,920 15

28,800

1,500 (A)

Variable overhead price variance

Actual variable overhead incurred

48,500

Less

Actual Labour hours x Variable overhead Actual rate

50,500

2,000 (F)

Variable overhead efficiency variance

Actual labours hours x Variable overhead Absorption rate

50,500

2,020 25

Standard labour hours x Variable overhead

Absorption rate

1,920 25

48,000

2,500 (A)

Fixed overhead variance

Actual fixed overhead

26,000

Standard hours of production x Fixed overhead

Absorption rate 25,000

1,920 13.02

1,000 (A)

Sales price variance

Budgeted selling price x Quantity sold

144,000

30 4,800

Actual selling price	x	Quantity sold
148,500		
30.93		4,800
4,500		

LMN LTD

STD budget (Original budget)

	Sh.	Sh.
Sales (5,000 x 30)		150,000
Less:		
Material	19,200	
Labour (1,920 x 15)	28,800	
Prime cost	48,000	
Variable overhead (1,920 x 15)	48,000	(96,000)
Contribution		54,000
Less: Fixed cost (1,920 x 13.02)		(25,000)
Net profit		29,000

Budget for actual sales	Sh	Sh
Sales (4,800 x 30)		144,000
Less		
Material	19,600	
Labour (2,020 x 15)	30,300	
Prime cost	49,900	
Variable overhead (2,020 x 25)	50,500	(100,400)
Contribution		43,600
Less: Fixed cost 2,020 x 13.02		(26,302)
Net profit		17,298

QUESTION FOUR

a) Distinguishing between job and contract costing

Job Costing	Contract Costing
This is a specific order costing where an individual job is undertaken to the customers special requirements Has a small duration eg. Furniture making	Its like job costing but its of a big magnitude and a formal contract is made between the contractor and contractee Takes a long duration e.g. Road construction

b) JENGO CONSTRUCTION COMPANY

CONTRACT ACCOUNT

	Sh		Sh.
Material delivered	1,200,000	(Material sold) C.B)	13,000
Plant delivered	400,000	Plant c/d	265,000
Payment to sub	100,000	Material c/d	20,000

contraction			
Wages paid	506,000		
Proportion of Head office costs	60,000	Cost of work to date	1,968,000
	2,266,000		2,266,000
Work done	1,968,000		
	132,000	Value of work certified	2,100,000
	2,100,000		2,100,000

Cost to completion	Sh
Additional materials	600,000
Additional wages	380,000
Additional plant	120,000
Head office expenses	15,000

	1,115,000	
Cost to date	1,968,000	
Cost to consumption	1,115,000	(3,083,000)
		917,000

% of completion = (1,977,000 ÷ 3,092,000) x 100

= 63.94%

Proportion of profit to be transferred to P&L =

2,100,000 – 1,968,000 = 132,000

QUESTION FIVE

CASH BUDGET FOR 6 MONTHS ENDING 31ST DECEMBER 1996

	July	August	September	October	November	December
Receipts	Sh. '000'	Sh. '000'	Sh. '000'	Sh. '000'	Sh. '000'	Sh. '000
Sales (W_1)	36,000	84,500	91,500	87,300	95,550	105,
Bank loan	-	-	-	-	30,000	
Total receipts	36,000	84,500	91,500	87,300	125,550	105,
Payments						
Material Purchase	-	25,000	31,000	25,500	30,600	3
Wages	10,000	12,100	10,600	25,000	22,000	2
Paid overheads	-	6,000	6,300	6,000	6,500	8,
Administration overheads	-	5,500	6,700	7,500	8,900	1

Assets	-	8,000	-	25,000	-	-
Dividend	-	-	-	-	-	35,000
Sales commission 5%	3,600	4,850	4,300	4,430	5,125	5,435
Total payments	13,600	61,450	58,900	93,430	73,125	119,435
Receipts less payments	22,400	23,050	32,600	(6,130)	52,425	(13,835)
Opening balance	72,500	94,900	117,950	150,550	144,420	196,845
Closing balance	94,900	117,950	150,550	144,420	196,845	183,010

Workings

Sales	**July**	**August**	**September**	**October**	**November**	**December**
	Sh. ‘000’	Sh. ‘000’	Sh. ‘000’	Sh. ‘000’	Sh. ‘000’	Sh. ‘000’
Sales	72,000	97,000	86,000	88,600	102,500	108,700
Cash sales	36,000	48,500	43,000	44,300	51,250	54,350

50% Credit sales	36,000	48,500	43,000	44,300	51,250	54,35
Payment by debtors	-	36,000	48,500	43,00	44,300	51,25
Add cash sales	36,000	48,500	43,000	44,300	51,250	54,35
Total receipts	36,000	84,500	91,500	87,300	95,550	105,6

QUESTION SIX

a) A Sales budget

This shows the volume of sales and the sales mix for the budgeted period. Factors to consider when preparing a sales budget:-

1. **Sales forecast** – This is what the company expects to sell in the budgeted period. This is the predicted demand of a firms products in the coming period.
2. **Production limitations** – This is the capacity of the firm. A firm may have a high demand for its products in the coming period but is production capacity can't fulfill this demand, therefore the firm should consider its production capacity.
3. **The actual sales achieved in previous periods** – Mostly the previous periods sales determine the sales in the coming period. If sales of a firm have been declining this means that there is a likely hood that the

coming periods sales will be low and vice versa.

4. **Sales orders already made** – Its important to include orders already made in forecasting sales for the period.
5. **State of the economy** – Where the state of the economy is declining, this means that the sales will be declining in the coming period and if the economy is rising, sales will increase.
6. **Market research information** – This helps to know competitors actions, change in taste and preferences of consumers, new and better advertising ideas. All these affect sales and therefore its important to consider market research information when making a sales budget.

b) **A purchase budget**

This shows the units, mix and amount to be used in purchasing of raw materials, consumables etc in making this budget we consider:-

1. **Sales forecast** – Sales determine what is to be produced and thus what is to be bought. Any change in sales, affects the amount of raw materials or goods of sales are to be bought
2. **Availability of Resources** – This is the biggest constraint and always what is to be bought and the quantity therefore when preparing a cash budget, the resources available play a central role.
3. **Available stock** – In budgeting what to buy, we must consider if the stock available is enough or we will need to purchase more. This helps to minimize the holding and ordering cost.
4. **Production budget** – The production budget shows what material is needed and when. This budget plays a crucial role in making the purchase budget.
5. **Economic conditions** – This determine how the prices of a firms raw material will vary. A stable economy makes this budget easy to prepare whereas an unstable

economy makes it difficult. Economic conditions determine the behaviour of raw material sellers, which affect the prices and the purchase budget.

QUESTION SEVEN

Purpose of advertising in respect of

a) An existing product:-

- **Off-set competitors actions** – It helps counter act and off-set competitors actions by showing the consumer that the firm's product is still the best.
- **Make sales persons more effective** – used by organizations whose significant promotional effort is personal selling eg. insurance covers. It informs buyers about the product and encourages buyers to contact sales personnel for more information.
- **To increase usage of the product** – An advertisement can be placed to show the different usage of a product e.g. dettol – clean house, body, apply on wounds etc. This increases its usage.
- **To remind the customer** – It reminds the customer that a brand is still in the market and reinforces the usage of the product by telling

current users that they have made the right choice.

- **To reduce sales fluctuations** – Advertisement reminds customers of its products and reminds them of any price reductions. This helps to increase sales.

b) A new product:-

- **Inform** – It informs consumers of the new product in the market and encourages consumers to buy it.
- **Stimulate demand** – This is called primary demand. An advertisement tries to show how the new product can solve the problems of the consumers easily and cheaply.
- **Create sales** – Advertisement helps to sell a new product. This is the main reason why advertisement is done that is to sell the new product.
- **Create loyalty customers** – Advertising a new product has an impact on the customers and may lead to them becoming loyalty customers. This will then ensure repeated purchases.

- **Make sales personnel more efficient** – After advertising a product, most people will be aware of it, this helps the sales persons as many people will not be asking them what they are selling or refuse to buy the product because they don’t know it.

MOCK EXAMINATION

To be carried out under examination condition and sent to the Distance Learning Administrator for marking by the University

Time Allowed: 3 Hours Attempt All Questions

QUESTION ONE

The following data relates to process 1 in Uzima Industries:-

	Units	Cost (Shs)
Opening work in process	2,000	67,000
Units put into process	5,000	-
Units transferred to process 2:	5,000	?

During the period, the following costs were incurred in process 1:

	Shs.	Shs.
Raw materials	2,000	147,000

Conversion Costs:		-
Labour	55,000	
Overheads	91,000	146,000
		293,000

The opening work in progress was 50% complete in respect of conversion costs.

Additional Information

i) There were 2000 units of closing work in process at the end of the period.
ii) Normal and abnormal losses are 80% complete as to conversion costs when they are detected.
iii) The closing work in process was 50% complete as to conversion costs.

After Process 1, the finished units were transferred to process 2 where the following data is relevant

	Units	Cost (Shs)
Opening work	3,0	245,00

in Process	00	0
Conversion –	-	150,00
costs: Labour		0
	-	80,000
Overheads		
Raw material		90,000
added		

5,000 units of finished goods were transferred to stores. There were no normal or abnormal losses during the process.
The closing work in process was as complete as that of Process 1. In both processes, material is added at the beginning of the process. The company uses the average method of stocks valuation.

Required

a) Process 1 and Process 2 accounts, accompanied by their relevant statements. (16 marks)
b) Valuation of the closing work in progress in both processes.
(2 marks)

c) Valuation of each unit of finished goods in Process 2
(2 marks)

(Total 20 marks)

QUESTION TWO

a) Clearly distinguish between CVP analysis and BEP analysis
(5 marks)

b) What assumptions underlie the CVP analysis? What is their effective implication?

(5 marks)

c) A firm has a contribution margin ratio of 45% and wants to earn an after task return of Sh.72,000. It operates in a 32% income tax rate bracket. It has fixed costs of Shs.120,000 per year and these cater for the marketing, administration and distribution costs.

Required

(i) Compute the sales volume that will earn the shs 72,000 after tax profits.
(3 marks)

(ii) What sales volume would earn three times the desired profit but before tax?
(2 marks)

(iii) On the basis of the above results, compile proforma income statements to verify your results in (i) and (ii)
(5 marks)

(Total: 20 marks)

QUESTION THREE

a) Explain five major features of contract costing. (10 marks)

b) A company has fixed costs made up of the following:

• Selling and Marketing costs	1,000,000
• Administration costs	2,000,000
• Rent	500,000
• Distribution costs	300,000
• Research and Development	1,000,000
• Public Relations	1,000,000

Its products are sold at shs.100 per unit. To produce each of these products, the following production costs are incurred:

Direct Materials	20.00
Direct Labour	20.00
Variable Overheads	15.50
Fixed Overheads	5.50
	50.50

Required

(i) Compute the contribution margin and therefore the contribution margin ratio. (4 marks)

(ii) Compute the break-even sales using the contribution margin ratio computed in (a) above. (3 marks)

(iii) Compute the break-even sales volume using the selling price, the sole denominator. (3 marks)

(Total: 20 marks)

QUESTION FOUR

Dynamic Limited manufactures three products X, Y and Z. All the three products pass through a common finishing section whose total machine time is 3,000 hours per month. The time requirement in finishing section for each products X, Y and Z is 20 minutes, 10 minutes and 15 minutes respectively.

The company employs budgetary control and the following is the monthly sales budget which can be considered relatively stable:

Product	Sales Revenue budget
X:	648,000
Y:	805,000
Z:	960,000
	2,431,000

The price structure relating to each product is set out as set out below:

Particulars	Product	X	Y	Z
		Shs	Shs	shs

Raw Materials	50	80	100
Direct Labour	30	70	50
Fixed Overheads	60	30	50
Profit Margin	40	50	40
Selling Price	180	230	240

Four of the available machines in the finishing section have recently been destroyed by fire limiting the available machine hours to 2100 hours which is not enough to meet the normal products demand. The replacement of these machines will need at least 18 months.

Meanwhile, the company has decided as a matter of policy to produce at least 2000 units of each product so as not to lose the market contact while utilizing the balance of the machine capacity in the most profitable manner.

However, is no case would production of any product exceed the previous production level which was determined by the existing market demand.

Required

a) The quantities of each product that the company should produce each month under the current market conditions so as to meet the requirements of its policy. (5 marks)

b) The revised budgeted profit in units and monetary values. (5 marks)

c) The original budgeted profit in units and monetary values (5 marks)

d) What is the effect of the company's policy on its profitability? Comment on the adequacy of this policy in a highly competitive market. (5 marks)

(Total: 20 marks)

QUESTION FIVE

a) Outline four main standards that an organization could employ in its standard costing system. (4 marks)

b) The following data relates to the production of product Zena in Zimali Limited for the month of December 2004:

Inputs:	Standard Quantity (units)	Standard Price (shs)	Standard Cost Limit (shs)
Materials	3 kg	4	2
Direct Labour	2.5 hours	14	35
Variable Overheads	2.5 hours	3	7.50

During the month, 6,500 kg of raw materials were purchased at shs.3.80 per kg and all the material was used to produce 2000 units of Zeena.

4,000 hours of direct labour time were used at a total cost of shs64,350. The actual variable overhead cost was Shs.13,950.

Required

(i) The Material Variances (4 marks)

(ii) Labour Variances. (4 marks)

(iii) Variable Overhead Variance (4 marks)

Show all your workings

(iv) Indicate four possible causes of unfavourable material variance. (4 marks)

(Total: 20 marks)

END OF MOCK EXAMINATION

NOW SEND YOUR ANSWERS TO THE DISTANCE LEARNING CENTRE FOR MARKING