SEMESTER-II

ଓଡ଼ିଶା ରାଜ୍ୟ ମୁକ୍ତ ବିଶ୍ୱବିଦ୍ୟାଳୟ, ସମ୍ବଲପୁର
ODISHA STATE OPEN UNIVERSITY, SAMBALPUR

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Odisha State Open University
Sambalpur

BACHELOR OF COMMERCE *(HONOURS)* (BCOM)

BCO-03: COST ACCOUNTING

Credit: 6

Block-1,2,3 & 4

BCO-03: Cost Accounting

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ODISHA STATE OPEN UNIVERSITY, SAMBALPUR

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BCO-03: COST ACCOUNTING

Contents

Block-1

INTRODUCTION TO COST ACCOUNTING

UNIT-1: CONCEPT AND PRINCIPLES OF COST ACCOUNTING

Learning Objectives:

After studying this unit, you will be able to:

- explain the meaning of cost, costing and cost accounting
- describe the scope of cost accounting
- explain role of costing as an aid to management
- explain the relationship between cost and financial accounting.

Structure

1.1 INTRODUCTION

You are aware that a business firm is formed to earn profit. For this, it has to invest money and incur expenses on various items and then generates incomes by selling goods or generating services for reasonable consideration. In these activities, therefore, cost is an important subject matter to which the firm has to take care of. This is the reason why Cost Accounting is taught in commerce and management and practiced in business firms. In this unit we will discuss the preliminaries of cost accounting covering the meaning, objectives, nature and scope of cost accounting, costing as an aid to management and relationship between cost and financial accounting.

1.2 MEANING OF COST, COSTRING AND COST ACCOUNTING

The term 'Cost' is understood in a variety of ways. In ordinary language cost means expenses. But in Cost Accounting it has special meaning. The Institute of Cost and Management Accountants, London, has defined the term as, ''the amount of expenditure, actual or notional, incurred on or attributable to a given thing''. Therefore, when we use the term cost, it must relate to certain thing. Cost is always attached to a good, or service which is consumed or used. It can be regarded as the price paid for attaining the objective.

When a manufacturer buys raw materials he pays price at a certain rate. This price paid by the manufacturer is called cost of materials. If he incurs additional expenses, e.g., freight, insurance etc., to bring the raw materials to his place of work, these are also added to the price to find out the cost of raw materials.

Thus cost represents a sacrifice of values, a foregoing or a release of something of value. It is the price of economic resources used as a result of producing or doing the thing costs. It is the amount of expenditure incurred on a given thing. Therefore, cost has been defined as ''the amount measured in money or cash expended or other property transferred, capital stock issued, services performed or a liability incurred in consideration of goods or services received or to be received''.

'Costing' is the process of ascertainment of cost. It is different from cost accounting. It is referred to as classifying, recording and appropriate allocation of expenditure for determination of the costs of products or services. It consists of rules and principles of ascertainment of costs of a product or service.

Cost accounting is a broader term. The system of accounting which is concerned with determination of costs of doing something which can be manufacturing or producing an article or rendering service or even conducting any activity or function, and keeping records of costs is called 'Cost Accounting'.

To be very precise, 'Cost Accounting' is the application of costing principles, methods and techniques in the ascertainment of costs and analysis of savings and/or expenses as compared with previous experience or with standards. Cost accounting is the technique and process of ascertainment of costs, which begins with recording of expenses or the bases on which they are calculated and ends with preparation of

statistical data.

The costing terminology of I.C.M.A. London, defines cost accounting as, ‘‘The process of accounting for costs from the point at which expenditure is incurred or committed to the establishment of its ultimate relationship with cost centres and cost units. In its widest sense, it embraces the preparation of statistical data, the application of cost control methods and the ascertainment of the profitability of activities carried out or planned.’’ Wheldon defines cost accounting as, ‘‘Classifying, recording and appropriate allocation of expenditure for determination of costs of products or services and for the presentation of suitably arranged data for purposes of control and guidance of management.’’

1.3 OBJECTIVES OF COST ACCOUNTING

After knowing the meaning of cost, costing and cost accounting, let us now explain the objectives of cost accounting. The specific objectives of cost accounting are given below:

- To ascertain cost of product or services rendered.
- To enable the cost accountant to properly value the inventory.
- To keep records of cost in a systematic manner.
- To provide necessary cost data and information to assist management in decision making.
- To provide information for planning and control through the techniques of standard costing and budgetary control.
- To indicate to the management any inefficiencies and the extent of various forms of waste, like materials, time, expenses or in the use of machinery, equipment and tools. This may indicate appropriate remedial action.
- To assist the management in fixation of selling price.
- To present comparative cost data for different periods.

1.4 SCOPE OF COST ACCOUNTING

In this section we will discuss the scope of cost accounting. Cost accounting broadly covers three subject matters. These are:

a. Ascertainment of Cost;
b. Control over Costs; and
c. Reporting or Presentation.

All these are briefly discussed below.

Cost Ascertainment:

Cost Ascertainment involves five processes. These are

i. Ascertainment of cost,
ii. Analysis of cost
iii. Deciding on absorption of cost
iv. Apportionment of cost to various units, and
v. Allocation of these costs

Cost Control:

Another scope of cost accounting is cost control. Institute of Cost and Works Accountants, London defines it as ‘‘Tool for guidance and regulation by executive action for control of cost of operating an undertaking’’. This process involves:

i. Setting up targets for expenses and activities like production, sales, purchase etc.
ii. Measuring actual expenses and volume of activities through cost ascertainment techniques;
iii. Comparison of actual result with budgeted and finding out deviations and identifying areas of efficiencies and deficiencies;
iv. Analysing the causes of deviation and fixing responsibility and
v. Taking action for improvement of performance in future.

Reporting:

The cost accountant cannot control everything that are listed above. The management will take or can authorize the cost accountant to take actions. Therefore, there is the need of reporting to the management. This function is concerned with the presentation of information obtained through cost methods and techniques of costing to the management in suitable report forms. The proper system of reporting would ensure that concerned person receives right type of information at an appropriate time. The reporting system differs from organisation to organisation, depending on peculiar needs.

1.5 EVOLUTION OF COST ACCOUNTINMG

The evolution of cost accounting as a specialised subject of study and research can be attributed to several factors. These are explained below: Earlier development of cost accounting can be credited to the mathematicians and industrial engineers, rather than accountants and managers. After industrial revolution the development of industry and system of different forms of organisation and capitalistic structure of organisation gave new dimension to accounting. This had given rise to the need for more detailed analysis of costs.

Initially, attempt was made to cover transactions concerned with movement of material within the organisation and emphasis was laid on cost ascertainment.

Towards the end of 18th century, emphasis was shifted to present costing information to management so that it can assist in planning, controlling and decision making.

The need was felt for more elaborate study in Cost Accounting in U.S.A., England and later in India. After 1st World War, the Institute of Cost and Works Accountants was set up in U.K. and National Association of Cost Accountants was set up in U.S.A. The Institute of Cost and Works Accountants was set up in India in 1944 and statutory recognition was given to it in 1959. The Companies Act amendments in 1965 brought about provisions regarding maintenance of cost accounting records in cases, where Central Government considers it necessary.

1.6 COSTING AS AID TO MANAGEMENT

You have found that one of the most important objectives of cost accounting is to provide necessary cost data and information to assist management in decision making. This objective refers to three subject matters of cost accounting of a) ascertainment of Cost; b) Control over Costs, and c) Reporting or Presentation.

Here you should remember that cost accounting is advanced stage of financial accounting and its benefits are reaped by various parties directly or indirectly concerned with the organization, viz., Management, Owners, Workers, Government, Consumers, and Lenders etc.

Now we will list some of the advantages of cost accounting to the management. Management is the first beneficiary and user of the cost accounting. The information

revealed by cost accounting aims at mainly assisting the management in decisions-making and optimising profit. The advantages to management are:

a. Management can exercise cost control and reduction measure with the help of data provided.
b. The prices of the products can be fixed and revised in a scientific manner.
c. With proper method and control over inventory, losses due handling of materials can be minimised.
d. Standard costing and variance analysis helps the management to take timely and proper measures to rectify the mistakes. This helps improvement performance.
e. Management can decide production at optimum level and utilise the plant capacity to maximum extent.
f. In case, the organisation manufactures several products, the ideal mix or combination of products can be determined.
g. Cost accounting helps to maximise profits through proper profit planning.
h. Cost accounting provides base data for quotation or tenders.

1.7 LIMITATIONS OF COST ACCOUNTING

Like any other system of accounting, Cost Accountancy is not an exact science but an art which has developed through theories and accounting practices based on reasoning and commonsense. Many of the theories cannot be proved nor can they be disproved. They grownup in course of time to become conventions and accepted principles of cost accounting. These principles are by no means static, they are changing from day to day and what is correct today may not hold true in the circumstances tomorrow.

- Large number of Conventions, Estimates and Flexible factors: No cost can be said to be exact as they incorporate a large number of conventions, estimations and flexible factors such as:

i. Classification of costs into its elements
ii. Materials issue pricing based on average or standard costs.
iii. Apportionment of overhead expenses and their allocation to cost units/centres.
iv. Arbitrary allocation of joint costs.
v. Division of overheads into fixed and variable

- Cost Accounting lacks the uniform procedures and formats in preparing the cost information of a product/service. Keeping in view this limitation, all cost accounting results can be taken as mere estimates.

1.8 INSTALLATION OF COST ACCOUNTING SYSTEM

There is no readymade cost system suitable for all the businesses. Such system has to be specially designed for an undertaking to meet its specific needs. Before installing a cost system proper care should be taken to study and taken into account all the aspects involved as otherwise the system will be a misfit and full advantages will not be realized from it. The following points should be looked into and the prerequisites satisfied before installing a cost system are:

- The nature, method and stages of production, the number of varieties and the quantity of each product and such other technical aspects should be examined. It is to be seen how complex or how simple the production methods are and what is the degree of control exercised over them.
- The designer should consider the objectives of costing system, i.e the expectations of the management
- The size, layout and organisation of the factory should be studied.
- Organisation structure should be studied to determine the manner in which costing system could be introduced, without altering or extending the organisation
- The methods of purchase, receipt, storage and issue of materials should be examined and modified wherever considered necessary.
- The wage payment methods should be studied.
- The policy adopted by the management towards cost control should be kept in view.
- The cost of the system to be installed should be considered. It is needless to emphasise that the installation and operation of system should be economic.
- The system should be simple and easy to operate.
- The system can be effectively run if it is appropriate and properly suited to the organisation.
- Forms and records of original entry should be so designed that it involve minimum clerical work and expenditure.

- The system should be so designed that cost control can be effectively exercised.
- The system should incorporate suitable procedure for reporting to the various levels of management. This should be based on the principles of exception.

Practical difficulties in installing a costing system:

Apart from the technical costing problems, the cost accountant has to face the below mentioned practical difficulties also:

a. Lack of support from top management:

In most cases cost accounting system is introduced without the support of the top management in all the functional areas. Even the managing director or chairman often introduces the costing system without consulting the departmental heads. The departmental managers treat this as interference in their work. Thus it creates a fear in the minds of the departmental managers.

b. Resistance from the existing staff:

Whenever a new system is introduced, resistance is natural as the existing staff may feel that they would lose their importance and may feel in secured of their position in the organization.

c. Shortage of trained staff:

There may be shortage of trained staff to handle the work of cost analysis, cost control, and cost reduction. The work of costing department cannot be handled without trained staff having knowledge about the overall industry in general and organization in particular.

d. Heavy cost of operating the system:

The cost of operating a system may be huge unless the costing system is properly designed according to the requirements of the each case separately. The system should be able to provide information which is required by all levels of management.

e. Non-cooperation from other staff:

The foreman, supervisors and other staff may also resent the additional paper work, which may arise because of introduction of costing system and may not cooperate with costing and other departments in providing the information which is absolutely necessary for smooth and efficient functioning of the costing system.

The person in-charge of costing department has to overcome the above mentioned

difficulties through interpersonal skills & demonstrating the expertise in installing a costing system.

1.9 RELATRIONSHIP BETWEEN COST ACCOUNTING AND FINANCIAL ACCOUNTING

In conclusion, one can say that the cost accounting takes over or begins from the stage where financial accounting ends. Financial Accounting records and summarises transactions of financial nature affected during a particular period. The information generated by financial accounting is re- cast to know cost of an activity, production or services rendered during that period as also identifying areas of weaknesses and strength and suggesting measures for improvement.

Thus, financial accounting and cost accounting are closely connected with each other, yet both the systems of accounting have certain differences which can be summed up as follows:

Distinctions between Financial Accounting and Cost Accounting

	Point of Distinction	Financial Accounting	Cost accounting
1.	Coverage	Financial Accounting dealswhole or entire matter of organisation connected with financial implication.	Cost accounting is with mainly connected with manufacturing activities.
2.	Cost basis	It is concerned withhistorical records.	It is not only concerned with historical records but also with pre-determined cost.
3.	Interested parties	Both internal and externalparties are interested including management, shareholders, creditors,	Only internal party, i.e., management is interested.

		government etc.	
4.	Purpose	The main purpose is to prepare Profit & Loss Account and Balance Sheet.	The objective is to render useful information on cost for guidance to management.
5.	Principles applied	Generally Accepted Accounting Principles are applied.	No such Generally Accepted Accounting Principles are applied.
6.	Valuationof sock	Stocks are valued at Cost or Market Value whicheveris lower.	Stocks are valued at cost.
7.	Classification of Cost	It does not classify cost into fixed and variable cost.	Makes clear classification into fixed and variable cost.
8.	Department-wise analysis	It does not give department- wise analysis. For this departmental accounts are to be prepared.	It gives department wise analysis. As such corrective measures can be taken.
9.	Legal requirements	Financial Accounts of companies are required to be kept as per the provisions of company law.	Cost accounts are kept voluntarily. Recently it has been made obligatory for some manufacturing companies.
10.	Results	Reveals amount of profit earned or loss sustained, values of assets and liabilities at the end of	Reveals costing profit or loss for the job, process or unit wise.

		accounting period.	

1.10 LET US SUM UP

In this unit, we have learnt:

- The term cost always related with certain things or goods. It also mean expresses to a given things.
- Costing consists of rules and principles of ascertainment of costs of a product or service.
- Cost account is a technique which ascertains the cost, record expenses and prepare of statistical data.
- Cost accounting broadly covers three subject matters as ascertainment of cost; control over costs and reporting or presentation.
- Cost accounting takes over or begins from the stage where financial accounting ends. Financial accounting records and summaries transactions of financial nature affected during a particular period.

1.11 REVIEW QUESTIONS

Q 1: What is Cost Accounting?

Q 2: What are the objectives of costing?

Q 3: Distinguish between costing and Cost Accounting.

Q 4: Explain the importance of Cost Accounting.

Q 5: Mention any three points of distinctions between Financial Accounting and Cost Accounting.

Q 6: Mention any four advantages of Cost Accounting to the management.

Q 7: 'Cost Accounting has become an essential tool of management'.

Comment.

UNIT-2: METHODS AND TECHNIQUES OF COSTING

LEARNING OBJECTIVES:

After studying this unit, you will be able to:

- Understand different types of Costing.
- Know the advantages and Limitations of each type of Costing.
- Know the applicability of different types of Costing.

STRUCTURE:

2.1 INTRODUCTION

Costing is the technique and process of ascertaining costs. In order to do the same, it is necessary to follow a particular method of ascertaining cost. Different methods of costing are applied to different industries depending upon the type of manufacture and their nature. Broadly the costing methods are classified into the following:

a. Specific Order Costing (Job or Terminal Costing)
b. Operation Costing or Process or Period Costing

Specific Order Costing: Specific order costing is the category of basic costing methods applicable where the work consists of separate jobs, batches or contracts each of which is authorised by a specific order or contract. It includes job costing consisting batch costing and contract costing.

Operation Costing: Operation costing is the category of basic costing method

applicable where standardised goods or services result from a sequence of repetitive and more or less continuous operations or process to which costs are charged before being averaged over the units produced during the period. In this category we include process costing and service costing.

2.2 JOB COSTING

The terminology of ICMA defines job costing as "that form of specific order costing which is applies where work is undertaken to customers' special requirements" The job is usually carried out in the factory. Each job is treated as a distinct unit and all cost incurred for the job is recorded separately.

Merits of Job Costing:

- It records costs in a more accurate and systematic manner.
- It facilitates comparison of cost of two jobs and thereby enables the management to ascertain the profitability of the jobs and accept only such jobs which are more profitable.
- It facilitates preparation of cost estimates of similar jobs.
- It facilitates better cost control through comparision of actual costs with that of the estimates.
- It facilitates easy identification and control of spoilage and defectives.
- It serves as a good basis for preparation of price quotations and tenders.

Demerits of Job Costing:

- It proves to be an expensive method of costing because all costs related to the job are accumulated and ascertained separately which involves a great deal of time, energy and money.
- The possibilities of mistakes are high as the cost of one job may be wrongly posted to another job.
- Cost comparison may not always be possible particularly when there occurs a drastic change in the economy.

Applicability: This type of costing is suitable to printers, machine tool manufacturers and furniture manufacturers, interior decorators, advertising firms etc.

2.3 BATCH COSTING

The ICMA defines it as "that form of specific order costing which applies where similar articles are manufactured in batches either for sale or for use within the undertaking. In most cases the costing is similar to job costing." In other words, it is a method of costing where the cost of a group of product is ascertained. Costs are collected according to batch order number and the total cost is divided by the numbers in a batch to find out the cost of each product.

Merits of Batch Costing:

- The burden of accounting work is considerably reduced as the batch constitutes a group of homogeneous items.
- The variations in the costs arising under this method of costing are smoothened as a result of averaging the costs. It means the total costs are spread over the articles produced by a particular batch. As such, it gives a consistent cost of production for every article produced by a particular batch.
- It can reap the benefit of reduced cost of production arising from the use of economic batch quantity.
- Under this method, the supervision can be made more effective and the supervision cost can also be minimized by spreading the same over all the units that constitute the batch. Thus, it can take care of the problem of idle time of the supervisor as well as of the workers.
- The loss of time occurring in job costing as a result of inter-transfer of materials and labour etc. is minimized under this batch costing.

Demerits of Batch Costing:

- There arises some problems with regard to determination of an ideal quantity or size for forming the batch.
- When quantity of goods to be produced differs from customer to customer, then again it creates some problem to determine the batch size.
- Another problem associated with this method is that if the production of a batch is wrongly carried out either owing to use of sub-standard materials or defective operations then the whole batch of goods will have to be discarded which is a big loss to the producer.

Applicability:

It is usually applied in general engineering factories, biscuit factories and pharmaceutical industries, ready-made garments, electronic items like TV and computers etc.

2.4 CONTRACT COSTING

Contract Costing or Terminal Costing as it is often termed, is a variant of the job costing system, which is applied in businesses engaged in building or other construction work. The jobs are usually the contracts entered into with the customers. As the number of such contracts handled at a time by a business may not be usually large, Contract Costing is comparatively simpler in operation than job costing system. The basic principles applied in Contract Costing are the same as those used in job costing except that these are modified to suit the particular requirements of the contracts.

Contract Costing is a type of costing used in constructional activities such as construction of buildings, roads, bridges etc. The person who takes contract for a price is called the Contractor and the person from whom it is taken is called the Contractee. We are mainly concerned with the books of the contractor.

To find out profit earned or loss incurred on the contract, the contractor prepares a nominal account in his books called 'Contract Account'. In this account, all the expenses incurred by the contractor are debited and the income i.e mainly work certified is credited; the difference represents profit or loss.

The items generally debited are materials, wages, establishment expenses & other expenses. Depreciation of assets used in the contract will also be debited, but unlike in other types of accounts it is customary in Contract Accounts to debit the opening balance of the assets and credit the closing balance of the same instead of depreciation, wherever it is convenient to do so. Amounts credited are work-in-progress, which consists of work certified and cost of work uncertified and any scrap of materials etc. Further some special items which are discussed here under will also be taken care of.

The contracts run for or number of years; however it is necessary to find out the profit

or loss at the end of every year. The profit earned on a Contract Account is primarily called Notional Profit and a portion of which would be kept on reserve against contingencies. The profit to be transferred to Profit & Loss Account out of notional profit is ascertained by taking into consideration the degree of completion of the work, cash received etc.

2.5 PROCESS COSTING

Process costing is that aspect of operation costing which is used to ascertain the cost of the product at each process or stage of manufacture. This method of accounting used in industries where the process of manufacture is divided into two or more processes. The objective is to find out the total cost of the process and the unit cost of the process for each and every process. Usually the industries where process costing used are textile, oil industries, cement, pharmaceutical etc.

Features of Process Costing:

a. Production is done having a continuous flow of products having a continuous flow of identical products except where plant and machinery is shut down for repairs etc.
b. Clearly defined process cost centres and the accumulation of all costs by the cost centres.
c. The maintenance of accurate records of units and part units produced and cost incurred by each process.
d. The finished product of one process becomes the raw material of the next process or operation and so on until the final product is obtained.
e. Avoidable and unavoidable losses usually arise at different stages of manufacture for various reasons.
f. In order to obtain accurate average costs, it is necessary to measure the production at various stages of manufacture as all the input units may not be converted into finished goods.
g. Different products with or without by-products are simultaneously produced at one or more stages or processes of manufacture. The valuation of by-products and apportionment of joint cost before joint of separation is an important aspect of this

method of costing.

h. Output is uniform and all units are exactly identical during one or more processes. So the cost per unit of production can be ascertained only by averaging the expenditure incurred during a particular period.

Applications of Process Costing:

The industries in which process costs may be used are many. In fact a process costing system can usually be devised in all industries except where job, batch or unit or operation costing is necessary. In particular, the following are examples of industries where process costing is applied:

Chemical works	Textile, weaving, spinning etc.
Soap making	Food products
Box making	Canning factory
Distillation process	Coke works
Paper mills	Paint, ink and varnishing etc.
Biscuit works	Meat products factory
Oil refining	Milk dairy

2.6 OPERATING COSTING/ SERVICE COPSTING

Cost Accounting has been traditionally associated with manufacturing companies. However in the modern competitive market, cost accounting has been increasingly applied in service industries like banks, insurance companies, transportation organizations, electricity generating companies, hospitals, passenger transport and railways, hotels, road maintenance, educational institutions, road lighting, canteens, port trusts and several other service organizations. The costing method applied in these industries is known as 'Operating Costing'.

According to CIMA [London] operating costing is, 'that form of operating costing which applies where standardized services are provided either by an undertaking or by a service cost center within an undertaking'.

Nature of Operating Costing:

The main objective of operating costing is to compute the cost of the services offered by the organization. For doing this, it is necessary to decide the unit of cost in such cases. The cost units vary from industry to industry. For example, in goods transport

industry, cost per ton kilometer is to be ascertained while in case of passenger transport, cost per passenger kilometer is to be computed. Cost units used in different service units are explained in detail later in chapter. The next step is to collect and identify various costs under different headings.

The headings used are:

a. Fixed or standing charges

b. Semi-fixed or maintenance charges

c. Variable or running charges.

One of the important features of operating costing is that mostly such costs are fixed in nature. For example, in case of passenger transport organization, most of the costs are fixed while few costs like diesel and oil are variable and dependent on the kilometers run.

Because of the diverse nature of activities carried out in service undertakings, the cost system used is obviously different from that of manufacturing concern. Let us discuss the method of computing costs in various service organisations.

Significance of Operating costing

i. Control of operating and running cost and avoidance of waste of fuel and other consumable material.

ii. Cost of running own vehicles may compared with the hired or other forms of transport.

iii. Facilitates quotation of hiring rates to outside parties who ask for the transport service.

iv. If transport service is treated as a separate department or service cost center, the costs to be charged to the requesting department may be easily determined.

v. Suitable information is obtained for efficient routing of vehicles.

vi. Cost of idle vehicles and lost running time is easily obtained.

2.7 UNIT COSTING AND MULTIPLE COSTING

UNIT COSTING

Unit costing is a form of process costing under which costs are accumulated and analyzed under various elements of costs and the cost per unit is ascertained by

dividing the total cost by the number of units produced.

Unit Costing is a method of costing by units of production and is adopted where production is uniform and a continuous affair, units of output are identical and the cost units are physical and natural. The cost per unit is determined by dividing the total cost during a given period by the number of units produced during that period. This method of costing is generally adopted where an undertaking is engaged in producing only one type of product or two or more products of the same kind but of varying grades or quality. The industries where this method of costing is used are collieries, sugar mills, cement works, brick works, paper mills etc. In all these cases, work is a natural unit of cost e.g., a tonne of coal, a quintal of sugar, a tonne of cement, 1000 bricks, 1 ream of paper and so on.

Some examples of Cost Unit for different products are as follows:

Product	Cost Unit
Petrol/Diesel	Per litre
Printing	Per thousand impressions
Pencil	Per dozen
Paper	Per ream
Gold	Per 10 gram/ per gram
Silver	Per kg
Iron/coal	Per tonne
Cement	Per bag

MULTIPLE (OR) COMPOSITE COSTING:

When the output comprises many assembled parts or components such as in ship building, television, motor Car or electronic gadgets, costs have to be ascertained or each component as well as the finished product. Such costing may involve different methods of costing for different components. In all the above types of industries, the product produced by them involves so many parts and components. Therefore this type of costing is known as composite costing or multiple costing.

2.9 LET US SUM UP

- The costing methods are classified into: a. Specific Order Costing (Job or Terminal Costing) and b. Operation Costing or Process or Period Costing.
- The Job costing is usually carried out in the factory.

- The Batch costing is a method of costing where the cost of a group of product is ascertained.
- The basic principles applied in Contract Costing are the same as those used in job costing except that these are modified to suit the particular requirements of the contracts.
- This method of process accounting used in industries where the process of manufacture is divided into two or more processes.

2.10 REVIEW QUESTIONS

Q 1: What do you mean by Job costing? Discuss its applicability.

Q 2: Write a brief note on Contract Costing.

Q 3: Discuss the difference between job costing and process costing.

UNIT-3: COST CONCEPTS AND ITS ASCERTAINMENT

LEARNING OBJECTIVES

After studying this unit, you will be able to:

- explain the meaning of cost
- discuss the classification of cost
- explain the various elements of costs
- describe the meaning and advantages of cost sheet
- prepare cost sheet.

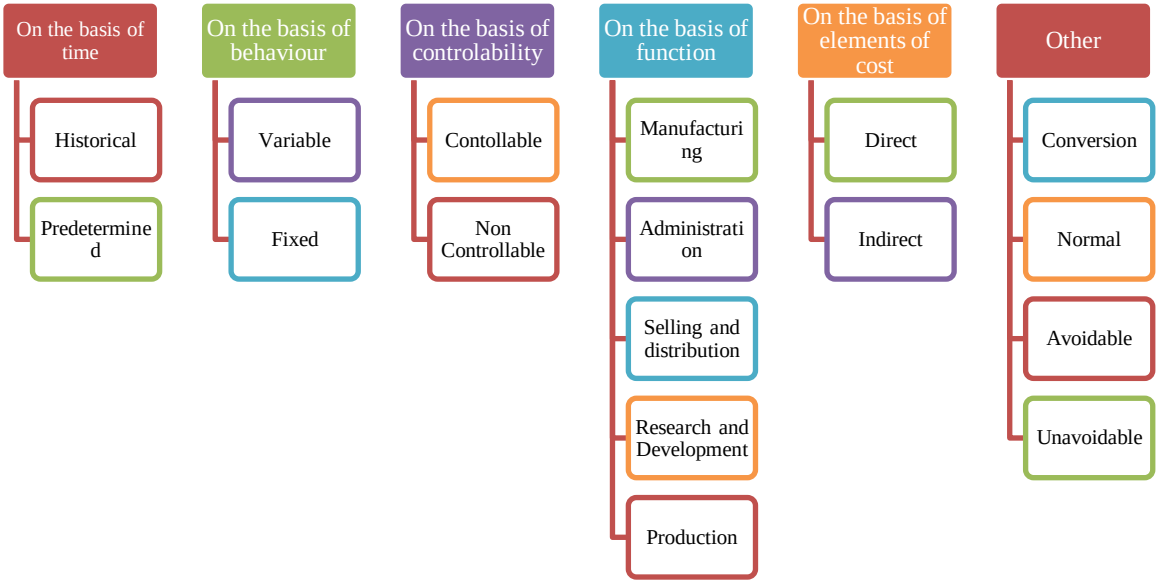
STRUCTURE

3.1 INTRODUCTION

Very often, the management desires to know, the detail nature of costs incurred and costs to be incurred. The purpose to know the cost after it is incurred and before it is incurred, might be different. It may be to keep the cost within control or it may be used for profit planning. Many times, it is required to submit tenders, to give quotations, to prepare the price lists etc. In this unit we will focus on different classes of costs and elements of costs. We will also discuss the preparation cost sheet.

3.2 CLASSIFICATION OF COST

There are different types of costs. The list of all these costs which are incurred is quite long. Therefore, these costs are classified on some basis. Cost Classification is the process of grouping costs according to their common features. Costs are to be classified in such a manner that they are identified with cost centre or cost unit. Costs are generally classified on the following basis.



Historical Cost: Historical Costs are past costs which are already incurred. These are recorded costs. These costs may be already paid or an obligation to pay in a future date as given. Example: Salary Paid, Rent Paid, Furniture Purchased, Carriage, Goods Purchased etc.

Pre-determined Cost: These are estimated costs. These costs may be budgeted cost or standard cost. For planning and decision making purpose these costs are considered. Example: Budgeted Salary, Budgeted Rent, Standard cost of Material per unit etc.

Fixed Cost: Fixed cost is that portion of the total cost which remains constant irrespective of output up to the capacity limit. It is also called period cost as it depends upon the passage of time. The amount of this cost is unaffected by variations in output. These costs provide conditions for production rather than costs of

production. They are created by contractual obligations and managerial decisions. Examples of fixed cost: Rent of Building, insurance, salaries, cost of fixed assets etc.

Variable Cost*:* Variable costs are those costs which vary in proportion to output. In other words, it is a cost which changes according to the changes in output. If the output increases, variable cost also will increase. These are generally direct costs. It is concerned with output or product. Therefore, it is called as a ‘‘product’’ cost. If the output is doubled, variable cost will also be doubled. Example of Variable Cost: Direct material Cost, Direct labour Cost, Direct expenses, Variable overheads.

Semi-variable Cost*:* Semi-variable Cost is also referred to as semi-fixed or partly variable cost. It remains constant up to a certain level and changes after point. These costs vary in some degree with volume but not in direct or same proportion. Examples of Semi-variable Cost: Repairs and maintenance of machinery, Depreciation, Supervision, Telephone charges, Maintenance of building, etc.

Controllable Cost: Controllable Costs are those costs which can be influenced by the action of manager. In formulating cost reduction measures these are used. Examples of Controllable Cost: Stationery Cost, Indirect Wages, Electricity, Telephone Expenses, Traveling expenses, etc.

Non-Controllable Cost: It is the cost which cannot be influenced by the action of manager. These costs are committed costs. Examples of Controllable Cost: Salary, Rent, Bank Interest etc.

Manufacturing cost: Manufacturing costs are related directly to production function. It is the cost of operating the manufacturing process. Examples of manufacturing cost: Direct materials, Direct labour, Direct expenses, and overheads relating to production.

Administration cost: Establishment expenses are generally called Administration costs. These are the costs which are incurred for formulating the policy, directing the organisation and controlling the operations. Examples of Administration cost: Office Rent, Stationery, Salary to office staff, Office lighting etc.

Selling and distribution cost: These are the cost which relate to sale and delivery. Distribution cost is incurred for distribution of products. Example of Selling & distribution cost: Commission to sales man, after sales expenses, Advertisements,

Market research, warehousing, Packing and cartage etc.

Research and development costs: These cost are incurred to discover new ideas, processes, and products by experiment. It includes the cost of the process which begins with the implementation of the decision to produce a new or improved product. Example of Research and development costs: Salary to Scientists and other staff engaged in research, Patent cost etc.

3.3 ELEMENTS OF COST

After discussing the classification of costs, let us now focus on Elements of Cost. Elements mean nature of items. A cost is composed of three elements: material cost, labour cost and expenses. All these three elements of cost may be direct or indirect. These are explained below.

Direct cost: It is the cost which is directly chargeable to the product manufactured. It is easily identifiable. Direct cost consists of direct material, direct labour and direct expenses. These three elements are explained below.

Direct Material: It is the cost of basic raw material used in production of a product. No finished product can be produced without basic raw materials. It becomes a part of the product. This cost is easily identifiable and chargeable to the product. For example, leather in shoe, pulp in paper, steel in steel furniture, sugarcane for sugar etc. But it is also true that raw material for one manufacturer may be finished product for another.

Direct Labour: This cost is known as direct wages and it is the amount of wages paid to those workers who are engaged in the production process for conversion of raw materials into finished goods. The amount of wages can be easily identified and directly charged to the product.

Direct Expenses: Direct Expenses are the directly chargeable expenses to the product. It can be easily identified with the product. For example, rental charges paid nor payable for a special machine used for manufacturing a product, cost of designing the product or architects fees, surveyors fees, octroi duty, royalty on production, etc.

Indirect Cost: Indirect costs are those in the total costs which cannot be identified and charged directly to the product. It has to be allocated, apportioned and absorbed over the units manufactured on a suitable basis. It consists of the three elements:

a. **Indirect Material**: These are expenses on such materials which are not visible in the product but are required to produce it. Examples of indirect materials are lubricants, grease, cotton waste, stationery etc.
b. **Indirect Labour**: It is the amount of wages paid to those workers who are not engaged on the manufacturing process.
c. **Indirect Expenses**: It is the amount of expenses which is not chargeable to the product directly. It is the cost of giving service to the production department. It includes factory expenses, administrative expenses, selling and distribution expenses etc.

3.4 MEANING OF COST UNIT

According to the terminology of ICMA (Institute of Cost & Management Accountants, London), the cost unit is defined as "a quantitative unit of product or service in relation to which costs are ascertained." In very simple words, it is a unit of finished product, service or time or combination of all these in relation to which cost is computed and expressed.

The following are some examples of cost units usually selected by different industries for calculating cost:

Name of Industries	Product/Service	Cost Unit
Cement	Cement	Per tonne
Chemical	Chemical	Per tonne, kg, litre, gallon etc
Shoes	Shoes	Per pair of shoes
Bricks Kilns	Bricks	Per 1,000 bricks.
Electricity	Electric energy, power	Per kilowatt.
Transport	Service	Per passenger km, per tonne km.
Timber	Timber	Per cubic foot.
Hotels	Service	Per room per day.
Cotton Textile	Yarn	Per kg
Printing press	Service	Per 1,000 copies

3.5 MEANING AND TYPES OF COST CENTRES

Now you are aware about the various cost units used by different industries. In this section we will discuss the concept of cost centre. A cost centre, as defined by ICMA terminology is "a location, person, or item of equipment (or group of these) in respect of which costs may be ascertained and related to cost units." A cost centre basically refers to a section of the factory for which costs are accumulated and to which costs are charged. It may be a location such as a department or a sales area, an item of equipment such as a machine, or a person such as a machine operator or a machine attendant etc. In order to facilitate charging of cost to cost units, it is necessary to divide the whole organization into several sections which can be used for accumulating cost for subsequent distribution over the cost units. So, each such section of the organization is known as cost centres. Cost centre helps in accumulating the cost, controlling the cost and its subsequent allocation to cost units.

Types of Cost Centre

Let us discuss the various cost centres-

- **Personal Cost Centre**: It consists of a person or group of persons; costs like works manager, store keeper, sales manager etc are analysed and accumulated.
- **Impersonal Cost Centre**: It is a location or item of equipment. It may represent a sales area, show room or warehouse etc while a cost centre relating to an item of equipment may be a machine or group of machines etc.
- **Operation Cost Centre**: It consists of machines which carry out some similar operations, e.g., machines and workers engaged in running various machines.
- **Process Cost Centre:** It is a cost centre where a specific process or continuous sequence of operation is carried out.
- **Production Cost Centre**: A production cost centre is one where actual production process is carried out. The manufacturing costs are charged to production cost centres.
- **Service Cost Centre**: It is a cost centre which provides service to other cost centres. Only non-manufacturing costs are charged to such service cost centres.

In creating cost centres, the following factors should be taken into account:

- ✓ The volume of work to be performed.
- ✓ The extent of cost control that can be exercised.
- ✓ Responsibilities to be identified.
- ✓ The possibilities of using the cost centre to the cost accounting department.
- ✓

3.6 COST SHEET

Cost sheet is a statement of costs where the details of cost incurred for producing a particular level of output and cost per unit within a certain period is listed. In this statement both quantity and amount are shown for each element of cost. This statement is prepared before the actual production as well as after the production. It shows the elements of cost which helps in the determination of total cost. Cost sheet is a statement which provides for the assembly of the detailed cost of a cost centre or cost unit. It is a statement showing the details of the total cost of job, operation or order. It brings out the composition of total cost in a logical order, under proper classifications and sub-divisions. The period covered by the cost sheet may be a week, a month or so. Separate columns are provided to show the total cost and cost per unit. In case of multiple products a separate cost sheet may be prepared for each product. Alternatively, separate columns of total cost and unit cost may be provided for each product in the same cost sheet. A cost sheet is prepared under output or unit costing method.

ADVANTAGES OF COST SHEET

The following are the purposes and advantages of cost sheet:

- The purpose of cost sheet is to provide detail cost information to the management. The management generally wants to know the breakup of total cost under different elements. Cost sheet serves this purpose.
- It reflects total cost as well as cost per unit.
- It helps in comparison with previous years as well as with the cost of similar product of other companies.
- It facilitates preparation of tenders or quotations.
- It enables the management to fix up selling price.

- It provides the basis for cost control and reduction.

COMPONENTS OF COST

Total Cost = Prime Cost + Factory Overheads + Administrative Overheads + Selling & distribution Overheads.

i. Prime Cost = Direct Materials + Direct Wages + Direct Expenses.

ii. Prime Cost + Factory Overheads = Works Cost or Factory Cost.

iii. Works Cost + Administrative Overheads Cost of Production or Office Cost

In some cases Works Cost or Factory Cost is termed as Cost of Production

iv. Cost of Production + Selling & distribution Overheads = Total Cost

Cost of Production (proportionate to number of units sold) + Selling & distribution Overheads = Cost of Sales Cost of Sales + Profit (- Loss) = Selling Price

Components of Direct Materials Cost:

Opening Stock of Materials + Purchases + Carriage Inwards + Custom Duty and Octroi + Dock Charges + Freight Inward

Materials Consumed = Opening Stock of Materials + Purchases – closing Stock of Materials

Components of Factory Overheads:

i. Factory Rent,

ii. Rate, Insurances;

iii. Factory Lighting

iv. Factory Supervision

v. Power

vi. Fuel & Oil, Grease, Water etc.

vii. Laboratory Expenses

viii. Depreciation of Plant & Machinery

ix. Depreciation of Factory Building

x. Repairs & Maintenance of Factory

xi. Indirect Wages

xii. Materials Handling Charges

xiii. Technical Director's Fees

xiv. Factory Stationary

xv. Salary of Works Manager, Supervisor's, Works Clerical Staff

Composition of Office and Administrations Overheads:

i. Office Rent Rate & Taxes
ii. Staff Salaries
iii. Office Lighting
iv. Office Cleaning
v. Printing & Stationery
vi. Postage & Telegram
vii. Office Conveyance
viii. Depreciation of Office Building & Furniture
ix. Office Equipments
x. Office Repairs
xi. Sundry Expenses
xii. General Expenses
xiii. Legal Expenses

PREPARATION OF COST SHEET

Cost sheet is defined by CIMA, U.K. as "a document which provides for the assembly of the detailed cost of a cost centre or cost unit." Thus cost sheet is a periodical statement of cost designed to show in detail the various elements of cost of goods produced like prime cost, factory cost of production and total cost. It is prepared at regular intervals, e.g., weekly, monthly, quarterly, yearly, etc. Comparative figures of the previous period may also be shown in the cost sheet so that assessment can be made about the progress of the business. In a typical cost sheet, cost information are presented on the basis of functional classification:

(a) Direct Material Cost
(b) Direct Labour Cost
(c) Direct Expenses
(d) Production/Manufacturing Overheads
(e) Administration Overheads
(f) Selling Overheads
(g) Distribution Overheads

Specimen Cost Sheet

Period From..... To.....		Cost Units	
Sl. No.	**Cost Items**	**Amount(Rs)**	**Amount(Rs)**
1.	**Direct Materials** **Consumed:** Opening Stock of Raw MaterialsAdd: Purchases Add: Incidental charges Less: Closing Stock of Raw Materials	 xxxxx xxxxx xxxxx (xxxxx)	 xxxxx
2	Direct Labour		xxxxx
3	Direct Expenses		xxxxx
4	**PRIME COST (1+2+3)**		**xxxxx**
5 6 7	Add: Production/Factory OverheadsAdd: Opening work in process Less: Closing work in process	xxxxxxxxxx (xxxxx)	 xxxxx
8	**FACTORY COST OR WORKS COST (4+5+6-7)**		**xxxxx**
9	Add: Administrative Overheads		xxxxx
10	**COST OF GOODS MANUFACTURED (8+9)**		**xxxxx**
11 12	Add: Opening Finished goods stock Less: Closing Finished goods stock	xxxxx xxxxx	 xxxxx
13	**COST OF FINISHED GOODS SOLD (10+11-12)**		**xxxxx**
14	Add: Selling & Distribution overheads		xxxxx
15	**COST OF SALES (13+14)**		**xxxxx**

ILLUSTRATION 01:

Prepare a cost sheet of the following information: Number of Units manufactured during the month 1,000

Direct materials consumed	**20,000**
Direct labour	8,000
Indirect labour (in factory)	2,500
Supervision costs (in factory)	1,000
Factory premises rent	1,600
Factory lighting	600
Oil for machines	100
Depreciation of machines	500
Office overheads	8,000

Office salaries	2,000
Misc. office expenses	1,000
Selling and distribution overheads	6,000

Note: A profit margin of 25% on the total cost of goods is expected on the sale.

Solution 01: **Cost Sheet (for the period)**

Particulars		Total for 1,000 units(Rs)	Per unit(Rs)
Direct materials	20,000		
consumedDirect labour	8,000		
Prime Cost		28,000	28,000
Works/Factory Overheads:			
Indirect Labour	2,500		
Supervision	1,000		
costsFactory	1,600		
Rent Factory	600		
lighting Oil for	100		
machines	500	6,300	6.30
Depreciation of machines			
Works Cost		34,300	34.30
Office and Admin. Overheads:			
Office	8,000		
overheads	2,000		
Office salaries	1,000	11,000	11.00
Misc. Expenses		45,300	45.30
Cost of Production		6,000	6.00
Selling and Distribution Overheads:		51,300	51.30
Total cost		12,825	12.82
Profit 25% of Total Cost		38,475	38.48
Sales			

3.7 LET US SUM UP

- Classification of cost means grouping of costs on the basis of their common features.
- The various bases for classification of cost are- time, behaviour, controllability, function, elements of cost etc.
- The elements of direct cost are direct material, direct labour and direct expenses.
- The elements of indirect cost are indirect material, indirect labour and indirect expenses.

- Cost sheet shows the cost incurred for producing a particular level output. It provides detailed information about the costs incurred.
- Cost sheet helps the management in controlling the cost.

3.8 REVIEW QUESTIONS

Q 1: Discuss the various classification of cost.

Q 2: Discuss the elements of indirect cost.

Q 3: What is cost sheet? Sate two advantages of cost sheet.

Q 4: Write short note-

a. Fixed cost
b. Controllable cost.
c. Administration cost.

UNIT-4: JOB COSTING AND BATCH COSTING

LEARNING OBJECTIVES

After studying this unit, you will be able to:

- Understand the job costing.
- Know the procedure for job costing.
- Know how the report of job costing is prepared.
- Know the concept of Economic batch costing.

STRUCTURE

4.1 JOB COSTING

Industries which manufacture products or render services against specific orders as distinct from continuous production for stock or sales use the job costing or job order method of cost accounting. The method is also known under various other names, such as specific order costing, production order costing, job lot costing or lot costing. Every order in job costing is separate and it is not essential that the same manufacturing operations be carried out or the same materials be utilized in respect of each. However, a number of identical orders or identical products may be combined together to form lots or batches, each such lot or batch constituting a job order. In the job costing system, an order or a unit, lot, or batch of a product may be taken as a cost unit, i.e. a

job.

In job costing, there is no averaging of costs except to the extent that in the ascertainment of unit cost, the cost of a lot of products in one order is obtained. A job or an order may extend to several accounting periods and job costs are, therefore, not related to particular periods.

Job cost accounting is followed in three types of manufacturing organisations:

i. Jobbing concerns.
ii. Small firms.
iii. Large enterprises manufacturing a variety of products.

Jobbing concerns:

Some concerns manufacture a variety of products according to customer's specifications and do not generally confine their activities to producing uniformly any specific product for sale in the market. The jobs, products or services are dissimilar or unique and non-repetitive having different specifications and methods of manufacture, and each one requires different types, sizes and quantities of materials and equipments and utilizes different labour hours. Such concerns must of necessity to use job cost accounting.

Small firms:

Though manufacturing a number of specific products, small manufacturing concerns may find process costing difficult to apply because due to small sales, no product can have a run long enough to establish a product line. On account of the frequent changes from one product to another, job costing would be suitable for determining the cost of each lot of products.

Large enterprises manufacturing a variety of products:

A single department would be manufacturing several products, perhaps all at a time, so that none of the departments is specialized for continuous runs of product lines. As definite process departments cannot be established, job costing is more suitable in such cases.

Job costing is applicable to engineering concerns, construction companies, ship-building, furniture making, hardware and machine manufacturing industries, repair shops, automobile garages and several such other industries where jobs or orders can

be kept separate.

4.2 PROCEDURE FOR JOB COSTING

On receipt of an order from the customer or an indication from the sales department for manufacturing a particular product, the production planning department prepares a suitable design for the product or job. It also works out the requirements of materials for the product and prepares a list of operations indicating the various operations to be carried out and their sequence, and the shops, departments, plants or machines to be entrusted with each of the operations.

A Production Order is issued giving instructions to the shops to proceed with the manufacture of the product. The production order constitutes the authority for work. Usually a production order contains all relevant information regarding production, such as detailed particulars of the job or product, the quantity or units to be manufactured, date of start of production, probable date of completion, details of materials required as per the bill of materials, the operations and the various shops involved in performing them and the route of the job should take.

The production order usually lays down only the quantities of materials required and the time allowed for the operations, but the values of materials and labour are also sometimes indicated. In the latter case, the production order serves the combined purpose of an order for manufacture as well as the cost sheet on which the cost of the order is compiled.

The production order also provides for the material and labour on account of normal wastage or spoilage of the product in the final stage or during the various stages of manufacture.

Production orders may, in general, be of three types:

i. Assembly type of order.
ii. Sub-assembly type of order.
iii. Components or parts production type.

Assembly type of order:

Where components are purchased and assembled into a product in the factory. A production order for assembly only is required.

Sub-assembly type of order:

Components are purchased and sub-assemblies and assemblies are made in the factory. Production orders for each sub-assembly and final assembly will be necessary.

Components or parts production type:

Components are manufactured and sub-assembled and the sub-assemblies are assembled into the final product. Separate production orders for each component, sub-assembly and final assembly are issued.

***Copies of Production Orders May be Distributed as Follows**:*

a. One copy to the stores for provisioning and issue of materials on demand.
b. One copy each to the departments or shops concerned to undertake production by demanding materials and employing men and machines on the operations.
c. One copy to the cost department for working out the cost of the job.

Separate job cost sheets are maintained for each job. If a job consists of several major or important operations, separate cost sub-sheets for recording the costs of the various operations may be maintained and the aggregate cost, in summary, shown in the main cost sheet.

Material Cost:

On receipt of a production order, the shop draws the requisite materials from the stores. Surplus, excess or incorrect materials are returned from the shops to the stores on materials return notes. Scrap and waste arising in the course of manufacture are returned in a similar manner. The materials requisitions, materials return notes and materials transfer notes are 'costed' in accordance with the methods of pricing adopted by the concern.

Labour Cost:

Labour summaries or wages analysis sheets are prepared for each accounting period and the totals of these statements are debited to Work-in-Progress Account or Overhead Control Account by credit to Wages Control Account. Amounts on account of overtime, idle time, shift differential and fringe benefits may also be included in the wages analysis sheet. Direct labour costs are posted on the respective cost sheets and indirect labour is treated in the manner indicated for indirect material.

Manufacturing Overhead:

Overhead costs are accumulated against standing order numbers and against cost

centres. Overhead rates, predetermined or actual as the case may be, are worked out for each such centre. The overhead applied to each job is obtained by multiplying the overhead rate by the actual base variable spent on the job.

Completion of Jobs:

Postings of direct material, direct labour, direct expenses and manufacturing overhead costs to the cost sheet for a job or production order are made periodically throughout the run of the job or order. The completion report is an indication that the manufacturing operations are over and further expenditure on the job should cease so that the cost sheet may not be closed.

Work-in-Progress:

The cost of an incomplete job i.e., a job on which some manufacturing processes or operations are still due before it can be made into the finished product is termed Work-in-Progress or Work-in-Process. If a production order has been only partly completed by the end of an accounting period, it is essential that the closing stock of the work-in-progress be determined.

Cost Control in Job Order System:

Control over job costs may be exercised by comparison of the actual costs with the estimated costs established as basis for fixing job prices. Here again, adequate cost control is available for direct material and direct labour only; overhead costs cannot be controlled in terms of individual jobs. Control of overhead is, therefore, confined to the department as a whole for which predetermined overhead rate has been determined.

Comparison may also be made with the costs of previous periods or of earlier batches of production, if any.

Standard costs may be used in job type plants, particularly where the product or the particular operations of the job are of a standardised nature.

4.3 REPORTS IN JOB COSTING

Report on profits on completed jobs:

A statement may be prepared monthly to indicate the gross profit earned on all jobs completed during the month. This statement is useful for the management for evaluating past performances. Net profit analysis may also be made in a similar manner if administration, selling and distribution overheads for the job are included in the

statement.

Report on cost variances:

If cost estimates are developed, a cost variance report showing the deviations of actual costs from the estimated costs may be prepared in order that significant differences may be brought to light and investigated. The report may be prepared separately for a job, or for a department showing the variances in respect of all jobs undertaken by the department during a period.

Illustration 01: As newly appointed Cost Accountant, you find that the selling price of Job No. 9669 has been calculated on the following basis:

Particulars	`
Materials	12.08
Direct Wages – 22 hours at 25 paise per hour	5.50
Department A – 10 hours,	
B – 4 hours	
C - 8 hours	
	17.58
Plus 33% on Prime Cost	5.86
	23.44

An analysis of the previous year's profit and loss account shows the following:

Particulars	`	Particulars	`
Materials Used	77,500	Factory Overheads:	2,500
Direct Wages:	5,000	A	4,000
A	6,000	B	1,000
B	4,000	C	30,000
C		Selling Costs	

You are required to:

a. Draw up a Job Cost Sheet;

b. Calculate and enter the revised costs using the previous year's figures as a basis;

c. Add to the total job cost 10% for profit and give the final selling price.

Solution 01:

In order to draw up Job Cost Sheet, the factory overhead rates of different departments and percentage of selling cost will have to be determined first on the basis of previous year's figures as follow:

Factory Overhead Rates:

Particulars	Department		
	A	B	C
	`	`	``
Factory Overheads	2,500	4,000	1,000
Direct Labour Hours (D.W. x 4)	20,000	24,000	16,000
Factory Overhead Rates per hour	0.125	0.167	0.063

Percentage of Selling Cost on Works Cost = $\frac{` 30,000}{` 1,00,000}$ = 30%

Cost Sheet

Job No. 9669			Period
Particulars			`
Materials			12.08
Direct Wages:			
Dept. A		2.50	
Dept. B		1.00	
Dept. C		2.00	5.50
Prime Cost			17.58
Factory Overheads:			
Dept. A	(10 hours. @ ` 0.125)	1.25	
Dept. B	(4 hours. @ ` 0.167)	0.67	
Dept. C	(8 hours. @ ` 0.063)	0.50	2.42
Works Cost			20.00
Selling Cost (30% of Works Cost)			6.00
Cost of Sales			26.00
Profit (10% on Cost)			2.60
Selling Price			28.60

Illustration 02:

A work order for 100 units of a commodity has to pass through four different machines of which the machine hour rates are: Machine P – ` 1.25, Machine Q – ` 2.50, Machine R – ` 3 and Machine S – ` 2.25

Following expenses have been incurred on the work order – Materials ` 8,000 and Wages ` 500.

Machine - P has been engaged for 200 hours. Machine - Q for 160 hours, Machine - R for 240 hours and Machine - S for 132 hours.

After the work order has been completed, materials worth ` 400 are found to be surplus and are returned to stores.

Office overhead used to be 40% of works costs, but on account of all-round rise in the cost of administration, distribution and sale, there has been a 50% rise in the office overhead expenditure.

Moreover, it is known that 10% of production will have to be scrapped as not being up to the specification and the sale proceeds of the scrapped output will be only 5% of the cost of sale.

If the manufacturer wants to make a profit of 20% on the total cost of the work order, find out the selling price of a unit of commodity ready for sale.

Solution 02: **Statement showing the selling price of a unit**

Particulars		`
Materials used (` 8,000 – `400)		7,600
Direct Wages		500
Prime Cost		8,100
Works Overhead at machine hour rate:		
Machine - P For 200 hours @ ` 1.25 per hour	250	
Machine - Q For 160 hours. @ ` 2.50 per hour	400	
Machine - R For 240 hours. @ ` 3 per hour	720	
Machine - S For 132 hours. @ ` 2.25 per hour	297	1,667
Works Cost		9,767
Administration Overhead at 60% of works cost		5,860
		15,627
Less: Sale proceeds of Scrap (5% of 10% of ` 15,627)		78
Total Cost of the work order		15,549
Profit at 20% of total Cost		3,110
Selling Price of 100 units		18,659
Selling Price of a unit		186.59

Note: It was known before that 10% of production will have to be scrapped, therefore, inputs must have been made taking this factor into consideration. No other adjustment is necessary except deducting the value of scrap from the cost of production.

Illustration 03: The data pertaining to Heavy Engineering Ltd. using are as follows at the end of 31.3.2012. Direct material` 9,00,000; Direct wages ` 7,50,000; Selling and distribution overhead ` 5,25,000; Administrative overhead ` 4,20,000, Factory overhead ` 4,50,000 and Profit ` 6,09,000.

a. Prepare a cost sheet showing all the details.

b. For 2012-13, the factory has received a work order. It is estimated that the direct materials would be ` 12,00,000 and direct labour cost ` 7,50,000. What would be the price of work order if the factory intends to earn the same rate of profit on sales, assuming that the selling and distribution overhead has gone up by 15%? The factory recovers factory overhead as a percentage of direct wages and administrative and selling and distribution overheads as a percentage of works cost, based on the cost rates prevalent in the previous year.

Solution 03: **Statement of cost and profit**

Particulars	`
Direct Materials	9,00,000
Direct Wages	7,50,000
Prime Cost	16,50,000
Factory Overheads (60% of wages)	4,50,000
Works Cost	21,00,000
Administration Overhead (20% of works cost)	4,20,000
Cost of Production	25,20,000
Selling & Distribution Overheads (25% of Works Cost)	5,25,000
Cost of Sales	30,45,000
Profit (1/5 of Cost)	6,09,000
Sales	36,54,000

Estimated price of work order

Particulars	`
Direct Materials	12,00,000
Direct Wages (or labour)	7,50,000
Prime Cost	19,50,000
Factory Overheads (60% of wages)	4,50,000
Works Cost	24,00,000
Administration Overhead (20% of works cost)	4,80,000
Cost of Production	28,80,000
Selling & Distribution Overheads	
(40% i.e., 25 % + 15% of Works Cost)	9,60,000
Total Cost	38,40,000
Profit (1/5 of Total Cost)	7,68,000
Estimated Sales price	46,08,000

Illustration 04:

A manufacturing company is divided into three production departments – A, B and C. All production is to customers' orders. All orders are dissimilar and they go through all the three departments. Manufacturing Costs for a given period were as follows:

Particulars	Dept A	Dept B	Dept C	Total
	`	`	`	`
Direct material				1,80,000
Direct labour	40,000	20,000	30,000	90,000
Indirect manufacturing costs	20,000	40,000	30,000	90,000

The cost of producing a particular order was determined as follows:

Particulars	`	`
Direct material		1,000
Direct Labour:	`	
Department A	120	
Department B	280	
Department C	200	600
Indirect manufacturing Costs		600
		2,200

The General Manager had a hazy idea that the jobs executed on orders of this nature are underpriced. So, the services of a firm of cost accountants, of which you are a member, have been acquired for a thorough investigation.

Can you detect, after a careful perusal of the limited available information, the fundamental fallacy of the company's method assuming that the direct labour cost is an acceptable basis for distributing indirect manufacturing costs?

Prepare a revised cost for order distributing indirect manufacturing costs in a manner you consider more correct than the company's procedure.

Solution 04:

The predominant fault is the adoption of a blanket rate for the distribution of the indirect manufacturing costs for all the three departments, i.e., 100% of total direct labour cost. This has been done despite of the fact that there are glaring differences of the direct labour cost of three departments. For calculating the revised cost of jobs, departmental rates based on indirect manufacturing cost percentage to direct labour costs are calculated:

Particulars	Departments		
	A	B	C
Indirect Mfg. Cost (`)	20,000	40,000	30,000
Direct Labour (`)	40,000	20,000	30,000
% of Mfg. Cost to Labour Cost (1/2) x 100	50%	200%	100%

On the assumption that direct labour cost method is considered to be a reasonable method of absorption of overheads, it is quite possible that departmental application of overhead may be able to resolve the difficulty faced by the manager regarding the costing of the job given. On this basis the amended job cost sheet will be as under:

Revised Cost of Job

Particulars		`	`
Direct Materials (Given)			1,000
Direct Labour:			
Dept. A		120	
Dept. B		280	
Dept. C		200	600
			1,600
Indirect Manufacturing Cost: (Revised)			
Dept. A	50% of Direct Labour	60	
Dept. B	200% of Direct Labour	560	
Dept. C	100% of Direct Labour	200	820
Total Cost			2,420

4.4 BATCH COSTING

Batch Costing is applied in those industries where the similar articles are produced in definite batches for internal consumption in the production of finished products or for sale to customers generally. It is generally applied in –

- Read made Garments Manufacturing Industries
- Pharmaceutical/ Drug Industries
- Spare parts and Components Manufacturing Industries
- Toys Manufacturing Industries
- Tyre and Tubes Manufacturing Industries.

4.5 ECONOMIC BATCH COSTING

Economic Batch Quantity refers to the optimum quantity batch which should be produced at a point of time so that the Set up & Processing Costs and Carrying Costs

are together optimized.

Setting up & Processing Costs

The setting up and processing costs refer to the costs incurred for setting up and processing operations before the start of production of a batch. There is an inverse relationship between batch size and set up & processing costs.

Large the Batch size: Lower the set up costs because of few batches

Smaller the Batch Size: Higher the set up costs because of more batches

Carrying Costs

The carrying costs refer to the costs incurred in maintaining a given level of inventory. There is positive relationship between batch size and carrying costs.

Large the Batch size: Higher the carrying costs because of high average inventory

Smaller the Batch Size: Lower the carrying costs because of low average inventory

Trade off

The optimum quantity of batch which should be produced at a point of time determined after achieving a tradeoff between set up costs and carrying costs. Such batch size is known as EBQ because annual total cost of set up and carrying is minimum at this batch size.

FORMULA

$$\textbf{E.B.Q} = \frac{\sqrt{2AS}}{C}$$

Where, E.B.Q = Economic Batch Quantity

A = Annual Demand

S = Set up Cost per batch

C = Carrying Costs per unit per year

Illustration 05:

From the following information, calculate Economic Batch Quantity for a company using batch costing:

Annual Demand for the components	2400 units
Setting up cost per batch	` 100
Manufacturing cost per unit	` 200
Carrying cost per unit	6% p.a.

Solution 05:

EBQ = $\sqrt{\frac{2AS}{C}} = \sqrt{\frac{2*2400*100}{6\%\ OF\ 200}}$ = 200 UNITS

Illustration 06:

A customer has been ordering 60,000 special design metal columns at the columns at the rate of 18,000 per order during the past years. The production cost comprises `120 for material, ` 60 for labour and ` 20 for fixed overheads. It costs ` 1500 to set up for one run of 18,000 column and inventory carrying cost is 15% since this customer may buy at least 5000 columns this year, the company would like to avoid making five different production runs. Find the most economic production run.

Solution 06:

Economic Production Run = $\sqrt{\frac{2*ANNUAL\ OUTPUY*SET\ UP\ COST\ PER\ PRODUCTION\ RUN}{INVENTORY\ CARRYING\ COST\ PER\ UNIT\ P.A.}}$

= $\sqrt{\frac{2*90000*1500}{30}}$ = 30000 UNITS

Illustration 07:

AB Ltd.is committed to supply 24,000 bearings per annum to CD Ltd. On a steady basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and that the set-up cost per run of bearing manufacture is ` 324.

a. What would be the optimum run size for bearing manufacture?
b. What is the minimum inventory holding cost at optimum run size?
c. Assuming that the company has a police of manufacturing 6000 bearing per run, how much extra costs would the company be incurring as compared to the optimum run suggested in (a)?

Solution 07:

(a) Optimum production Run Size (Q) = $\sqrt{\frac{2AO}{C}} = \sqrt{\frac{2*24000*324}{0.1*12}}$ = 36000 units

(b**)** Minimum inventory Holding Cost, if run size is 3600 bearings

= Average inventory x carrying cost per unit

= (3600/2) x (.10 x 12) = ` 2160

(c) Statement showing Total Cost at Production Run sizes of 3600 and 6000 bearings

A.	Annual requirements	24000	24000
B.	Run size	3600	6000
C.	No. of runs (A/B)	6.667	4
D.	Set up cost per run	` 324	` 324
E.	Total set up cost (C X D)	` 2160	` 1296
F.	Average inventory(B/2)	1800	3000
G.	Carrying cost per unit p.a.	1.20	1.20
H.	Total carrying cost (F x G)	2160	3600
I.	Total cost (E + H)	4320	4896

Extra cost incurred, if run size is of 6000 = ` 4896 – ` 4320 = ` 576

Illustration 08:

Component 'Gold' is made entirely in cost centre 100. Material cost is 6 paise per component and each component takes 10 minutes to produce. The machine operator is paid 72 paise per hour, and machine hour rate is ` 1.50. The setting up of the machine to produce the component 'Gold' takes 2 hours 20 minutes.

On the basis of this information, prepare a cost sheet showing the production and setting up cost, both in total and per component, assuming that a batch of:

a. 10 components,

b. 100 components, and

c. 1000 components is produced.

Solution 08:

Cost Sheet Component 'Gold'

Particulars	Batch Size					
	10 components		100 components		1000 components	
	Total `	Per component `	Total `	Per component `	Total `	Per component `
A. Setting up Cost:						
Machine Operators wages (2 hours 20minutes @ `72 p.h)	1.68	0.168	1.68	0.0168	1.68	0.00168
Overheads 2 hours 20minutes @ `1.50 p.h)	3.50	0.350	3.50	0.0350	3.50	0.00350
B. Production Cost:						
Material Cost @ Re. 0.06 per component	0.60	0 .060	6.00	0.0600	60.00	0.06000
Machine Operators Wages [(Refer to Working Note (i)]	1.20	0.120	12.00	0.1200	120.00	0.12000
Overheads						

[(Refer to Working Note (ii)]	2.50	0.250	25.00	0.2500	250.00	0.25000
C. Total Cost : (A + B)	9.48	0.948	48.18	0.4818	43518	0.43518

Working Notes:

	10 Components	100 Components	1000 Components
i) Operators Wages Time taken in minutes by machine operators and machine @10minutes per component Operators Wages @ ` 0.72 per hour (`)	100 [100/60 x 0.72]	1000 [1000/60 x 0.72]	1000 [10000/60 x 0.72]
ii) Overhead expenses	2.50	25.00	250.00
Total overhead expenses			
@ ` 1.50 per Machine hour	[100/60 x ` 1.50]	[1000/60 x `1.50]	[10000/60x` 1.50]

Illustration 09:

Pink Limited undertakes to supply 1000 units of a component per month for the months of January, Feb. and March 20X1. Every month a batch order is opened against which materials and labour cost are booked at actual. Overheads are levied at a rate per labour hour. The selling price is contracted at `15 per unit.

From the following data, present the cost and profit per unit of each batch order and the overall position of the order for the 3000 units.

Month	Batch Output(Numbers) `	Material Cost `	Labour cost `
January 20X1	1250	6250	2500
February 20X1	1500	9000	3000
March 20X1	1000	5000	2000

Labour is paid at the rate of ` 2 per hour. The other details are:

Month	Overheads	Total Labour Hours
January 20X1	`12000	4000
February 20X1	`9000	4500
March 20X1	`15000	5000

Solution 09:

Statement of Cost and profit per unit of each Batch

Particulars	January	February	March	Total
A. Batch output (Nunber)	1250	1500	1000	3750
B. Sales Value (A x ` 15)	` 18,750	` 22,500	` 15,000	` 56,250
C. Material	6,250	9,000	5,000	20,250
Wages	2,500	3,000	2,000	7,500
Overheads	3,750	3,000	3,000	9,750
Total Cost	12,500	15,000	10,000	37,500
D. Profit per batch (B-C)	6,250	7,500	5,000	18,750
E. Cost per Unite (C/A)	10	10	10	10
F. Profit per Unite (D/A)	5	5	5	5

Working Notes:

Particulars	Jan. 20X1	Feb. 20X1	March 20X1
A. Labour Hours (Labour Cost/ Labour rate per hour	` 2500/2 = 1250	` 3000/2 = 1500	` 2000/2 = 1000
B. Overheads per hour (Total overheads/ Total Labour Hours)	` 12000/4000 = ` 3	` 9000/4 = ` 2	`15000/5000 = ` 3
C. Overheads for the batch (A x B)	` 3750	` 3000	` 3000

Particulars	`
A. Sales Value (3000 units x ` 15)	45,000
B. Less: Total cost (3000 units x ` 10)	30,000
Profit (A- B)	15,000

4.6 LET USSUM UP

- Industries which manufacture products or render services against specific orders as distinct from continuous production for stock or sales use the job costing or job order method of cost accounting.

- Production orders may be of three types:

i. Assembly type of order.

ii. Sub-assembly type of order.

iii. Components or parts production type.

4.7 REVIEW QUESTIONS

Q 1: Explain the procedure of Process costing.

Q 2: What do you mean by Economic batch quantity? Explain with an example.

Block-2

ACCOUNTING FOR MATERIAL

Unit-5: Concept and Techniques of accounting for material

Unit-6: Methods of pricing of materials issues

Unit-7: Treatment of material losses

Unit-8: Techniques of material control

UNIT-5: CONCEPT AND TECHNIQUE OF ACCOUNTING FOR MATERIAL

LEARNING OBJECTIVES

After studying this unit, you will be able to:

- explain the meaning of Material
- explain the meaning of Material control
- describe the Qualitative and Quantitative techniques of Material control.

STRUCTURE

5.1 INTRODUCTION

You are aware that to produce something, materials are required. In other words, the first requirement in production process of an item is material. Materials are an essential element of cost. In most cases cost of materials constitutes significant portion of total cost. The entire process of manufacture would be disrupted or even stopped if right type of material is not available in the right quantity at right time. If this function is not performed properly the entire production process would be affected and other resources like men and machine would remain idle. Material Control function is aimed to ensure smooth production process. Moreover, the Costing Department has an important function to discharge in the context of materials. This function relates to the following:

a. Pricing the Receipts of materials and
b. Pricing the Issues of materials.

These two are important functions because the selling price is to be fixed for the finished product on the basis of prices of materials and therefore, the profit is influenced by the material prices. For this reason the quantity has to be valued or priced properly.

5.2 MEANING OF MATERIAL

Material is the basic element of a production function. The principal material used for manufacturing a product is called raw material. It becomes a part of the product. No finished product can be manufactured without raw materials. It is easily identifiable and chargeable to the product. For example, steel in steel furniture production, sugarcane for sugar production, wheat in bread production are the basic raw materials.

What is raw material for one manufacturer may be finished product for another. In costing, the principal material used for manufacturing is called 'Direct material'. It generally includes the following:

1. All materials specially purchased for production or the process.
2. All components purchased for production or the process.
3. Material transferred from one cost centre to another or one process to another.
4. Primary packing materials, wrappings, cardboard boxes etc., necessary for preservation or protection of product.

Examples of Direct Materials are wood for wooden furniture, limestone for cement, bamboo or soft wood for paper etc.

Other materials used for manufacturing are called Indirect Materials. Examples of Indirect Materials are lubricant, cotton, brush, wash cloth etc.

5.3 MEANING AND OBJECTIVE OF MATERIAL CONTROL

Let us now focus on another important aspect of material. It is material control. Material control is a function which can be termed as systematic control over purchasing, storing and using material in a manufacturing organisation. Thus, material control is the art and science of maintaining the material level of a given group of items, incurring the least total cost, consistent with other relevant targets

and objectives set by the management.

The objective of material control is to maintain a regular supply of materials as and when they are needed and avoiding at the same time excessive holding of stock of materials.

This function is steered to ensure that right type of material is made available in right quantity at right time for production and other activities of the organisation. Since materials constitute a significant percentage of working capital, it must be regulated in the right direction so that costs can be minimised to maintain a reasonable rate of profit. To perform this function, it is essential that some material must be held in balance to be used without delay. The holding of such material as stock also involves blocking of funds and also other risks of loss or damage or obsolescence. Material Control aims to minimise this risk also.

5.4 ESSENTIALS OF MATERIAL CONTROL PROCEDURE

To establish a sound material control system certain conditions should be ensured in the organisation. Some of these conditions are given below.

i. Centralised purchasing organisation under authority of competent person,
ii. Co-ordination between related departments particularly production, purchase, inspection, stores and accounts,
iii. Proper storage of all materials,
iv. There should be effective system of internal check,
v. There should be use of standard printed forms for requisitions, order placing, goods receipt, inspection report, and issue for consumption and stock records.

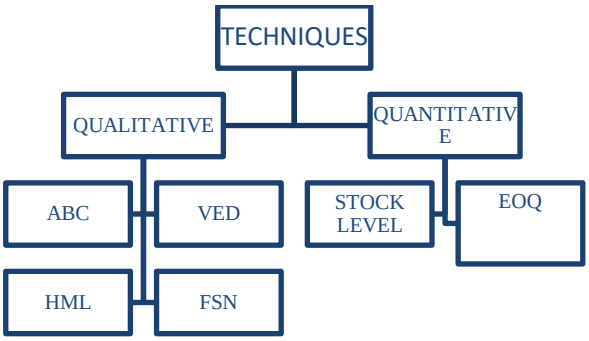
5.5 TECHNIQUES OF MATERIAL CONTROL

Material control techniques can be grouped into two categories:

(i) Qualitative techniques and

(ii) Quantitative techniques.

These are briefly explained below.



QUALITATIVE TECHNIQUES: In qualitative techniques the following are generally applied depending upon the degree of control required.

a. A.B.C. Analysis: This is also known as, ''Always Better Control Analysis'' technique. It enables the management to decide the degree of control necessary and is based on ''management by exception'' principle.

b. V-E-D Classification: Classification done on the basis of criticality of the item is known as V-E-D, where the items are classified as Vital, Essential and Desirable.

c. HML Analysis: In this technique materials are classified on the basis of cost or value. Materials which are of the highest value are classified as 'H' Items, materials which are of the medium value are classified as 'M' Items and materials which are of the low value are classified as 'L' Items, and accordingly control over the materials is exercised.

d. F – S – N Analysis: In this technique materials are classified on the basis of movement or frequency of use Materials which are frequently used are FAST moving items, materials which are not used frequently are SLOW moving items, and materials which are rarely used are NON moving items, and accordingly control over the materials is exercised.

e. S – D – E Analysis: In this technique materials are classified on the basis of availability. Materials which are scarce are S category items moving items, Materials which are difficult to procure are D category items and Materials which are easily available are E category items and accordingly control over the materials is exercised.

QUANTITATIVE TECHNIQUES

a. Stock Level: This technique is applied to fix stock levels in terms of quantity to ensure proper control so as to ensure that optimum quantity of materials is bought

and stored. It also answers question when to buy? And assists the management to budget and prepare time schedule of purchases. The technique requires fixation of stock level in respect of every type of material.

b. Economic Order Quantity: The economic order or re-order quantity is the predetermined fixed quantity of materials to be purchased to minimise the total cost involved in the purchase and storage of the materials. This technique helps to determine how much to buy. There are different inventory models to determine how much to buy.

5.6 LET US SUM UP

- The principal material used in production of a product is called raw- material.
- The principal material used for manufacturing is called direct material.
- The material which facilitates the production process is called indirect material.
- Material control refers to a systematic procedure of purchasing, storing and using materials in a manufacturing concern.
- Efficient material control helps the company to run the production process smoothly and relives the company of holding excessive stock of materials.
- The techniques of material control are broadly divided into qualitative and quantity techniques.

5.7 REVIEW QUESTIONS

Q 1: Mention the functions of Purchase Organisation.

Q 2: What are the considerations that guide the quantity of materials to be purchased?

Q 3: Explain the meaning and objective of material control.

Q 4: Describe any two quantitative techniques of material control.

UNIT-6: METHODS OF PRICING OF MATERIAL ISSUES

LEARNING OBJECTIVES

After studying this unit, you will be able to:

- Understand the meaning of pricing of material Issues.
- Know the most important and useful methods of issue of material
- Maintain store Ledger Account

STRUCTURE

6.1 MEANING

Materials purchased are kept in stores and issued to different jobs or work orders. These jobs or work crders are charged with the cost of materials issued to them. This is called pricing of material issues.

Prices paid for purchases made at different times may be different. While issuing these materials, it is essential to consider the price at which it should be charged to jobs or work orders.

There are different methods of pricing materials issues. The selection of a proper method of pricing of material issues depends on many factors e.g.

1. Nature of business.
2. Frequency of purchase of materials
3. Durability of stock
4. Length of inventory turnover period
5. Range of price fluctuations etc.

6.2 FIRST IN FIRST OUT (FIFO)

This method of pricing the issues is based on the assumption that the materials purchased and received first in store are issued first to the job. It means the materials are issued in the order in which they are received. The price of the earliest lot of purchase is taken first and when that is exhausted, the price of the next lot of purchase is adopted and so on. In other words, the materials are issued at the oldest cost price. The closing stock is valued at latest or current price.

This method is suitable when prices are falling. It is also useful if transactions are few and prices of material remain stable. In case of perishable materials this method is best applicable.

Advantages:

i. It is simple to understand and easy to operate.
ii. It is based on logical and sound principle that materials are issued in order of purchase.
iii. The closing stock is valued at a more recent price.
iv. Materials are priced at actual cost hence no unrealised profit or loss arises.
v. Deterioration and obsolescence can be avoided by exhausting oldest materials at the time of issue.

Disadvantages:

i. The calculation becomes difficult and complicated when purchases are made very frequently at different prices.
ii. Issue price does not reflect current market price.
iii. Cost of production tends to be high during the period of falling prices.
iv. The pricing of material returns is difficult.
v. Cost comparison between two similar jobs becomes difficult when issues are priced differently.

6.3 LAST IN FIRST OUT (LIFO)

This method is exactly opposite of FIFO method. It is based on the assumption that the material purchased and received last in store are issued first to the job. Under this method the cost of last lot of materials purchased is used for pricing the material issues. Thereafter the price of next earlier lot is taken and so on. In other words, the materials are issued at the latest cost price. The closing stock of materials are valued at the oldest cost price.

In case of a rising price LIFO method is suitable because material is issued at current price.

Advantages:

i. It is simple to operate and easy to understand.
ii. It is appropriate for matching cost and revenue.
iii. Closing stock will be valued at earlier price and will not, therefore show unrealised profit.
iv. It shows real income in times of rising prices.
v. It is good method of avoiding tax.

Disadvantages:

i. Calculations become complicated when rates of receipts are highly fluctuating.
ii. Closing stock are not valued at current market price. It is valued at unreal and outdated cost.
iii. The stocks require to be adjusted during falling prices.
iv. Due to variation of prices, comparison of cost of similar job is not possible.
v. This method is not useful in case of perishable materials.

6.4 SIMPLE AVERAGE METHOD

Under this method materials are issued at the average price of materials on hand on the date of issue. The simple average price is calculated dividing the total of all rates of material in hand by the number of rates. The lot which is exhausted, based on FIFO method is excluded in computing the average.

Rate of Issue = $\frac{TOTAL\ OF\ DIFFERENT\ RATES}{NUMBER\ OF\ RATES}$

This method is useful when the materials are received in uniform quantities and purchase prices are normally stable.

Advantages:

i. This method is easy to operate.

ii. It gives reasonably accurate results if prices are stable.

Disadvantages:

Materials are not priced at actual costs.

i. It does not take into account the quantity of materials purchased.

ii. Verification of closing stock becomes difficult.

iii. When price and quantity of different lots are widely fluctuates, this method gives incorrect result.

6.5 WEIGHTED AVEARGE METHOD

This method gives due importance to quantity of material in stock. Under this method issue price of material is calculated by dividing the value of materials in stock by the quantities of material in stock

Rate of Issue = $\frac{VALUE\ OF\ MATERIAL\ IN\ STOCK}{QUANTITIES\ OF\ MATERIALS\ IN\ STOCK}$

Weighted average rate is calculated each time when a fresh lot is received. It remains the same till the next lot is received. Thus issue price are calculated at the time of receipt of material and not all the times of issue of material.

This method is useful, where the purchase price and quantities of material are widely different.

Advantages:

i. Easy to calculate and operate.

ii. Closing stock value is acceptable.

iii. When prices fluctuate considerably, it smooth out the fluctuations.

iv. This method is more logical than the simple average method.

Disadvantages:

i. The issues are not priced at current market price.

ii. Issue price of materials does not represent actual cost price and therefore a profit or loss may arise.

iii. It involves considerable amount of clerical work.

6.6 ILLUSTRATIONS

Illustration 01: The following is a summary of the receipts and issues of materials in a factory during the month of April.

Prepare a statement showing the pricing of issues on the basis of -

a) FIFO method

b) LIFO method

c) Simple Average method

d) Weighted Average method

Date	Particulars	Qty.	Rate per unit Rs.
1	Received	2000	10
5	Received	300	12
8	Issued	1200	-
10	Received	200	14
12	Issued	1000	-
23	Received	300	11
31	Issued	200	-

Solution 01:

a) STORES LEDGER ACCOUNT (FIFO)

Date	Receipts				Issues				Balance			Remark
April	Ref.	Qty.	Rate Rs.	Amt. Rs.	Ref.	Qty.	Rate Rs.	Amt. Rs.	Qty.	Rate Rs.	Amt. Rs.	
1		2000	10	20,000					2000	10	20,000	
5		300	12	3600					2000	10	20,000	
									300	12	3600	

8						1200	10	12000	800	10	8000	
									300	12	3600	
10		200	14	2800					800	10	8000	
									300	12	3600	
									200	14	2800	
12						800	10	8000	100	12	1200	
						200	12	2400	200	14	2800	
23		300	11	3300					100	12	1200	
									200	14	2800	
									300	11	3300	
31						100	12	1200	100	14	1400	
						100	14	1400	300	11	3300	

b) STORES LEDGER ACCOUNT (LIFO)

Date	Receipts				Issues				Balance			Remark
April	Ref.	Qty.	Rate Rs.	Amt. Rs.	Ref.	Qty.	Rate Rs.	Amt. Rs.	Qty.	Rate Rs.	Amt. Rs.	
1		2000	10	20,000					2000	10	20,000	
5		300	12	3600					2000	10	20,000	
									300	12	3600	
8						300	12	3600				
						900	10	9000	1100	10	11000	
10		200	14	2800					1100	10	11000	

									200	14	2800	
12						200	14	2800				
						800	10	8000	300	10	3000	
23		300	11	3300					300	10	3000	
									300	11	3300	
31						200	11	2200	300	10	3000	
									100	11	1100	

c) STORES LEDGER ACCOUNT (Simple Average)

Date	Receipts				Issues				Balance			Remark
April	Ref.	Qty.	Rate Rs.	Amt. Rs.	Ref.	Qty.	Rate Rs.	Amt. Rs.	Qty.	Rate Rs.	Amt. Rs.	
1		2000	10	20,000					2000	10	20,000	
5		300	12	3600					2300		23,600	
8						1200	$\frac{10+12}{2}=11$	13200	1100		10400	
10		200	14	2800					1300		13200	
12						1000	$\frac{10+12+14}{3}=12$	12000	300		1200	
23		300	11	3300					600		4500	
31						200	$\frac{12+14+11}{3}=12.33$	2467	400		2033	

d) STORES LEDGER ACCOUNT (Weighted Average)

Date	Receipts				Issues				Balance			Remark
April	Ref.	Qty.	Rate Rs.	Amt. Rs.	Ref.	Qty.	Rate Rs.	Amt. Rs.	Qty.	Rate Rs.	Amt. Rs.	
1		2000	10	20,000					2000	10	20,000	
5		300	12	3600					2300	10.26	23600	
8						1200	10.26	12312	1100		11288	

10		200	14	2800					1300	10.84	14088	
12						1000	10.84	10840	300		3248	
23		300	11	3300					600	10.91	6548	
31						200	10.91	2182	400		4366	

Illustration 02: The following transactions took place in respect of material x during the month of January 2010

1 - Opening stock 50 tons at Rs. 1000 per ton 2 - Issued 30 tons

6 - Received 60 tons at Rs. 1100 per ton

9 - Issued 25 tons (Stock verification reveals loss of one ton)

10 - Received back from orders 10 tons (previously issued at Rs. 990 per ton)

11 - Issued 40 tons

22 - Received 22 tons at Rs. 1200 per ton 31 - Issued 33 tons.

You are required to write up the stores ledger Account under the - a) FIFO Method

b) LIFO Method

Solution 02:

a) STORES LEDGER ACCOUNT (FIFO)

Date	Receipts				Issues				Balance			Remark
Jan 2010	Ref.	Qty. ton	Rate Rs.	Amt. Rs.	Ref.	Qty. ton	Rate Rs.	Amt. Rs.	Qty. ton	Rate Rs.	Amt. Rs.	
1	Bal.								50	1000	50,000	
2						30	1000	30000	20	1000	20000	
6		60	1100	66000					20	1000	20000	
									60	1100	66000	
9						20	1000	20000				
						5	1100	5500				
					Loss	1	1100	1100	54	1100	59400	
10	Back	10	990	9900					54	1100	59400	
									10	990	9900	
11						40	1100	44000	14	1100	15400	

									10	990	9900	
22		22	1200	26400					14	1100	15400	
									10	990	9900	
									22	1200	26400	
31						14	1100	15400				
						10	990	9900				
						9	1200	10800	13	1200	15600	

b) STORES LEDGER ACCOUNT (LIFO)

Date Jan 2010	Receipts				Issues				Balance			Remark
April	Ref.	Qty.	Rate Rs.	Amt. Rs.	Ref.	Qty.	Rate Rs.	Amt. Rs.	Qty.	Rate Rs.	Amt. Rs.	
1	Bal.								50	1000	50,000	
2						30	1000	30000	20	1000	20000	
6		60	1100	66000					20	1000	20000	
									60	1100	66000	
9						25	1100	27500	20	1000	20000	
					Loss	1	1100	1100	34	1100	37400	
10	Back	10	990	9900					20	1000	20000	
									10	990	9900	
11						10	990	9900	20	1000	20000	
						30	1100	33000	4	1100	4400	
22		22	1200	26400					20	1000	20000	
									4	1100	4400	
									22	1200	26400	
31						22	1200	26400				
						4	1100	4400				
						7	1000	7000	13	1000	13000	

Illustration 03: Prepare a statement showing the pricing of issues on the basis of (a) simple Average and (b) Weighted Average Methods from the following information during a month.

Date -

1 - Purchased 100 units @ Rs. 10.00 each

2 - Purchased 200 units @ Rs. 10.20 each

5 - Issued 250 units to joab A vide MR. No. 1

7 - Purchased 300 units @ Rs. 10.50 each

10 - Purchased 200 units @ Rs. 10.80 each

13 - Issued 200 units to job B vide MR No. 2

18 - Issued 200 units to job c vide MR No. 3

20 - Purchased 100 units @ Rs. 11.00 each

25 - Issued 150 units to job D vide MR No. 4

Solution 03:

a) STORES LEDGER ACCOUNT (Simple Average Method)

Date	Receipts				Issues				Balance			Remark
April	Ref.	Qty.	Rate Rs.	Amt. Rs.	Ref.	Qty.	Rate Rs.	Amt. Rs.	Qty.	Rate Rs.	Amt. Rs.	
1		100	10.00	1000					100		1000	
2		200	10.20	2040					300		3040	
5					MR No.1	250	10.10	2525	50		515	
7		300	10.50	3150					350		3665	
10		200	10.80	2160					550		5825	
13					MR No.2	200	10.50	2100	350		3725	
18					MR No.3	200	10.65	2130	150		1595	
20		100	11.00	1100					250		2695	
25					MR No.4	150	10.90	1635	100		1060	

Notes - Issue Rates

1) MR No. 1 - $\frac{10.00 + 10.20}{2} = 10.10$

2) MR No. 2 - $\frac{10.20 + 10.50 + 10.80}{3} = 10.50$

3) MR No. 3 - $\frac{10.50 + 10.80}{2} = 10.65$

4) MR No. 4 - $\frac{10.80 + 11.00}{2} = 10.90$

While calculating simple Average price we have to be taken into consideration only those prices of goods which are in the stock.

b) STORES LEDGER ACCOUNT (Weighted Average Method)

Date	Receipts				Issues				Balance			Remark
April	Ref.	Qty.	Rate Rs.	Amt. Rs.	Ref.	Qty.	Rate Rs.	Amt. Rs.	Qty.	Rate Rs.	Amt. Rs.	
1		100	10.00	1000					100	10.00	1000	
2		200	10.20	2040					300	10.13	3040	
5					MR No.1	250	10.13	2533	50	10.13	507	
7		300	10.50	3150					350	10.45	3657	
10		200	10.80	2160					550	10.58	5817	
13					MR No.2	200	10.58	2116	350	10.58	3701	
18					MR No.3	200	10.58	2116	150	10.58	1585	
20		100	11.00	1100					250	10.74	2685	
25					MR No.4	150	10.74	1611	100	10.74	1074	

Notes - Issue Rates

1) MR No. 1 - $\frac{3040}{300} = 10.13$

2) MR No. 2 - $\frac{5817}{550} = 10.58$

3) MR No. 3 - $\frac{3701}{350} = 10.58$

4) MR No. 4 - $\frac{2685}{250} = 10.74$

Illustration 04: During Jan 2011, the Parag Engineering co. ltd. effected the purchase of a certain items of stores as under –

Date -	**Units**	**Total Amount Rs.**

2-1-2011	100	**190**
15-1-2011	**150**	**333**

During the same period the details of the issues of the item were as under -

Date - Units

8-1-2011 40

20-1-2011 100

Besides on 1-1-2011 there was an opening balance of 160 units valued for Rs.200.

Enter the above transactions in the stores Ledger under the following methods of pricing issues

a) Weighted Average

b) Last - in - First - out.

Solution 04:

a) STORES LEDGER ACCOUNT (Weighted Average method)

Date	Receipts				Issues				Balance			Remark
April	Ref.	Qty.	Rate Rs.	Amt. Rs.	Ref.	Qty.	Rate Rs.	Amt. Rs.	Qty.	Rate Rs.	Amt. Rs.	
1	Bal								160	1.25	200	
2		100	1.90	190					260	1.50	390	
8						50	1.50	75	210	1.50	315	
15		150	2.22	333					360	1.80	648	
20						100	1.80	180	260	1.80	468	

Notes - Issue Rates are calculated as under -

1) On 8th Jan. - $\frac{390}{260}$ = 1.50 2) On 20th Jan. - $\frac{648}{360}$ = 1.80

b) STORES LEDGER ACCOUNT (LIFO method)

Date Jan 2011	Receipts				Issues				Balance			Remark
April	Ref.	Qty.	Rate Rs.	Amt. Rs.	Ref.	Qty.	Rate Rs.	Amt. Rs.	Qty.	Rate Rs.	Amt. Rs.	
1	Bal.								160	1.25	200	
2		100	1.90	190					160	1.25	200	
									100	1.90	190	
8						50	1.90	95	160	1.25	200	
									50	1.90	95	

15		150	2.22	333					160	1.25	200	
									50	1.90	95	
									150	2.22	333	
20						100	2.22	222	160	1.25	200	
									50	1.90	95	
									50	2.22	111	

6.7 LET US SUM UP

- Power to remove a director has always been bestowed on shareholders.
- Directors are retired by rotation regularly at every annual general meeting of the company.

6.8 REVIEW QUESTIONS

Q 1: Prepare a store ledger Account showing the receipts and the issues of Material X for March 2010 pricing the material issued on the basis of a) FIFO method and b) LIFO method

Receipts:-

Date -	**Quantity**	**Rate per unit Rs.**
1-3-2010	2000 units	**20**
18-3-2010	3000 units	**18**
30-3-2010	1000 units	**16**
Issues :-		
Date -	Quantity	
4-3-2010	1000 unis	
10-3-2010	500 units	
22-3-2010	2500 units	
31-3-2010	**1000 units**	

Q 2: From the following transactions, prepare separately the stores Ledger Accounts, using the- a) FIFO method and b) LIFO method

Jan. 1 - Opening balance 100 units @ Rs. 5 each Jan. 5 - Received 500 units @ Rs. 6 each

Jan. 20 - Issued 300 units

Feb. 5 - Issued 200 units

Feb. 6 - Received 600 units @ Rs. 5 each

Mar. 10 - Issued 300 units

Mar. 20 - Issued 250 units.

Q 3: The following is a summary of the receipts and issues of materials in a factory during a month.

Date -

1 - Opening balance 500 units at Rs. 25 per unit

2 - Issued 70 units

4 - Issued 100 units

8 - Issued 80 units

13 - Received 200 units at Rs. 24.50 per unit

14 - Returned to store 15 units at Rs. 24 per unit

16 - Issued 180 units

20 - Received 240 units at Rs. 24.75 per unit

24 - Issued 304 units

25 - Received 320 units at Rs. 24.50 per unit

26 - Issued 112 units

27 - Returned to store 12 units at Rs. 24.50 per unit

28 - Received 100 units at Rs. 25 per unit.

Work out on the basis of FIFO method. It was revealed that on 15th there was a shortage of 5 units and on 27th of 8 units.

Q 4: The following transactions took place in respect of material item during the month

of April.

Date	Receipt Qty.	Rate	Issue Qty.
2	2000	2.00	
10	3000	2.40	
15			**2500**
18	2500	2.60	
20			**2000**

Prepare the stores Ledger Account, pricing the issue at the a) simple Average Rate and b) Weighted Average Rate.

UNIT-7: TREATMENT OF MATERIAL LOSSES

LEARNING OBJECTIVES

After studying this unit, you will be able to:

- explain the meaning of independent director
- discuss the provisions related to code of conduct of independent director
- know about women director
- Know Small Shareholders' Director and alternate director.

STRUCTURE

7.1 ACCOUNTING FOR MATERIAL LOSSES

Losses of materials may arise during handling, storage or during process of manufacture. Such losses may be classified into two categories, i.e. normal loss and abnormal loss. Normal loss is that loss which has necessarily incurred and thus is unavoidable. Examples:

- Loss by evaporation
- Loss due to loading and unloading
- Loss due to breaking the bulk, etc.

Normal losses of material cannot be completely avoided but may be controlled to a limited extent.

Abnormal loss is that loss which arises due to inefficiency in operations, mischief, carelessness, etc. Examples –

- Theft or pilferage
- Breakage
- Fire, accident, flood, etc.
- Use of inaccurate instruments
- Improper storage, etc.

Accounting Treatment

As a principle, all normal losses which are necessarily incurred are treated as a part of the cost and abnormal losses should not be included in the cost. In order to absorb normal material losses in cost, the rates of usable units are inflated so that such losses are absorbed. Alternatively, normal material loss is transferred to factory overhead. However abnormal loss of material are charged to Costing Profit and Loss account.

Materials losses may arise in the form of waste, scrap, spoilage or defectives.

7.2 WASTE

Waste comprises of invisible loss, visible loss that cannot be collected and also the unsaleable portion of the collected loss. Waste is excluded from output quantity. Examples of waste are smoke, dust, gases, slag, etc.

In certain cases, the waste involves further costs of disposing it, e.g., cost incurred for disposal of effluent, obnoxious gases etc.

Accounting Treatment

Standards are established for waste. Actual wastage is recorded and variation from standards are reported.

i. Normal Waste: This is unavoidable and uncontrollable and treated as part of the product cost. The wastage cost is borne by the good units.

ii. Abnormal Waste: It is valued as if the output is good. This cost is transferred to the Costing Profit and Loss Account.

Sometimes a demand may arise for the waste, e.g., it may be used as a substitute raw material. The selling price has to be suitably fixed on the basis of the market value of the raw material substituted.

7.3 SCRAP

Scrap represents the unusable loss which can be sold. It is a residue which is measurable and has a minor value. It may result from the processing of materials, obsolete stock or defective parts. The sale value is credited to the concerned department which produced it. If the value is negligible, it is credited to the Costing Profit and Loss Account.

Scrap may arise in the form of turnings, boring's, filings etc. from metal; sawdust in timber industry, off-cuts and cut pieces in leather industry.

A committee may be constituted which classifies the various types of scrap, calculates their value and quantity and also determine the method of use/disposal.

Accounting Treatment

i. Where the scrap has negligible value, it is charged to good units. Income is credited to other income.

ii. The sale value can be reduced from the material cost.

iii. If the scrap has very little value, only a quantity record need be kept.

iv. The cost is calculated by reducing the sale price by the selling cost and this sum is taken as a credit to the production overhead account.

v. Scrap arising in one job may be used in another. Such transfers should be properly recorded on material transfer notes.

The actual quantity of scrap is compared with the standard quantity. Excess scrap is investigated so that corrective action can be taken. At the designing stage, such a type, form and shape of material are chosen which will minimise the waste/scrap. Best equipment should be used and personnel should be properly trained.

7.4 SPOILAGE

Spoilage are those materials or components which are so damaged in the manufacturing process that they cannot be repaired or reconditioned. Some spoilage may be sold as seconds. If they are badly spoiled they can be sold as waste or scrap. Spoiled units do not attain the quality required and it is not economic to correct them.

Spoilage occurs due to some defect in operations or materials. Sometimes the entire production in a batch may have to be rejected or a part of it may be rejected.

Accounting Treatment

i. Loss due to spoilage can be debited to the job/product/process in which it occurred.

ii. It may be charged to factory overheads so that the loss is borne by all products.

iii. Abnormal loss which is unexpected but controllable should be transferred to the Costing Profit and Loss Account.

If spoilage occurs on a specific job/special order, it is charged to that job itself. Sometimes loss is prorated on the basis of percentage of scrap anticipated from each job.

The method of apportionment of spoilage between normal and abnormal is explained below:

Total input 5,000 units

Normal spoilage 5% of input

Total spoiled unit 550 units

Total Cost `10,000

Sale value of spoilage `0.50 per unit

Standard output Input less 5% of Spoilage 4,750 units

Cost of abnormal spoilage = $\frac{10000-(250*0.5)*300}{4.750} = \frac{(10000-125)*300}{4.750} = 623.68$

Net cost of abnormal spoilage `623.68 – (300 x 0.50) = `473.68

The cost of abnormal spoilage is charged to Costing Profit and Loss Account and sale value is credited to Costing Profit and Loss Account.

The cost of normal spoilage is charged as product cost.

Units Cost of production = $\frac{10000-125-623.68}{5000-550} = 2.0789$

7.5 DEFECTIVES

Defectives are that portion of the process loss which can be converted into a finished product by incurring more material and labour expenses. The additional expenses are added to the cost of manufacture and the rectified units to total units. Imperfections may arise because of sub-standard materials, bad workmanship, inadequate inspection, lack of plans, etc. It should be ensured that the benefit resulting from rectification is more than the cost incurred on rectifications.

Rectification of defective units may be done by the department in which it was produced. In larger concerns a separate Department may be set up for this purpose.

Accounting Treatment

(i) Defectives inherent in the manufacturing process are classified as normal and treated in the following manner:

(a) The loss is charged to good products.

(b) The additional cost of rectification is charged to factory overheads and apportioned to various goods as part of the factory overhead.

(c) If a particular department is responsible for the additional cost of rectification, it can be charged to that department.

(ii) If the defective units can be traced to a specific job/order, the additional costs can be charged to that job/order.

(iii) If the defectives are abnormal and due to uncontrollable factors, the additional costs are charged to Costing Profit and Loss Account.

In many concerns, inefficient and bad workmanship results in defective units. To minimise defective work, suitable financial and non-financial incentives based on the quantity or percentage reduction in defective work should be provided.

7.6 CONTROL OF MATERIAL LOSSES

While designing a control system, controllable and uncontrollable losses should be distinguished. The system should determine standard levels which can be attained. Losses may be uncontrollable in the short- term but controllable over a period of time. Moreover, it takes time to control a new process. The various levels should be frequently reviewed. Losses can be minimised by proper storage, proper handling,

maintenance of suitable inventory levels etc.

A control system should calculate and report production and data regarding waste, scrap, spoilage and defectives should be regularly collected. Periodic reports help to evaluate performance and also in taking corrective action. Standards should be set. Variances of actuals from standards should be examined so that it can be effectively controlled.

The control of losses can be exercised at three levels:

(i) Occurrence

(ii) Recovery, handling and storage

(iii) Disposal.

7.6.1 CONTROL OVER OCCURENCE

Losses are incurred due to nature of the product, quality control, method of production etc. The causes may be summarized as follows:

(a) Labour-related causes: Lack of training errors committed by machine operator, inadequate supervision, damage caused by handling carelessness, fatigue etc.

(b) Causes related to manufacturing method: Defective equipments, pitfall in design, machine jams, trials and adjustments, overloading and excessive utilisation of resources, problems associated with new products, standards set etc.

(c) Materials related causes: Defective materials, obsolescence, evaporation, deterioration.

(d) Others: Strict inspection, thefts, etc.

7.6.2 CONTROL OVER RECOVERY HANDLING AND STORAGE

As soon as stores are received they should be handled and stored properly. Different types of losses should be identified at different stages of production. Items to be rectified should be identified. Good handling and proper storage protect goods from damage, theft and misappropriation.

7.6.3 CONTROL OVER DISPOSAL

To maximise the sales value of waste, scrap, spoilage etc. the following points are to be considered:

i. make the goods ready for sale
ii. select the best buyer
iii. control the quantities of losses

Bids may be obtained and prices obtained should be comparable with market prices. Physical control should be exercised over the quantities of scrap, spoilage leaving the factory and the quantities produced, repaired and sold must be continuously reviewed.

7.7 LET US SUM UP

- Losses of materials may be either normal loss or abnormal loss.
- Materials losses may arise in the form of waste, scrap, spoilage or defectives.

7.8 REVIEW QUESTIONS

Q 1: Define and explain the following terms and the treatment given in Cost Accounts:

a. Waste
b. Scrap
c. Spoilage
d. Defectives.

UNIT-8: TECHNIQUES OF MATERIAL CONTROL

LEARNING OBJECTIVES

After studying this unit, you will be able to:

- To understand the concept of Key Managerial Personnel
- To learn the process of appointment of Key Managerial Personnel in a company
- To get a complete understanding of provisions related to Managing Director
- To learn the concept of Whole time director and Manager

STRUCTURE

8.1 MEANING AND OBJECTIVES OF MATERIAL CONTROL

Material control is a function which can be termed as systematic control over purchasing, storing and using material in a manufacturing organisation. Thus, material control is the art and science of maintaining the material level of a given group of items, incurring the least total cost, consistent with other relevant targets and objectives set by the management.

The objective of material control is to maintain a regular supply of materials as and when they are needed and avoiding at the same time excessive holding of stock of materials.

This function is steered to ensure that right type of material is made available in right quantity at right time for production and other activities of the organisation. Since materials constitute a significant percentage of working capital, it must be regulated in the right direction so that costs can be minimised to maintain a reasonable rate of profit. To perform this function, it is essential that some material must be held in balance to be used without delay. The holding of such material as stock also involves blocking of funds and also other risks of loss or damage or obsolescence. Material Control aims to minimise this risk also

8.2 FUNCTIONS OF MATERIAL CONTROL

The following are the functions of material control-

a. Purchasing of Materials
b. Receiving and Inspection
c. Storing of Materials
d. Issue of Materials
e. Inventory Control
f. Inventory Records
g. Accounting of Materials.

- Decision to purchase is very crucial. Every material, stores, spares, components required by the various departments are required to be bought. The purchasing department considers the following before it proceeds to purchase.

a. Purchase Budget and
b. Indent or Requisition of materials from consuming or using department.

A purchase indent or requisition is the formal request to purchasing department to purchase certain type of material. It gives full information about:

i. Description of materials
ii. Quantity and
iii. Time when same will be required.

It is prepared by consuming department and sent to Stores Department and Purchase Department.

The Purchase Department then initiates steps to obtain material.

- Purchase organisation has additional responsibility of receiving and inspection of

materials purchased. This function tries to ensure whether material of right quality as required is actually received or not. Purchase function includes Receiving, Inspecting and Quality Control of materials received from suppliers. The Receiving officer shall inspect and verify the supply challan with the copy of Purchase Order. Normally when the materials are delivered by the supplier, the same is accompanied by a Delivery Challan. To ensure that the right type of material is received, materials are subject to inspection.

- Storing of Materials: This involves physical safety of material as well as maintaining stores record. After the material is received it is essential that it is stored safely so that the damage due to handling, temperature or theft or deterioration is minimised and at the same time it is made available as and when required for consumption. Storekeeping is a service function. Store-keeping is that aspect of material control, which is concerned, with the physical storage of goods. The storekeeper should consider peculiar quality or property of material and store it accordingly.
- Issue of Material: This function ensures that right type of material is made available and issued to consuming or production department.
- Inventory Control : With a view to maintain quality of material held as stock at such a level that same is neither too excessive nor too less than required and to minimise risk involved in holding stocks.
- Inventory Records: Keeping stock records of various types of materials by maintaining records of receipt and issue of materials and stock in terms of quantity and value.
- Accounting of Materials: Primarily above functions can be divided into three divisions:

i. Purchasing
ii. Storing, and
iii. Accounting

8.3 ALWAYS BETTER CONTROL (ABC)

This is also known as, ‘’Always Better Control Analysis’’ technique. It enables the management to decide the degree of control necessary and is based on ‘’management by exception’’ principle.

The technique is based on the study of the quantity and value of different types of

materials. In many cases it is found that out of various materials used by an organisation, there are items, which are used in low quantity but are of high value. At the same time there are materials which are used in large quantity but having low value. There for control purpose the materials are classified as under:

A. Items are low quantity with high value.
B. Items are medium quality and value.
C. Items are high quantity with small value.

The exact quantification of high / low classification depends on comparative value and differs from organisation to organisation and also from time to time.

The technique requires that:

'A' group items should be closely controlled at all stages of material handling. The procedure should be elaborate and subject to surprise verification.

'B' group items also need elaborate control but the extent and frequency may be less.

'C' group items in view of lower value are not subjected to detailed control procedures. The procedure may be made simpler.

Thus, time, attention and cost involved in material control is divided equitably on terms of value. In the times of changing prices, the analysis of materials in A, B, C groups should be reviewed periodically. The technique is aimed at obtaining maximum control over stock/ material and minimum cost of control.

8.4 VITAL ESSENTIAL DESIRABLE (VED) ANALYSIS

A-B-C Classification is on the basis of consumption value of an item and does not give any importance to the criticality of the item and therefore, only A-B-C Classification is not adequate. Classification done on the basis of criticality of the item is known as V-E-D, where the items are classified as Vital, Essential and Desirable. Vital items are those items which are very critical for the operations and do not permit any corrective time i.e. they cannot be procured off the shelf if they are not available. Essential items are comparatively less vital and work without them cannot be managed for few days. All remaining items are known as Desirable items.

8.5 HML/ FSN/ SDE ANALYSIS

HML ANALYSIS:

In this technique materials are classified on the basis of cost or value. Materials which are of the highest value are classified as 'H' Items, materials which are of the medium value are classified as 'M' Items and materials which are of the low value are classified as 'L' Items, and accordingly control over the materials is exercised.

FSN ANALYSIS:

In this technique materials are classified on the basis of movement or frequency of use. Materials which are frequently used are FAST moving items, Materials which are frequently used are FAST moving items, materials which are not used frequently are SLOW moving items, and materials which are rarely used are NON moving items, and accordingly control over the materials is exercised.

SDE ANALYSIS:

In this technique materials are classified on the basis of availability. Materials which are scarce are S category items moving items, Materials which are difficult to procure are D category items and Materials which are easily available are E category items and accordingly control over the materials is exercised.

8.6 STOCK LEVEL

This technique is applied to fix stock levels in terms of quantity to ensure proper control so as to ensure that optimum quantity of materials is bought and stored. It also answers question when to buy? And assists the management to budget and prepare time schedule of purchases. The technique requires fixation of stock level in respect of every type of material.

The different limits fixed are:

a. Maximum Level: This represents the minimum quantity above which stocks should not be held at any time.
b. Minimum Level: This represents the minimum quantity of stock that should be held at all times.
c. Danger Level: Normal issues of stock are usually stopped at this level and made only under specific instructions.

d. Ordering Level: It is the level at which indents should be placed for replenishing stocks.

e. Ordering Quantity: It is the quantity that is ordered.

Maximum Level:

It is normally a matter of policy. The various factors that should be taken into consideration are:

a. Capital Outlay: Investment to be made in stores, raw materials and other bulk items is an important consideration.

b. Available storage space for material.

c. Storage and insurance cost of material.

d. If certain goods are subject to obsolescence, the spare parts and components etc. of such products stocked should be limited.

e. Consumption of material periodically i.e. monthly, annually.

f. Lead time for delivery of material.

g. Certain goods are seasonal in nature and can be purchased only during specific period. Hence maximum level will be fixed for each season.

h. Price advantage arising out of bulk purchases should be availed.

i. The Economic Order Quantity also influences the maximum level.

Maximum stock level can be computed as follows:-

Maximum stock level = Re-order level + Re-ordering quantity – (Minimum consumption x Minimum re-order period).

Minimum Level

The minimum level is also a matter of policy and is based on:

a. Consumption of material periodically i.e. monthly, annually.

b. Lead time for delivery of material.

c. The production requirement.

d. The minimum quantity that could be advantageously purchased.

e. If an item is made to order then no minimum level is necessary.

The minimum stock level can be computed as follows:

Minimum level = Re-order level - (Normal consumption x Normal re-order period).

Danger or Safety Level

Material consumption varies from day to day, week to week and hence accurate forecasting is not possible. A safety or reserve stock is kept to avoid stock-out. The desirable safety stock level is that amount which minimises stock-out costs and also the carrying costs.

This level is a level of stock between the minimum level and nil stock. It is calculated for those items which can be utilised for multiple orders or products. The store-keeper usually does not issue once the danger level is reached. Usually priority is given to some order/product for the use of these items. This level is fixed up specially for control of production so that priority items can be produced.

This level is sometimes fixed above the minimum level. In this case, this level is preventive. If the level is below the minimum level, this level is corrective.

The safety stock level can be computed as follows:

Safety stock level = Ordering level – (Average rate of consumption * Re-order period)
OR
(Maximum rate of consumption - Average rate of consumption) * Lead time

Ordering Level

The annual consumption of an item and the time lag between ordering and receiving can be collected from past records. Based on these facts and policies, the ordering level and ordering quantity can be calculated, as follows:

Ordering level = Minimum level + Consumption during time lag period

OR

Maximum consumption x Maximum re-order period.

OR

Maximum consumption x Lead time + Safety Stock

The ordering level should be fixed so that when an indent is placed at the ordering level, the stock reaches the minimum level when the replenishment is received. The ordering level is calculated from the following factors:

(a) The expected usage

(b) The minimum level

(c) The lead time.

The order point is calculated keeping in mind the worst conditions so that minimum stock is always maintained.

Illustration 01:

Materials X and Y are used as follows:

Minimum usage - 50 units each per week

Maximum usage - 150 units each per week

Normal usage - 100 units each per week

Ordering quantities X = 600 units

Y = 1,000 units

Delivery period X = 4 - 6 weeks

Y = 2 - 4 weeks

Calculate for each material (i) Maximum level (ii) Minimum level and (iii) Ordering level.

Solution 01:

Material X

Ordering level = Maximum usage x Maximum delivery period

= 150 x 6

= 900 units.

Minimum level = Ordering level - (Normal usage x Normal delivery period)

= 900 - (100 x 5)

= 400 units

Maximum level = (Ordering level + Ordering quantity) - (Minimum usage x Minimum delivery period)

= 900 + 600 - (50 x 4)

= 1,500 - 200

= 1,300 units

Material Y

Ordering Level = Maximum usage x Maximum delivery period

= 150 x 4 = 600 units

Minimum Level = Ordering level - (Normal usage x Normal delivery period)

= 600 - (100 x 3) = 300 units.

Maximum Level = (Ordinary level + Ordering quantity) - (Minimum usage x Minimum delivery period)

= 600 + 1,000 - (50 x 2)

= 1,600 - 100 = 1,500 units.

Normal delivery period has been computed as follows:

Material X = $\frac{4+6}{2}$ = 5 weeks

Material Y = $\frac{2+4}{2}$ = 3 weeks

8.7 ECONOMIC ORDER QUANTITY

The basic problems of material control are two viz., what quantity of an item should be ordered at a time and when should an order be placed. While deciding economic ordering quantity, the efforts are directed to ascertain the ideal order size. While deciding the ideal order size, factors such as material carrying charges and the ordering cost associated with the placement of purchase orders are to be considered; the total of both has to be minimised. The material carrying charges include interest on the capital invested in the stores of materials, rent for the storage space, salaries and wages of the store-keeping department, any loss due to pilferage and deterioration, stores insurance charges, stationery, etc. used by the stores, taxes on inventories, etc. Ordering costs may include rent for the space used by the purchasing department, the salaries and wages of officers and staff in the purchasing department, the depreciation on the equipment and furniture used by the department, postage, telegraph charges and telephone bills, the stationery and other consumables required by the purchasing department, any travelling expenditure incurred, and the costs of inspection etc., on receipt of material.

The optimum ordering quantity, i.e., the quantity for which the cost of holding plus the cost of purchasing is the minimum is known as Economic ordering Quantity and is calculated by the following formula:

EOQ = $\sqrt{\frac{2AO}{I}}$

Where, E.O.Q. = Economic Ordering Quantity

A = Annual consumption (units) during the year

O = Cost of placing an order

I = Annual cost of storage of one unit.

While deciding the question as to what should be the economic ordering quantity one has to ensure that the cost incurred should be minimum. An ideal order size, therefore, is at the quantity where the cost is minimum i.e., cost of holding the stock and ordering cost intersect each other. This is graphically shown hereunder:

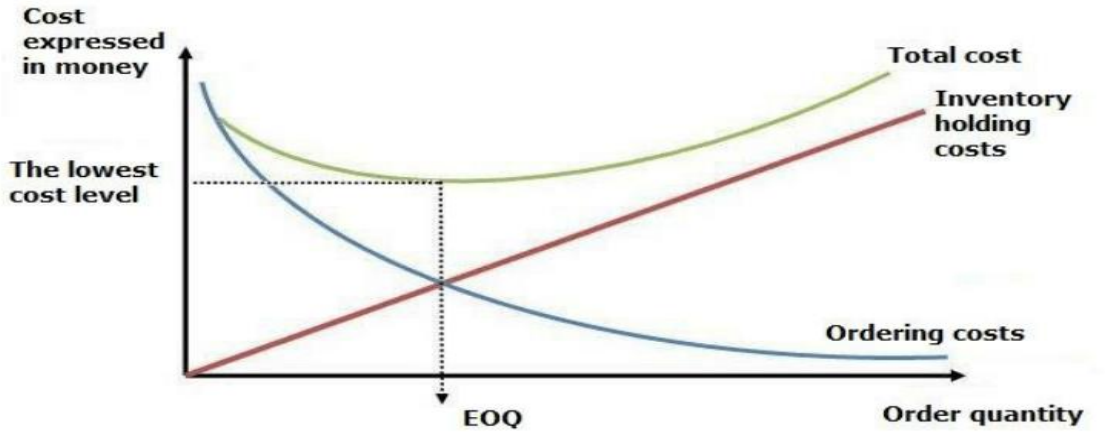


Illustration 02:

Ace Ltd. manufactures a product and the following particulars are collected for the year ended March, 2013:

Monthly demand (units)	250
Cost of placing an order (`)	100
Annual carrying cost (` per unit)	15
Normal usage (units per week)	50
Minimum usage (units per week)	25
Maximum usage (units per week)	75
Re-order period (weeks)	4–6

You are required to calculate:

(i) Economic order quantity

(ii) Re-order level

(iii) Minimum level

(iv) Maximum level

(v) Average stock level.

Solution 02:

(i) Economic order Quantity = $\sqrt{\frac{2AO}{I}} = \sqrt{\frac{2*2600*100}{15}}$ = 186 Units

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

(ii) Re-order level = Maximum Re-order period or Maximum delivery period x Maximum usage = 6 weeks x 75 = 450 units.

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

= 450 units – (50 units x 5 weeks) = 200 units.

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

= (450 units + 186 units) – (25 units x 4 weeks) = 536 units.

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

$= \frac{536+200}{2}$ = 368 Units

Or, Average stock level = Minimum level + 1/2 Reorder quantity

= 200 units + 1/2 x 186 = 293 units.

Illustration 03:

A factory requires 1,500 units of an item per month. The cost of each unit is `27. The cost per order is `150 and material carrying charge works out to 20% of the average material. Find out the economic order quantity (EOQ) and ascertain the number of orders to be placed per year. Would you accept a 2% price discount on a minimum supply of 1,200 units?

Solution 03:

When No Discount is Available

Annual requirement 1500 units × 12 = 18,000 units

EOQ $\sqrt{\frac{2*18000*150}{20\%\ of\ 27}}$ $\sqrt{\frac{5400000}{5.4}}$ units

No. of orders per year = 18000 ÷ 1000 = 18 orders

If discount is given (original price – 2% discount)

Cost price = `27 – 0.54 = ` 26.46

When 2% Price Discount is Available

No of orders to be placed: 18000 ÷ 1200 = 15 orders

Material carrying cost: 20% of ` 26.46 = `5.292

Total cost without discount = ordering cost + carrying cost + purchase price

= 18 x 150 + ½ x 1000 x 5.40 + 18000 x 27

= 2700 + 2700 + 4,86,000

= `4,91,400

Total cost with 2% discount = 15 x 150 + ½ x 1200 x 5.292 + 18000 x 26.46

= 2250 + 3175.20 + 4,76,280

= `4,81,705.20

Since the total cost is less with 2% discount, the proposal may be accepted.

8.8 PERPETUAL INVENTORY SYSTEM

The perpetual inventory system is intended as an aid to material control. It is a system of stock control followed by stores department. The system follows a method of recording stores by which information about each receipt, issue and current balance of stock is always available.

The Institute of Cost and Management Accountants of England and Wales, defines perpetual inventory as "A system of records maintained by the controlling department, which reflects the physical movement of stocks and their current balances."

According to Weldon, "Perpetual inventory system is a method of recordings stores balances after every receipt and issue, to facilitate regular checking and obviate closing down of work for stock-taking."

Thus, it is a system of ascertaining current balance after recording every receipt and issue of materials through stock records. An important point which should be kept in mind is that the perpetual inventory is usually checked by a programme of continuous stock-taking. Perpetual inventory means the system of it cords whereas continuous stock-taking means the physical checking of those records with actual stocks. '

Perpetual inventory system comprises of:

(a) Comparison of Bin Cards (quantitative perpetual inventory) and Stores Ledger Accounts (quantitative-cum-valued perpetual inventory),

(b) Continuous Stock-Taking (Physical perpetual inventory)

- **Comparison of Bind Cards and Stores Ledger Account**

  Bin card is maintained by the store-keeper and stores ledger account is maintained by stores accountant. Each item of stores is recorded at these places simultaneously. Normally the balances shown by the two records tally. However, there may arise some differences between these two records due to the following reasons:

  (i) Omission of an item of store in bin card or stores ledger account.

  (ii) Wrong posting of an item of store either in bin card or in stores ledger account.

  (iii) Arithmetical error in working out their balances. Therefore, the balances of the two records should be reconciled at frequent intervals and correct balances should be drawn.

- **Physical Stock Verification**

  The perpetual inventory system is not complete without a systematic procedure for physical verification of stores. The correctness of balances as shown in the bin card or stores ledger account should be verified by means of physical stock verification.

  Physical stock verification may be conducted in the following two ways:

  (i) Periodic stock verification: It refers to a system where physical stock verification is normally done periodically, i.e., once or twice in a year. Under this method, value of stock is determined by physical counting of the stock on a particular date, usually at the end of the year.

  (ii) Continuous stock verification: This system comprises of counting and verifying i number of items at random daily throughout the year so that all items of stores are verified several times during the year. Notice of the particular stock to be verified each clay is given to the store-keeper only on the date of actual verification.

  Advantages of Perpetual Inventory System

  (i) Easy detection of errors - Errors and frauds can be easily detected at an early date. It helps in preventing their occurrence.

  (ii) Better control over stores- The system exercises better control over all receipts and issues in such a manner so as to give a complete picture of both quantities and values of stock in hand at all times.

  (iii) No interruption of production process- Production process is not interrupted as the physical verification of stock is made on a planned and regular basis.

  (iv) Acts as internal check- Under the system, records are made simultaneously in the

bin cards and stores ledger accounts which acts as a system of internal check for detection of errors as and when they are committed.

(v) Investment in materials kept under control - The investment in materials is kept at a minimum level as the actual stock is continuously compared with the maximum level and minimum level.

(vi) Early detection of loss of stock- Loss of stock due to shrinkage, evaporation, accident, fire, theft, etc. can be easily detected.

(vii) Accurate and up-to-date accounting records- Due to continuous stocktaking, the store-keeper and stores accountant become more vigilant in their works and they maintain accurate and up-to-date records.

(viii) Easy to prepare interim accounts- It is possible to prepare periodical profit and loss account and balance sheet without physical stock-taking being made.

Availability of correct stock data- Correct stock data is readily available for settlement of insurance claims.

Disadvantages of excessive Stock are avoided - The following disadvantages of excessive stock are avoided:

(a) Loss of interest on capital locked up in stock.

(b) Loss through deterioration.

(c) Risk of obsolescence.

(xi) Employment of specialised staff - Since the work is spread throughout year, whole time specialised staff can be engaged for the purpose.

(xii) Moral check on employees - The system acts as a moral check on the employees working in the stores which increases their efficiency.

Such losses increase the cost of production. These losses may be in the form of wastage scrap, defective and spoilage. The problems of waste, scrap, spoilage or defectives materials must arise in almost all manufacturing industries. There is no uniformity the meaning and accounting treatment of waste, scrap, spoilage and defective However, steps should be taken to minimise the discrepancy so that efficiency can increased and proper material control is ensured.

8.9 JUST IN TIME (JIT)

The just-in-time (JIT) inventory system is a management strategy that aligns raw-

material orders from suppliers directly with production schedules. Companies employ this inventory strategy to increase efficiency and decrease waste by receiving goods only as they need them for the production process, which reduces inventory costs. This method requires producers to forecast demand accurately.

A just-in-time inventory system keeps inventory levels low by only producing for specific customer orders. The result is a large reduction in the inventory investment and scrap costs, though a high level of coordination is required. This approach differs from the more common alternative of producing to a forecast of what customer orders might be. By using just-in-time concepts, there is a greatly reduced need for raw materials and work-in-process, while finished goods inventories should be close to non-existent.

Advantages of Just-in-Time

- There should be minimal amounts of inventory obsolescence, since the high rate of inventory turnover keeps any items from remaining in stock and becoming obsolete.
- Since production runs are very short, it is easier to halt production of one product type and switch to a different product to meet changes in customer demand.
- The very low inventory levels mean that inventory holding costs (such as warehouse space) are minimized.
- The company is investing far less cash in its inventory, since less inventory is needed.
- Less inventory can be damaged within the company, since it is not held long enough for storage-related accidents to arise. Also, having less inventory gives materials handlers more room to maneuver, so they are less likely to run into any stored inventory and cause damage.
- Production mistakes can be spotted more quickly and corrected, which results in fewer products being produced that contain defects.

Disadvantages of Just-in-Time

- A supplier that does not deliver goods to the company exactly on time and in the correct amounts could seriously impact the production process.
- A natural disaster could interfere with the flow of goods to the company from suppliers, which could halt production almost at once.
- An investment should be made in information technology to link the computer systems of the company and its suppliers, so that they can coordinate the delivery of parts and

materials.

- A company may not be able to immediately meet the requirements of a massive and unexpected order, since it has few or no stocks of finished goods.

8.10 LET US SUM UP

• Perpetual Inventory System is a system of ascertaining balance after every receipt and issue of materials through stock records to facilitate regular checking and to avoid closing down the firm for stock taking

• Just in time (JIT) is an inventory management strategy that strives to improve a business return on investment by reducing in-process inventory and associated carrying costs.

• Just-in-Time inventory system focuses on "the right material, at the right time, at the right place, and in the exact amount" without the safety net of inventory.

8.11 REVIEW QUESTIONS

Q 1: Explain what is 'minimum level', 'maximum level', 'ordering level', quantity. How are they determined?

Q 2: Explain ABC analysis. What are its merits?

Q 3: Perpetual inventory is a method of maintaining records, whereas continuous stock taking involves physical checking of those records with actual stock. Comment.

Q 4: From the following records regarding material calculate (i) the re-order level, (ii) the maximum stock level, and (iii) the minimum stock level.

Re-order quantity	6,000 units
Minimum stock (for emergencies)	5 weeks
Average delivery time	4 weeks
Maximum stock level	20 weeks
Average consumption per week	400 units
Minimum consumption in 4 weeks	1,200 units

Q 4: Two components X and Y are used as follows:

Normal usage	50 units each per week
Minimum usage	25 units each per week
Maximum usage	75 units each per week
Re-order quantity	X: 400 units; Y: 600 units
Re-order period	X: 4 to 6 weeks; Y: 2 to 4 weeks.

Calculate for each components: (1) the re-order level, (2) the minimum level, (3) the maximum level, and (4) the average stock level.

Block-3

ACCOUNTING FOR LABOUR AND OVERHEADS

Unit-9: Accounting for Labour Cost

Unit-10: Classification and Distribution of Overheads

Unit-11: Absorption of Factory Overheads

Unit-12: Treatment of other Overheads

UNIT-9: ACCOUNTING FOR LABOUR COST

LEARNING OBJECTIVES

After studying this unit, you will be able to:

- explain the meaning of labour cost
- explain the meaning of idle time
- discuss the concept of over time
- discuss the different methods of wage payment.
- explain the meaning of remuneration and incentives
- explain the features of a good wage system
- explain the various methods of labour remuneration and incentives
- discuss the requisites of a good incentive plan.

STRUCTURE

9.1 INTRODUCTION

In this unit we will be discuss the concept of labour cost. You know that in any organization, labour plays an important role. Without labour the production of an industry is not possible. In some skill based industry, the proportion of labour cost may vary from 35% to 50%. So it is regarded as one of the important segments of study in costing. In this unit we will specifically focus on labour turnover, idle time, over time and on the methods of wage payment.

The concept of labour remuneration and incentives. You know that in any organization, labour plays an important role. The labour force need to compensate adequately to motivate them to work efficiently. The remuneration and incentives paid to the labour force of an organisation constitute a major component of total cost of an organisation. So it is regarded as one of the important segments of study in costing. In this unit we will specifically focus on labour remuneration and incentives.We shall also dicuss the various methods of wage payment.

9.2 MEANING OF LABOUR TURNOVER

Labour turnover signifies rate of change in the labour force. It indicates movement of workers into and out of the organisation due to accession or separation during a particular period of time. It is a parameter indicating the overall health of an industry or an establishment in terms of wages, industrial relations, working conditions and other welfare facilities provided by the employers to the workers. Higher rate of labour turnover indicates lack of stability in the labour force, which in turn may not be considered conducive to the productivity of labour. For higher productivity of labour, it is essential that labour force remains stable over a period of time.

Turnover is measured for individual companies and for their industry as a whole. If it is high relative to its competitors than it means the company have a shorter average tenure than those of other companies in the same industry. It is become costly, lowering productivity and morale and tends to get worse if not dealt with. Labour turnover does not just create costs, but some level of labour turnover is important to bring new ideas, skills and enthusiasm to the labour force. A natural level of labour turnover can be a way in which a business can slowly reduce its workforce without

having to resort to redundancies.

Causes:

The causes of leaving the job by workers may be —

- Poor morale and low level of motivation within the workforce
- Better prospects
- Change of Residence or other personal causes like marriage or pregnancy in case of women employees.
- Enrolling for national or emergency services.
- Lower Rate of Remuneration.
- Death, Retirement or Disability or workers which is unavoidable.

Effect:

- Labour turnover involves costs in a variety of ways —
- Cost of replacement or employing another person.
- Loss of trained and experienced personnel.
- Cost of training new person.
- Loss due to increase in wastage or lower efficiency of new employee.

9.3 MEANING OF IDLE TIME

Idle Time may be defined as the unproductive time for the employer even the labour is employed and paid. It is that time during which the workers spend their time without giving any production or benefit to the employer and concern. Generally idle time means that time for which the employer pays, but from which he obtains no production. Otherwise it is the difference between the times for which workers are paid but the workers do not work. So it is a loss to the organisation. It can be minimized but, cannot be controlled during idle time; the workers remain due and contribute nothing towards production. It is the difference between actual hour and actual hour worked. The idle time may arise due to non-availability of raw materials, shortage of power, machine breakdown etc.

There are two types of idle times:

1. Normal idle time and
2. Abnormal idle time

Normal idle Time: It refers that any loss of time is inherent in every situation which

cannot be avoided but effective effort should be made to reduce it. Any cost associated with the normal idle time is mostly fixed in nature. Normal idle time is permitted but abnormal idle time should be avoided.

Normal idle time wages is treated as a part of cost of production. Thus, in case of direct workers an allowance for normal idle time is built into labour cost rates. In the case of indirect workers, normal idle time wage is spread over all the products or jobs through the process of absorption of factory overheads.

The reasons may be:

1) The time taken by the worker while he walks between factory gate and place of work.
2) Time taken for lunch and tea break.
3) Time taken for obtaining work.
4) Time taken for changing from one job to another.
5) Waiting time for getting instructions, tools and or raw materials, spare parts etc.
6) It may be for personal affairs.

Abnormal idle time: It occurs due to some abnormal reasons. Abnormal idle time can be avoided if proper precautions are taken. Thus the factors which are responsible for controlling and avoiding idle time must be taken care of and planning has to make to reduce it. Abnormal idle time cost is not included as a part of production cost and is shown as a separate item in the Profit and Loss Account. So that normal cost is not distributed. The abnormal idle time may arise due to the following avoidable reasons:

1) Faulty planning.
2) Lack of co-operation and co-ordination.
3) Power failure.
4) Time lost due to delayed instructions.
5) Time lost due to inefficiency of workers.
6) Time lost due to non-availability of raw materials, spare parts, tools etc.
7) Time lost due to strikes, lock outs and lay-off.

9.4 CONCEPT OF OVERTIME

The term “Over time” refers the extra work done beyond the normal working hours or scheduled time by a worker. According to Factories Act, the wage rate of overtime work

has to be paid at double the normal rate of wages. The extra amount of remuneration is paid to the worker in addition to normal rate of wages is said to be overtime premium.

Effect Of Over Time Payment On Productivity: The following are the effects of over time payment on productivity:

1) Overtime premium is an extra payment over normal wages and hence will increase the production cost.

2) The efficiency of workers during overtime work may fall and hence output may be reduced.

3) To earn more, workers may not concentrate on work during normal hours and thus the output during normal hours may fall.

4) Reduced output and increased premium will increase the cost of production.

Accounting Treatment of Overtime Wages:

The following are the ways of charging of overtime premium:

1) If overtime is resorted to at the desire of the customer then overtime premium is charged to concerned job directly.

2) If overtime is required to cope with general production schedule or for meeting urgent orders, the overtime premium should be treated as overhead cost of particular department or cost centre which works overtime.

3) If overtime is worked on account of abnormal conditions such as flood, earthquake etc. that should be charged to costing profit and loss account.

Control of Overtime:

Control of overtime is essential to minimize the cost of production and increase the overall performance of the efficiency. Effective control of overtime can be possible through the following ways:

1) Effective sound planning of production

2) Adequate supervision.

3) Ensuring availability of raw materials, spare parts

4) Encouraging productivity

5) Reducing labour turnover

6) Ensuring effective system of repairs and maintenance, material handling and smooth flow of production

7) Fair and equitable remuneration to efficient and inefficient workers.

9.5 MEANING OF LABOUR REMUNERATION AND INCENTIVES

Remuneration is the reward for labour under normal circumstances and is generally based on either time spent or on the result produced. The former is called "time-related" remuneration and the latter is known as "Piece- related" remuneration. The fixation of method of remuneration in a proper manner is vitally important for any organisation because it deals with the most sensitive item of the input, i.e., Labour. To motivate the labour force to work more efficiently and effectively, the top level management often implements various performance related incentives for them. These incentives are found to be very effective not only in improving the performance of the labour force but also in retaining those resulting in reduced labour turnover. Incentive may be defined as "the stimulation of effort and effectiveness by offering monetary inducement or enhanced facilities". It may be monetary or non-monetary. Although incentive schemes increases the labour cost of an organisation, but a carefully designed incentive plan will serve as an investment for better productivity.

9.6 FEATURES OF GOOD WAGE SYSTEM

A carefully designed wages payment system will motivate the labour force to work efficiently and effectively. As such, development and implementation of a good wage system is very essential for any labour intensive organisation. The features of a good wage system are as follows:

(a) The system should be simple to understand and the various segments of the system, should clearly mention in detail.

(b) The employees should be able to accept the method without any doubts or hesitation in their mind.

(c) The method should be flexible enough to adopt any changes or variation which may become inevitable at a later stage.

(d) The method should be able to cut down/stabilize the labour turnover which is often causes due to unsatisfactory or unacceptable method of remuneration.

(e) The method should assure fair wages to the employees so that both the employers and the employees can gain by such methods, the former by way of higher productivity and the latter by way of higher earnings.

(f) Incentive payments should be a part of the method of remuneration with a view to increase the labour productivity.

(g) The method should be able to minimise the level of absentees so that avoidable wastages in labour cost can be reduced.

(h) The method should ultimately result into higher production and improved quality of the output.

9.7 METHODS OF WAGE PAYMENT

The workers should be well remunerated in an organisation. Such remuneration to the labour is generally termed as 'wages'. There are two basic methods of wages payment: (1) Time Wage System and (2) Piece Wage System.

A variety of bonus and premium plans have been designed to overcome the drawbacks of these two basic methods of wage payments. A system of incentive plans also takes into consideration. The primary principles of these two basic plans are known as Incentive or Bonus or Premium Plan. Thus, wage payment methods may be classified in the following four groups.

1) Time Rate Systems

2) Piece Rate Systems

3) Bonus System (or) Incentives Schemes

4) Indirect Monetary Incentives. These may be further classified as under:

1) Time Rate System:

a) At Ordinary Levels

b) At High Wage Levels

c) Guaranteed Time Rates.

2) Piece Rate System:

a) Straight Piece Rate

b) Piece Rates with Guaranteed Time Rate

c) Differential Piece Rates:

i) Taylor's Differential Piece Rate System

ii) Merrick Differential Piece Rate System

iii) Gantt Task and Bonus Plan.

3) Bonus System or Incentive Schemes:

a) Individual Incentive Plans:

i. Halsey Premium Plan
ii. Halsey-Weir Premium Plan
iii. Rowam Plan
iv. Barth Variable Sharing Plan
v. Emerson Efficiency Plan
vi. Bedaux Point Premium System
vii. Accelerating Premium Plan

b) Group Incentive Bonus Plans:

i. Budgeted Expenses bonus plan
ii. Priest Man bonus Plan
iii. Towne's Gain-sharing Plan
iv. Scanlon Plan

4) Indirect Monetary Incentives

a) Profit- Sharing
b) Co-partnership

5) Non-Monetary Incentives

9.8 TIME RATE SYSTEM

A) TIME RATE AT ORDINARY LEVELS: Under Time Wage System, wages are paid on the basis of time spent on the job irrespective of the quantity of work produced by the workers. In this case the amount of work done is not considered. This is also known as Time Rate or Day Wage System. The unit of time may be in a day, a week, a fortnight or a month. The formula for calculation of payment of time rate of ordinary levels is as follows:

Remuneration or Earnings = Hours Worked × Rate Per Hour

Time wage system is suitable under the following conditions:

• Where the units of output are difficult to measure, e.g. watchman.

• Where the quality of work is more important e.g., artistic furniture, fine jewellery, carving etc.

• Where machinery and materials used are very sophisticated and expensive.

• Where supervision is effective and close supervision is possible.

• Where the workers are new and learning the job.

• Where the work is of a highly varied nature and standard of performance cannot be established.

Advantage

• It is simple and easy to calculate.

• Earning of workers are regular and fixed.

• Time rate system is accepted by trade unions.

• Quality of the work is not affected.

• This method also avoids inefficient handling of materials and tools.

Disadvantages

• No distinction between efficient and inefficient worker is made and hence they get the same remuneration.

• Cost of supervision is high due to strict supervision used for high productivity of labour.

• labour cost in difficult to control due to more payment may be made for the lesser amount of work.

• No incentive is given to efficient workers. It will depress the efficient workers.

• There are no specific standards for evaluating the merit of different employees for promotions.

B) TIME RATE AT HIGH LEVELS: Under this system, efficient workers are paid higher wages in order to increase production. The main object of this method designed to remove the drawbacks of time rate at ordinary levels. This system is simple and easily understandable. When higher rate of wages are paid, it not only reduces labour turnover but also increases production and efficiency.

C) GUARANTEED TIME RATES: Under this method the wage rate is calculated by considering to changes in cost of living index. Accordingly, the wage rate is varied for each worker according to the change in cost of living index. This system is suitable during the period of raising prices.

9.9 PIECE RATE SYSTEM

In case of "Piece Rate System" or "Payment by Result", the payment of wages is

depending on the amount of work performed by the worker. Thus, a workman is paid in direct proportion to his output under this system.

Advantages:

- It facilitates direct relation between efforts and reward.
- This system encourages the efficient workers to increase production.
- Under this system efficient workers are recognized and rewarded.
- It helps to reduce the cost of supervision and idle time.
- Tenders or quotations can be prepared confidently and accurately.

Disadvantage:

- Where a concern is producing large quantities, it is difficult to fix a piece rate.
- In order to maximize their earnings, workers working with high speed may affect their health.
- The quality of output cannot be maintained.
- This system is not encouraging to the inefficient workers.
- Temporary delays or difficulties may affect the earnings of the workers.

Piece Rate System is suitable where

- Quality and workmanship are not important.
- Work can be measured accurately.
- Quantity of output directly depends upon the efforts of the worker.
- Production of standardized goods in a factory.
- Job is of a repetitive nature.

There are three important methods of paying labour remuneration falling under Piece Rate System:

a) Straight Piece Rate (b) Piece Rates with Guaranteed Time Rates and (c) Differential Piece Rates.

a) Straight Piece Rate: Under this system workers are paid according to the number of units produced at a given rate per unit. Thus, total earnings of each worker are calculated on the basis of his output irrespective of the time taken by him. The following formula is used for measuring piece work earning:

Straight Piece Work Earnings = Units Produced × Rate Per Hour

b) Piece Rate with Guaranteed Time Rates: Under this method, the worker earning from piece work less than the guaranteed minimum wage, will get the fixed amount of

guaranteed time rate. A guaranteed rate would be paid per hour rate or day rate or week rate.

c) Differential Piece Rates: This system is designed to provide for variation of piece rates at different levels of output. Accordingly increase in wages is proportionate to increase in output. Under this system efficient workers get ample reward and at the same time inefficient workers are motivated to earn more. The following are the important types of differential piece rates:

i)Taylor's Differential Piece Rates System.

ii) Merrick's Differential Piece Rates System.

iii) Gant Task Bonus Plan.

i) Taylor's Differential Piece Rates system

F.W. Taylor, who is the father of scientific management, introduced this plan. Under this system, two piece rates are applicable on the basis of standard of performance established. Accordingly one is high rate and the other one is lower rate. Thus high piece rate is applicable for standard and above the standard performance. Lower piece rates are applicable for those workers with below the standard performance.

Example 01:

Calculate the earnings of workers A and B under Straight Piece rate system and Taylor's Differential piece Rate system from the following Particulars: Standard time allowed 50 units per hour.

Normal time rate per hour Rs. 100 Differentials to be applied.

80% of piece rate at or above standard. 120% of piece rate at or above standard.

In a day of 8 hours A produced 300 units and B produced 450 units.

Solution 01:

Calculation of Piece Rates:

Standard Production Per Hour = 50 units

Standard production for 8 hours = 50 × 8 = 400 units

Rate Per Hour = Rs. 100

Piece Rate Per Unit = 100/50 = 2%

Straight Piece Rate System

A for 300 units @ Rs. 2 = 300 × 2 = Rs. 600

B for 450 units @ Rs. 2 = 450 × 2 = Rs. 900

Low Piece Rate at 80% differential = 2*80/ 100 = 1.60

High Piece Rate at 80% differential = Rs. 2.40

Standard production in 8 hours = 8 × 50 units per hour = 400 units

Earnings

A produced 300 units (below standard)= 300 × 1.60

Therefore Low Piece Rate of Rs. 1.60 applicable = Rs. 480

B produced 450 units (below standard)= 450 × 2.40

Therefore High Piece Rate of Rs. 240 applicable = Rs. 1080

ii) Merrick Differential Piece Rate System:

This is also termed as Multiple Piece Rate System. This plan is designed to overcome the drawback of Taylor's Differential Piece Rate System. Under this method, three piece rates are applied with different levels of performance. Accordingly

Performance	Differential Piece Rate
1) Less than 83%	Normal Piece Rate (or) BasicPiece Rate
2) From 83% to 100%	110% of Normal Piece Rate
3) More than 100%	120% of Normal piece Rate

iii) Gantt's Task Bonus Plan:

This system is designed by Henry L. Gantt. Under this system standard time for every task is fixed through time and motion study. The main feature of this system is a good combination of time rate, differential piece rate and bonus. In this system day wages are guaranteed to all workers. Wages under this system are calculated as follows:

Performance	Earnings
(Output)	
1) Output Below Standard	Time Rate (Guaranteed)
2) Output at Standard	Wages of Time Rate plus Bonus of 20% of the Time Rate
3) Output at Above Standard	High Piece Rate on worker's output

9.10 BONUS SYSTEM OR INCENTIVE SCHEMES

Incentive Scheme of wage payment is also known as Premium Bonus Plans. It is introduced in order to increase production with ensuring proper industrial climate. Wage incentive plans may be of two types: (A) Individual Incentive Plans and (B) Group Incentive Plans.

A. INDIVIDUAL INCENTIVE PLANS: Under individual incentive plans, remuneration can be measured on the performance of the individual worker. In the case of the group incentive scheme earnings can be measured on the basis of the productivity of the group of workers or entire work force of the organization. Various types of incentive schemes are combinations of time and piece rate systems. Different individual incentive plans are discussed below—

1) Halsey Premium Plan: This plan was developed by F.A. Halsey. This system also termed as Split Bonus Plan or Fifty-Fifty Plan. Under this plan, standard time is fixed for each job or operation on the basis of past performance. If a worker completes his job within or more than the standard time then the worker is paid a guaranteed time wage. If a worker completes his job within or less than the standard time, then he gets a bonus of 50% of the time saved plus normal earnings. Under this method, the total earnings are calculated as follows:

Total Earning = Guaranteed Time Wages + Bonus of 50% of Time saved

(Or)

Total Earning $= T \times R + 50\% (S - T) R$

Where T - Time Taken; R - Hourly Rate; S - Standard Time

Total Earnings = Time taken × hourly rate + (Time Saved × Hourly Rate)

Example 02:

Calculate the total earnings of the worker under Halsey Premium Plans:

Standard Time 12 hours

Hourly Rate Rs. 3

Time Taken 8 hours

Solution 02:

Earnings under Halsey Premium Plan:

Standard Time = 12 hours

Time Taken = 8 hours

Time Saved = Standard Time - Time Taken

= 12 - 8 = 4 hours

Rate per hour = Rs. 3

Total Earnings = T × R + 50% (S - T) R

= 8 * 3 + 50% (4*3) = 24+6 = 30

Merits:

- It is simple to understand.
- Total earnings of each worker can be easy to calculate.
- Both employer and employee get equal benefit of time saved.
- This system not only benefits efficient worker but also provides average worker to get guaranteed minimum wages.
- This system is based on time saved and it can reduce the labour cost.

Demerits:

- Lack of co-operation among the employees.
- Under this system establishment of standard is very difficult.
- Earning are reduced at high level of efficiency.

2) The Halsey -Weir Scheme: Under this system the worker gets the bonus of 30% of the time saved instead of 50% of time saved under

Halsey Plan. Except for this, Halsey Plan and Halsey-Weir Systems are similar in all other respects.

3) Rowan Plan: This plan was introduced by James Rowan of England. It was similar to the Halsey Plan in many respects except that it differs in calculation of bonus. Under this system, bonus is determined as the proportion of the time taken which the time saved bears to the standard time allowed. Under this system the following formula is applied to calculation of bonus:

$$Bonus = \frac{Time\ Saved}{Standard\ Time} * Time\ Wages$$

$$Total\ Earnings = Time\ taken \times Hourly\ Rate + \frac{Time\ Saved}{Standard\ Time} \times T \times R$$

Time Saved = *Standard Time - Time Taken*

Time Wages = *Time Taken × Hourly Rate*

Example 03:

From the following information, calculate total earnings of a worker under Rowan System:

Standard Time = 10 Hrs.

Time Taken = 08 Hrs.

Rate per hour = Rs.03

Solution 03:

Calculation of total earnings under Rowan Plan:

Standard Time = 10 hours

Time Taken = 8 hours

Time Saved = Standard Time - Time Taken

= 10 - 8 = 2 hours Rate per hour = Rs. 3 Per hour

$$\text{Total Earnings} = T \times R + \frac{\text{Time Saved}}{\text{Standard Time}} \times T \times R$$

$$= 8*3 + 2/10 * 8*3 = 24*4.8 = 28.8$$

4) Emerson's Efficiency Sharing Plan: Under this plan, earning of a worker is by combining guaranteed day wages with a differential piece rate. Accordingly the level of efficiency is determined on the basis of establishment of standard task for a unit of time. If the level of worker's efficiency reaches 67% the bonus is paid to him at a normal rate. The rate of bonus increases in a given rate as the output increases from 67% to 100% efficiency. Above 100% efficiency, the bonus increases to 20% of the wage earned plus additional bonus of 1% is added for each increase of 1% in efficiency

5) Barth Variable Sharing Plan: This scheme introduced to attract newly recruited and skilled employees who are motivated to learn work. It provides sufficient incentives to inefficient workers who are motivated to increase productivity. Earning under this method is calculated by applying the following formula:

Earnings = Rate per hour × Standard Time x Time taken

6) Bedaux Point Premium System: This plan was introduced by Charles E. Bedaux in 1911. Under this plan, standard time fixed for each operation or job is expressed in terms of Bedaux point or 'B'. For example, a standard time of 360 B means the operation or job should be completed within 360 minutes. The chief advantage of this plan is that it can be applied to any kind of job. Under this system, worker is paid at the time for actual hours worked and 75% of the wages

for the time saved are paid as bonus to the worker and 25% to the foremen, supervisors etc. The following is the formula for calculation of total wages of a worker:

Total earnings = S x R + 75% of R (S —— T)

7) Accelerating Premium Bonus Plan: Under this plan, bonus is determined on the basis of time saved unlike a fixed percentage under Halsey Plan and as decreasing percentage under Rowan Plan. The bonus is paid to workers at an increased rate. This provides increasing incentives to efficient workers.

B. GROUP OR COLLECTIVE BONUS PLAN: The incentive schemes explained so far as applicable to individual performance depending directly on production. However it is not the individual workers who produce the goods or services (operation) alone but group of several other workers are required to jointly perform a single operation. It is, therefore, essential that a group incentive scheme be introduced. Bonus is calculated for a group incentive scheme. The bonus is calculated for a group of workers and the total amount is distributed among the group of workers on any one of the following basis:

a) Equally by all the workers of the group.

b) Pro-rata on the time rate basis.

c) Pre-determined percentage basis.

d) Specified proportion basis.

The following are the important types of group incentive bonus plans:

1) Budgeted Expenses Bonus Plan: Under this method, bonus is determined on the basis of savings in actual expenditure compared with total budgeted expenditure.

2) Priest man Bonus Plan: Under this plan standard performance is fixed by the management and committee of works. The group of workers get bonus when actual performance exceeds the standard performance irrespective of individual's efficiency or inefficiency.

3) Towne's Gain-Sharing Plan: Under this plan, bonus is calculated on the basis of savings in labour cost. The group of workers get bonus when actual costs is less than the standard costs, one-half of the savings is distributed among workers including foremen in proportion with the ages earned.

4) Scanlon Plan: Scanlon Plan is designed with the chief aim of reducing the cost of operations in order to increase the production efficiency. This plan is generally

applicable in industries where the operation cost is high. Under this scheme, bonus is determined on the basis of standard costs or wastages and percentage of the reduction in operation cost.

9.11 INDIRECT MONETARY INCENTIVE

Indirect schemes are regarded beneficial to both employers and workers. Under indirect monetary incentives workers are given a share of profit and co-partnership.

Profit Sharing: Profit sharing and bonus is also known as Profit Sharing Bonus. Under this scheme, there is an agreement between the employer and employee by which employee receives a share of the profits which is fixed in advance. Accordingly profit sharing bonus refers to the distribution of profit on the basis of certain percentage of one's monthly earnings. The amount to be distributed depends on the profits earned by an enterprise. The proportion of the profits to be distributed among the employees is determined in advance.

Co-partnership: This system provides not only a worker to become partner in the business but also to share in the profit of the concern. There are different degrees of partnership and share of responsibilities allowed to the workers to take part in its control.

9.12 NON –MONETARY INCENTIVE SCHEME

Under this system, employees are provided better facilities, instead of additional monetary payments. Some of the examples of non-monetary incentives are free education for children rent free accommodation, medical facilities canteen facilities, welfare facilities and entertainment facilities etc.

9.13 REQUISITES OF A GOOD INCENTIVE PLAN

A good incentive plan should have the following characteristics:

1. Simple: It should be simple to understand and easy to operate.

2. Economical: It should be economical to introduce and operate**.**

3. Fair: It should be fair to both employees and employer.

4. Guaranteed Wages: It should guarantee hourly wages to every worker irrespective of level of his efficiency.

5. Adequate Incentive: It should provide adequate incentive to efficient workers.

6. Earning Limitations: It should place no limit on the earnings of workers.

7. Penalty: It should not penalise the workers for reason beyond their control such as machine break down, power failure etc.

8. Prompt Payment: It should provide for prompt payment of incentives at short intervals of time.

9. Moral Boosting: It should be capable of improving the morale of workers.

10. Managerial Support: It should have managerial support in so far as production material, quality control, maintenance, and non-monetary incentives are concerned.

11. Flexibility: It should be flexible enough so as to introduce the necessary changes (if any required)

9.14 LET US SUM UP

• Labour turnover signifies the movement of workers into and out of the organisation due to accession or separation during a particular period of time.

• Idle Time is that time during which the workers spend their time without giving any production or benefit to the employer and concern.

• Abnormal idle time refers that any loss of time which may occur due to some abnormal reasons

• Normal idle time wages is treated as a part of cost of production.

• Abnormal idle time cost is not included as a part of production cost and is shown as a separate item in the Costing Profit and Loss Account.

• The term “Over time” refers the extra work done beyond the normal working hours or scheduled time by a worker.

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• The term "Over time" refers the extra work done beyond the normal working hours or scheduled time by a worker.

9.15 REVIEW QUESTIONS

Q 1: What do you mean by ideal wage system?

Q 2: What are the different methods of wage payment?

Q 3: Critically examine the advantages and disadvantages of time wage system.

Q 4: What are the differences between time rate system and piece rate system?

Q 5: What do you understand by piece rate system? Discuss the merit and demerits of piece rate system.

Q 6: What do you understand by Taylor's Differential Piece Rate system? Explain its significance.

Q 7: What do you mean by ideal wage system?

What are the different methods of wage payment?

Q 8: Critically examine the advantages and disadvantages of time wage system.

Q 9: What are the differences between time rate system and piece rate system?

Q 10: What do you understand by piece rate system? Discuss the merit and demerits of piece rate system.

Q 11: What do you understand by Taylor's Differential Piece Rate system? Explain its significance.

Q 13: Write short notes on:

(a) Halsey Plan, (b) Rowan Plan, (c) Emerson's Efficiency Plan, (d) Halsey-Wair Plan, (e) Gantt Task Bonus Plan, (f) Barth's System.

Q 14: What do you mean by Collective Bonus Plan? Explain the type of Group Incentive Plans.

UNIT-10: CLASSIFICATION AND DISTRIBUTION OF OVERHEADS

LEARNING OBJECTIVES

After studying this unit, you will be able to:

- explain the meaning of overhead and the basis of its classification
- discuss the allocation and apportionment of overheads
- explain the re-apportionment of service department costs to production department and its methods.

STRUCTURE

10.1 INTRODUCTION

Overheads can be defined as 'burden' or 'on cost'. These overheads represent costs which are 'over-the-head' of direct material, direct labour and direct expenses (i.e., prime cost). These are additional cost incurred in the manufacturing process. According to ICMA terminology, an overhead has been defined as the "aggregate of indirect material cost, indirect labour cost and indirect expenses." In order to determine whether an item of cost is overhead or not, it should be seen if it is possible to identify the item of cost with cost unit or cost centre. If this identification is not possible then the item of cost should be considered as an item of overhead cost. As for example, rent and rates, heating and lighting, power etc cannot be identified with finished products. Hence, they

are obviously overheads. Sometimes, it may not be convenient to identify an item of cost with finished product. In such a case the item of cost is again treated as overheads. For example, nails used in furniture making and buttons used in readymade garments are overheads.

10.2 CLASSIFICATION AND CONTROL OF OVERHEADS

Overheads can be classified according to their behavioural pattern or managerial functions as under:

Overheads may be fixed, variable and semi-variable in case of behavioural point of view.

FIXED OVERHEADS: It remains constant irrespective of the level of output or production. Fixed overhead remain fixed in aggregate but it tends to vary per unit when the level of production undergoes a change. Managing director's salary, factory rent, audit fees etc are examples of fixed overheads.

VARIABLE OVERHEADS: Variable overheads are those indirect expenses which tend to vary in direct proportion to the changes in the level of production. They increase or decrease exactly according to the change in the volume of output. Variable overheads per unit remain constant but they change in aggregate with change in the level of output. Examples of variable overheads are like oil and fuel, indirect materials, indirect labour, stores consumed, and salaries of salesmen etc.

SEMI-VARIABLE OVERHEADS: It is also known as semi-fixed overheads. Basically these are indirect expenses which neither remains fixed nor they vary directly with the change in the level of output. These overheads are partly fixed and partly variable in nature. A part of these expenses remain constant upto a certain level and beyond that they tend to change with change in the level of activity. Some examples of semi-variable overheads are like cost of power, telephone, repairs and maintenance, depreciation of machineries working in multiple shifts etc.

Classification of overheads from the point of view of behaviour into fixed, variable and semi-variable is particularly useful for control purposes and also in the following areas:

Cost Control:

The classification of overheads into fixed and variable helps in controlling costs. Fixed

costs are generally policy costs which is difficult to be controlled. These costs are not affected by any variation in production or level of activity and therefore, they are more or less non controllable. Variable expenses vary with the volume of output. The management can control these costs by adopting several cost control devices.

Decision Making:

The classification of overheads between fixed and variable also helps in decision making. For example, decision regarding the price to be charged during depression or recession or for local and export sales etc. Similarly, decision to make or buy, lease or purchase, shut down or continue etc are also taken after classifying the costs into fixed or variable costs.

Break Even Analysis:

The classification of overheads into fixed and variable helps in the preparation of breakeven charts for undertaking a study of cost-volume- profit relationship which is very much essential for profit planning, policy formulation and control.

Flexible Budgeting:

The classification of overheads into fixed and variable helps in the preparation of flexible budget. It enables a firm to estimate costs for different levels of activity and make comparison with the actual expenses incurred.

Recovery or absorption of overheads:

The classification of overheads into fixed and variable helps in determining separate absorption rates for fixed and variable overheads. The fixed overhead rate also serves as a measure of utilization of facilities and the under absorption indicates the extent of idle capacity

10.3 ALLOCATION AND APPORTIONMENT OF OVERHEADS

Allocation is the process by which cost items are charged direct to a cost unit or cost centre. It is the process of charging the traceable amount of overhead to cost centre or cost unit. Overhead costs by their very nature cannot often be related to one particular cost centre. Where a cost is directly attributed to a department, e.g., electricity metered separately for a particular department, allocation can take place. It is like direct allotment of the cost to a particular department for which it was incurred. If a cost can

be specifically identified with a department then that cost is allocated to that department. According to CIMA cost allocation is "the charging of discrete, identifiable items of cost to cost centres or cost units. Where a cost can be clearly identified with a cost centre or cost units, then it can be allocated that particular cost centre or cost units." For example, depreciation of machinery of machining department can be directly allocated to machining department. The salary of stores clerk can be allocated to stores department. Cost of coal used in Boiler can be directly allocated to Boiler House division.

Some costs cannot be identified as arising from the activities of one specific department or function. Non allocable cost, however, must be apportioned on some logical basis to be divided between related cost centres. CIMA defines it as "the allotment of two or more cost centres of proportions of the common items of cost and the estimated basis of benefits received." As for example, rent, rates and taxes incurred for the entire factory cannot be directly allocated to different cost centres, but can be apportioned to more than one cost centre on some equitable basis for benefits received. The basis normally adopted for rent, rates and taxes being the floor area occupied by various cost centres. Thus, apportionment is the division of cost among two or more centres in proportion to the estimated benefits received applying some acceptable basis. The following chart will illustrate the point:

Sl No	**Types of Overheads**	**Basis of Apportionment.**
1	Rent, rates, repairs, insurance and depreciation of building	Area occupied
2	Lighting area occupied.	Number of lighting points or
3	Power or machine hours worked.	Horse power of machineries
4	Depreciation, insurance,repairs and maintenance of plants and vehicles	Book value of assets or capital costof assets.
5	Personnel, staff welfare, canteen expenses etc.	No of employees in each department or wages paid.
6	Stores expenses value of material issued or stored.	No of stores requisition served or
7	Carriage Inward	Value of materials purchased.
8	Maintenance of plants	Maintenance hours

9	Inspection expenses department.	No of employees in production
10	Remuneration of works director	Direct labour hours, wages paid or number of employees.

Distinction between allocation and apportionment of overheads:

1. Under allocation of overheads, the entire amount is charged to a particular department while under apportionment only a proportionate amount is charged to a particular department.

2. Allocation is a first step in departmentalization of overheads whereas apportionment is the next step.

3. Allocation is a simple process while apportionment is a complicated one.

4. In case of allocation, indirect cost can be conveniently identified with a particular department while it is not possible to identify overheads to a department under apportionment process.

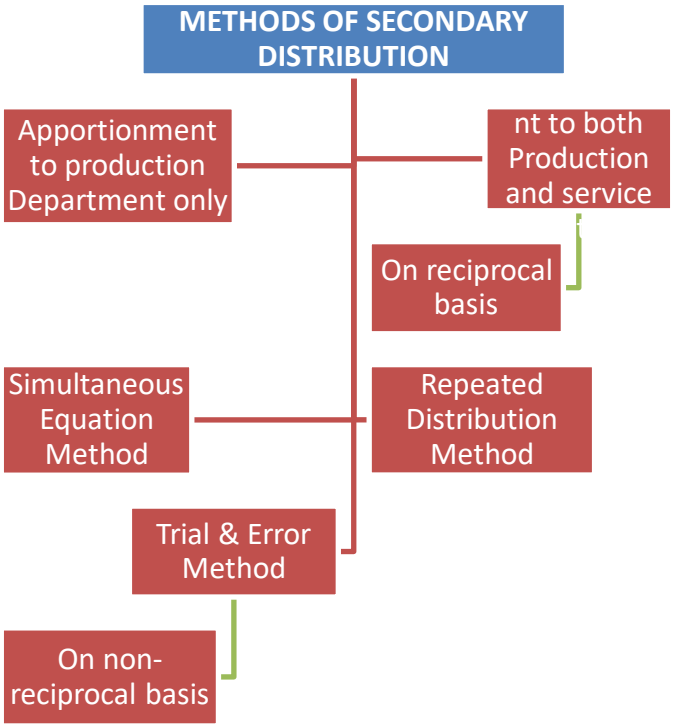
10.4 REAPPORTIONMENT OF SERVICE DEPARTMENT COSTS TO PRODUCTION DEPARTMENTS AND ITS METHODS

The costs incurred in the service department need to be reapportioned to the production departments or to the cost centres where production is going on. This process of reapportionment of overhead expenses is known as 'Secondary Distribution'. The chart given below shows various bases of apportionment which may be adopted for service departments:

Sl.No.	Service department costs	Basis of apportionment.
1	Maintenance department	Hours worked for each department
2	Payroll or time keeping	Total labour or machine hours ornumber of employees in each department.
3	Employment or personnel department	Rate of labour turnover or no of employees in each department.
4	Store keeping department	Number of requisitions or value of materials of each department.
5	Purchase department value of materials in each	Number of purchase orders or department.
6	Welfare, ambulance, canteen services	Number of employees in each department

7	Building service department	Area available in each department
8	Internal transport services	Weight or value or graded product handled or distance covered.
9	Transport department	Crane hours, truck hours, or mileage etc.
10	Power House (Electric power cost)	Wattage, horse power of machines etc.
11	Power House	Floor area or cubic content.

The different methods of re-apportionment of service department costs to production departments are as follows:



Apportionment to Production Department Only:

Under this method, the costs of service departments are directly apportioned to production departments ignoring the service rendered by one service department to another service department.

Apportionment to both Production and Service Departments:

Under this method, the costs of service department are apportioned to both production departments and other service departments on some equitable basis. This is usually done on reciprocal basis or non-reciprocal basis.

Simultaneous Equation Method:

Under this method, the true cost of the service departments are ascertained first with the help of simultaneous equations which are subsequently re-distributed to production departments on the basis of percentage of service rendered. It is the most popular method.

Repeated Distribution Method:

Under this method, the totals as shown in the departmental distribution summary are put in a line. Then the services department's total are exhausted in turn repeated according to the agreed percentage of services rendered until the figures become too small to matter.

Trial and Error Method:

Under this method, the cost of one service department is apportioned to another centre. The cost of another centre plus the share of cost received from the first centre is again apportioned to the first cost centre and this process is repeated till the balancing figure becomes negligible.

10.5 LET US SUM UP

- The concept of Overhead besides knowing the meaning of overhead and the basis of its classification.
- The need for control of overheads.
- The meaning of allocation and apportionment of factory overhead and the basis of such apportionment and the distinction between allocation and apportionment.
- The methods used for re-distribution of service department cost to production department.

10.6 REVIEW QUESTIONS

Q 1: What do you mean by Overheads? What are the advantages of classifying overheads into fixed and variable?

Q 2: What do you mean by factory overheads? Explain the various bases of apportionment of overheads to various departments with illustrations as to items of expenses.

Q 3: Explain the different methods of apportionment of service department cost to production departments.

Q 4: Define cost allocation and cost apportionment. Explain fully the distinction between cost allocation and cost apportionment.

Q 5: What are the different methods of secondary distribution of overheads? Explain in brief the three methods available for dealing with reciprocal services giving examples for each.

UNIT-11: ABSORPTION OF FACTORY OVERHEADS

LEARNING OBJECTIVES

After studying this unit, you will be able to:

- describe the meaning of overhead absorption
- discuss the overhead rates
- outline the methods of absorption overhead

STRUCTURE

11.1 INTRODUCTION

In the earlier unit we discussed about the overhead, now in this unit you will get a fair idea on the concept of absorption of overhead. Here we are going to discuss the meaning of overhead absorption. The overhead rates will also be discussed.

And at the end of the unit the different methods of absorption overhead will be discussed.

11.2 MEANING OF OVERHEAD ABSORPTION

Absorption of overhead is also termed as levy, recovery, or application of overhead. Cost absorption refers to the process of absorbing all overhead costs allocated to apportion over particular cost centre or production department by the unit produced. Accordingly, the distribution of the overhead cost to the cost centers or cost units is

known as Overhead Absorption.

11.3 OVERHEAD RATES

The apportionment of overhead expenses is done by adopting suitable basis such as output, materials, prime cost, labour hours, machine hours etc. In order to determine the absorption of overhead in costs of jobs, products or process, a rate is calculated and it is called as "Overhead Absorption Rate" or "Overhead Rate." The overhead rate can be calculated as below:

$$\text{Overhead Rate} = \frac{\text{Overhead Expenses}}{\text{Total Quantity or Value}}$$

Different overhead rates are applied based on the features and objectives of the business organization. The following are the important overhead absorption rates generally employed:

1) Actual Overhead Rate
2) Predetermined Overhead Rate
3) Blanket Overhead Rate
4) Multiple overhead Rate
5) Normal Overhead Rate
6) Supplementary Overhead Rate

Each of the above overhead absorption rates has been explained in the following pages:

1) Actual Overhead Rate: Actual overhead rate as otherwise called the historical rate. This rate is calculated by dividing the actual overhead absorbed by the actual quantity or value of the base selected for a particular period. Assuming that overhead rate is calculated on monthly basis, the following formula is expressed as:

$$\textit{Actual Overhead Rate} = \frac{\textit{Actual Overhead during the month}}{\textit{Actual Quantity or value of the base for the month}} \times 100$$

2) Predetermined Overhead Rate: Predetermined overhead rate is determined in advance of actual production and the rate is computed by dividing the budget overhead for the accounting period by the budgeted base for the period. The formula is:

$$\textit{Pre-determined Overhead Rate} = \frac{\textit{Budgeted Overheads for the Period}}{\textit{Budgeted base for the Period}} \times 100$$

3) Blanket Overhead Rate: Blanket overhead rate is also termed as Single Overhead Rate. A single overhead rate when computed for the entire factory is known as Blanket

Rate. It is calculated as:

$$\text{Blanket Rate} = \frac{\text{Overhead of Entire Factory}}{\text{Total Quantum of the Base Selected}}$$

Single rate may be applied suitably in small concerns and only where a single product is manufactured.

4) Multiple Overhead Rate: Multiple overhead rates involves computation of separate rates for each production department, service department, cost centre, each product or line and for each production factor. The following formula is used for calculating multiple overhead rate:

$$\text{Multiple Overhead Rate} = \frac{\text{Overhead Cost Allocated and Apportioned to Each Cost Centre}}{\text{Corresponding Base}}$$

5) Normal Overhead Rate: Normal Overhead Rate is a predetermined rate calculated with reference to normal capacity. It is calculated as:

$$\text{Normal Overhead Rate} = \frac{\text{Normal Overhead}}{\text{Base at Normal Capacity}}$$

These are used in addition to some other rates and is calculated as under:

$$\text{Supplementary Overhead Rates} = \frac{\text{Actual Overhead Incurred - Absorbed Overhead}}{\text{Base Unit or Hours}}$$

11.4 METHODS OF OVERHEAD ABSORPTION

There are number of methods applicable for computing overhead absorption rate. The following are the various methods of absorbing "Manufacturing Overhead" depending upon the suitable basis selected for the purpose:

1. Direct Material Cost Method
2. Direct Labour Cost Method
3. Direct Labour Hours Method
4. Prime Cost Method
5. Unit of Output Method
6. Machine Hour Rate Method

DIRECT MATERIAL COST METHOD:

Under this method, the rate of absorption is calculated on the basis of direct material cost method. The rate of manufacturing overhead absorption is determined by dividing the manufacturing overhead by the direct material cost. The result obtained the rate of absorption is expressed as percentage. Thus, the overhead rate is calculated by the following formula:

$$\text{Direct Material Percentage Rate} = \frac{\text{Factory Overheads}}{\text{Direct Material Cost}} \times 100$$

DIRECT LABOUR COST METHOD:

Direct Labour Cost Method is also termed as Direct Wages Method. Under this method direct wage rate can be determined by dividing the estimated factory overhead cost apportioned by the predetermined direct wages, and the result obtained is expressed as a percentage. The following formula for calculating the percentage rate is:

$$\text{Percentage of Direct Labour Rate} = \frac{\text{Factory Overhead}}{\text{Direct Wages}} \times 100$$

DIRECT LABOUR HOURS METHOD:

Under this method the rate is determined by dividing the production of Factory overheads by direct labour hours of each department. This method is designed to overcome the objections of direct labour cost method. This method is most suitable in such industries where the production is carried out manually or by skilled labours. Thus, the direct labour hour rate will be calculated by applying the following formula:

$$\text{Direct Labour Hour Rate} = \frac{\text{Factory Overhead}}{\text{Direct Labour Hour}}$$

PRIME COST METHOD:

Under this method, both direct material cost and direct labour cost are taken into account for determination of recovery rate. The actual or predetermined rate of factory absorption is computed by dividing actual or budgeted overhead expenses by the aggregate of direct material or direct labour cost of the department. The following formula is used for calculation of overhead recovery rate:

$$\text{Overhead Recovery Rate} = \frac{\text{Factory Overhead}}{\text{Prime Cost}} *100$$

UNIT OF OUTPUT METHOD:

This method is also termed as Production Unit Method of Cost Unit Rate method. Under this method absorption rate is determined on the basis of number of units produced is known as Cost Unit Rate. The recovery rate is calculated by dividing the actual or budgeted factory overheads by the number of cost units produced. The formula is:

$$\text{Cost Unit Rate} = \frac{\text{Factory Overhead}}{\text{No. of Units Produced}}$$

This method is most suitable in such industries where the production of same grade is carried out.

MACHINE HOUR RATE:

Machine hour rate means the cost of expenses incurred in running a machine for one hour. It is one of the scientific methods of absorbing factory expenses where the process of manufacturing are carried out by machines. Under this method, overhead costs are allocated on the basis of the number of hours a machine or machines are used for a particular job. According to the Institute of Cost and Management Accountants, England a machine hour rate is "an actual or predetermined rate of cost apportionment or overhead absorption, which is calculated by dividing the cost to be apportioned or absorbed by the number of machine hours expended or to expend."

The machine hour rate is determined by dividing the amount of overhead cost to be apportioned or absorbed by the number of machine hours. Machine hour rate can be calculated as below:

$$\textit{Machine Hour Rate} = \frac{\textit{Factory Overhead}}{\textit{Machine Hours}}$$

Calculation of Machine Hour Rate: The following steps are required for computing the machine hour rate:

1) Identify the overhead expenses relating to a specific machine or group of machine in order to require for computing machine hour rate.

2) Each machine or group of machine treated as a cost centre.

3) Manufacturing overhead or machine expenses are grouped into two types:

   a) Fixed or Standing Charges

   b) Variable Machine Expenses.

Fixed or Standing Charges: Fixed or Standing Charges which remain constant irrespective of the use of machine. For example, rent, insurance charges, rates, supervision etc.

Variable Machine Expenses: These expenses are variable with use of the machine. For example, power, depreciation repairs etc.

4) An hourly rate of fixed or standing charges will be calculated by totaling of fixed charges and dividing by the number of normal hours worked by machine.

5) Normal working hours are calculated by adding the cost relating to non-productive time i.e. normal ideal time for maintenance and setting up etc.

6) Separate hourly rate for each machine expenses will be calculated.

7) The total of the standing charges rate and machine expenses rates per hour will give the machine hour rate.

Basis for apportionment of Machine Expenses

Expenses	*Basis*
Fixed or Standing Expenses :	
1) Rent and Rates	*Floor area occupied by each machine.*
2) Heating and Lighting	*No. of points used or Floor area or heating any machine*
3) Supervision	*Time spent on each machine*
4) Lubricating Oil and Consumable Stores	*Machine hours, Past experience or Capital value.*
5) Insurance	
Machine Expenses :	
1. Depreciation	*Value of Machine*
2. Power	*Horse power of each machine*
3. Repairs	*Cost of repairs spread over its working life.*

Advantages

1) It helps to measure the relative efficiency of different machines.

2) It facilitates comparison of cost of operating different machines.

3) It helps to ascertain idle time of machines relating to non-productive time.

4) It is the most desirable scientific method, where the time factor is taken into account.

Disadvantages

1) It involves more clerical labour in determining the number of machine hours worked.

2) It does not consider where the expenses not proportional to the working hours of machines.

3) It is very difficult to measure the machine hours where the works are completed without operating any machinery.

Example 01:

Calculate machine hour rate of Machine X

Consumable stores	**600**
Repairs	**800**
Heat and light	**360**
Rent	**1,200**
Insurance of building	**4,800**

Insurance of machines	**800**
Depreciation of machines	**700**
Room services	**60**
General charges	**90**
Normal working hours	**10,000 Hours**
Area of sq. fit.	**100**
Book value of machines	**12,000**

Solution 01:

Computation of Machine Hour Rate for Machine X

Particulars	*Total per hour Rs.*	*Rate per hour Rs.*
Standing Charges :		
Consumable stores	600	
Heat and light (360 × 100/600)	60	
Rent (1200 × 100/ 600)	200	
Insurance of building (4800 × 100/600) Insurance	800	
of Machine (800 ×12000 / 32000)	300	
Room Service (60 ×100 / 600)	10	
General charge (90 × 100 / 600)	15	
Total Standing charges	1, 985	
Standing charges per hour $\frac{1,985}{10,000}$ =		0.199

Machine Expenses:

Repairs (800 / 10,000)	0.080
Depreciation of machines (135.48 / 10,000)	0.014
Machine Hour Rate	0.293

Working Notes

1) Heat and light, rent, insurance of building, room service and general charges have been distributed on the basis of floor area.

2) Depreciation of machine has been calculated on the basis of book value of machines and working hours, i.e. 10,000 × 12000 (or) 120 : 500 = 6 : 25.

700 × 6/ 31 = Rs. 135.48.

3) Insurance of machine has been apportioned on the basis of book value of machines.

11.6 UNDER ABSORPTION AND OVER ABSORPTION OF OVERHEAD

Absorption of overhead may be based either on the actual rate or predetermined rate. If the actual rates are used, the costs having been actually incurred and overhead absorbed are equal. But in the case of predetermined rates, the costs have been determined in advance of incurrence of the overhead expenditure. This may lead to difference of overhead incurred and overhead absorbed. Such a difference of Overhead is said to be under absorption of overhead or over absorption of overhead.

According, the term over absorption means that the amount of overhead absorption is more than the actual is said to be over absorption of overhead.

The term under absorption of overhead means that the amount of overhead absorption is less than the actual overhead incurred is said to be under absorption of overhead.

CAUSE OF UNDER AND OVER ABSORPTION OF OVERHEAD

The following are some of the reasons for over and under absorption of overheads:

1) Actual overhead cost incurred may be more or less than the budgeted overhead.

2) Actual machine hours, labour hour and output may be lower or higher than the budgeted or predetermined base.

3) Seasonal fluctuations.

4) Wrong computation of overhead absorption rate, output and machine hours.

5) Under or over utilization of production capacity.

METHODS OF TREATMENT FOR OVERHEAD ADJUSTMENT

The following three important methods may be adopted for overhead adjustment and disposal of over or under absorption of overheads:

1) Carrying Over of Overheads

2) Application or use of supplementary rates

3) Write off to Costing Profit and Loss Account.

Carrying Over of Overheads: Under this method, the amount of over or under absorption is carry forward to the next year. This method may be adopted in situation where the normal business cycle extends for more than one year.

Application of Supplementary Rate: Under this method, the supplementary rate is adopted when the amount of under or over absorbed overheads is quite large. Supplementary rate is calculated by dividing the amount of under or over absorbed overheads by the actual base.

$$\text{Supplementary Rate} = \frac{\text{Amount of Under or Over Absorbed Overheads}}{\text{Actual Base}}$$

The supplementary rate may be used as positive supplementary rate or negative supplementary rate. In the case of positive supplementary rate it is intended to add under absorbed overhead to cost of production. A negative rate, however, adjusted the cost by deducting the amount of over absorbed overhead.

Write off to Costing Profit and Loss Account: Under this method, if the amount of under or over absorbed overhead is small it may be written off to Costing Profit and Loss Account. If due to some abnormal factors, the amount of under or over absorbed is large it should be transferred to profit and Loss Account.

11.6 LET US SUM UP

- The distribution of the overhead cost to the cost centers or cost units is known as Overhead Absorption.
- In order to determine the absorption of overhead in costs of jobs, products or process, a rate is calculated and it is called as "Overhead Absorption Rate" or "Overhead Rate."
- Over absorption means that the amount of overhead absorption is more than the actual is said to be over absorption of overhead.
- Under absorption of overhead means that the amount of overhead absorption is less than the actual overhead incurred is said to be under absorption of overhead.
- Administrative overhead are incurred in general for management to discharge its functions of planning, organizing, controlling, co- ordination and directing.
- Selling and distribution expenses are incurred for promoting sales, securing order, creating demand and distribution of products or output from producers to the ultimate consumers.

11.2 REVIEW QUESTIONS

Q 1: Explain absorption of overhead.

Q 2.What do you understand by overhead rates?

Q 3.Briefly explain the different kinds of overhead absorption rates.

Q 4.What do you understand by machine hour rate? How it is computed?

Q 5.What do you mean by absorption and over absorption of overhead? Brief explain the methods of treatment of under or over absorption of overheads.

Q 6. Compute Machine hour rate from the following data:

Cost of machine Rs. 1, 10,000

Installation charges Rs. 10,000

Estimated scrap value (after 15 years) Rs. 5,000 Rent and rates for the shop Rs. 200 P.M. General lighting for the shop Rs. 300 P.M. Insurance premium for the machine Rs. 960 P.a. Repairs and maintenance Rs. 1000 P.a.

Power consumption 10 units per hour Rate of power per 100 units Rs. 20

Estimated working hours per annum 2200 which include setting up time of 200 hours.

Shop supervisor's salary per month Rs. 600

The machine occupies d of the total area of the shop. The shop supervisor is expected to devote 1/5the of his time for supervising the machine

[Ans: Machine hour rate: Rs 7.95]

UNIT-12: TREATMENT OF OTHER OVERHEADS

LEARNING OBJECTIVES

After studying this unit, you will be able to:

- discuss the meaning and definition of administrative, selling and distribution overheads
- explain the accounting and control of administrative, selling and
- distribution overheads
- discuss about the distribution and absorption of selling and distribution overheads.

STRUCTURE

12.1 INTRODUCTION

In our previous units, we have already discussed in details about overheads, its classification, allocation, apportionment, absorption etc. In this unit, we will have further discussion on accounting and control of administrative, selling and distribution overheads. We all have now understood that overheads are also a very important cost element along with direct materials and direct employees. An organisation cannot ignore overheads either for the purpose of arriving at the cost of a job or a product or for controlling total expenditure.

Overheads are incurred not only in the factory of production but also on administration, selling and distribution. Administrative overheads are expenditures incurred on all activities relating to general management and administration of an organisation. Selling

overheads are expenses relating to sale of products and include all indirect expenses in sales management for the organisation. And distribution overheads are expenses incurred to make the product available for sale in the market.

12.2 ADMINISTRATIVE OVERHEADS

According to CIMA, London, Administrative overhead is defined as "The sum of those costs of general management and of secretarial accounting and administrative services, which cannot be directly related to the production, marketing, research or development functions of the enterprise." As per Cost Accounting Standards (CAS)-3 issued by the Council of the ICWAI, Administrative Overheads are defined as "Cost of all activities relating to general management and administration of an organisation." From the above definitions we can conclude that administrative overhead constitutes the expenses incurred in connection with the formulation of policy directing the organisation and controlling the operations of an undertaking.

For any organisation, controlling the administrative overheads is very difficult because unlike other variables like production or sales, they do not vary. Examples of such overheads are, office salaries, printing and stationery, office telephone, office rent, electricity used in the office, salaries of administrative staff etc. The size as well as control over these overheads depends largely on decisions of management. Organisations growing rapidly might face the problem of controlling Administrative Overheads. Further, multi-location set up leads to duplication of many administrative costs.

ACCOUNTING FOR ADMINISTRATIVE OVERHEADS

The accounting of administrative overheads may be done with the help three different methods as discussed below:

1) Apportioning Administrative Overheads between Production and Sales Departments: According to this method, it is assumed that administrative overheads are incurred both for production and for selling and distribution. Therefore these overheads should be divided on some equitable basis between production and selling and distribution activity. Under this method, administrative overheads lose their identity and get merged with production and selling and distribution overheads. The problem is of course, selection of basis to divide these overheads over the two

principal functions of production and selling.

2) Charging to Profit and Loss Account: Under this method, administrative overheads are charged to Costing Profit & Loss Account. According to this method, administrative costs are all time based costs and are not directly concerned with either the production or the selling and distribution functions. Hence these overheads should be treated as fixed cost and transferred to the Costing Profit and Loss Account. Further, it is difficult to determine a suitable basis for proportioning administrative overheads over production and sales departments.

3) Treating Administrative Overheads as a separate addition to Cost of Production & Sales: In this method, administrative overheads are considered as a cost of a distinct and identifiable operation of the organisation necessary to carry on its activity. Therefore these overheads are recovered separately on some equitable basis which may be on cost or sales basis.

CONTROL OF ADMINISTRATIVE OVERHEADS

Usually administrative overheads are of fixed nature and difficult to control at the lower level of management. However, some control may be exercised by the top management as they pertain to formulating policy and directing the organisation. The first step in the control mechanism is proper classification of expenses and departmentalisation. The actual expenses are collected for each department and then compared with a bench mark. Deviation are analysed and causes for increase are mitigated by fixing responsibility on the departmental head.

Following methods are usually applied to control administrative overheads:

(i) Figures of the previous period: Expenses could be compared with the figures of previous year and increase or decrease are analysed. However, comparison with previous year may not help as the condition may have totally changed from one year to the other. To overcome this difficulty, overhead absorption rates may be compared from period to period; the extent of over or under absorption will reveal the efficiency or otherwise of the department.

(ii) Control through budgets: According to this method, Budgets are estimates for the current year, and they take into account the changed conditions. They also built in the year's complete plan which would factor all changes in the cost structure. It is advisable to compare budgeted overheads with actual for control purpose.

(iii) Use of standards. Although very scientific, this method is difficult to operate.

Administrative activities (being very subjective) cannot be standardised. On a certain level it can be applied e.g. the time taken to process a voucher by accountant can be standardised, or time taken for processing a payment could be standardised.

12.3 SELLING AND DISTRIBUTION OVERHEADS

Selling overheads include the costs incurred in promoting sales and retaining customers. As per Cost Accounting Standards (CAS)-3, Selling Overheads, also known as Selling Costs, are the expenses related to sale of products and include all indirect expenses in sales management for the organization. Overheads incurred for getting orders from consumers are also Selling Overheads. Selling overheads are incurred after the production of products or services is completed and hence known as 'after-production costs'. Selling overheads are incurred to create and stimulate demand and increase the sales to the existing and potential customers.

On the other hand, overheads incurred for execution of order are called as Distribution Overheads. Distribution overheads are incurred to take the finished goods from the place of production to the place of resale or consumption. As per CAS-3, Distribution Overheads, also known as Distribution Cost, are the cost incurred in handling a product from the time it is ready for dispatch until it reaches the ultimate consumer.

Examples of Selling Overheads are sales promotion expenses, marketing expenses, salesmen's salaries and commission, advertising expenses etc. Examples of Distribution Overheads are warehouse charges, transportation of outgoing goods, packing, commission of middlemen etc.

ACCOUNTING OF SELLING AND DISTRIBUTION OVERHEADS

It is not easy to determine an entirely satisfactory basis for computing the overhead rate for absorbing selling overheads. Some expenses like sales commission, shipping costs, and direct selling expenses can be absorbed directly. The bases usually adopted are:

(a) Sales value of goods;

(b) Cost of goods sold;

(c) Gross Profit on sales; and

(d) Number of orders or units sold.

Generally, sales value of goods is assumed to be most logical basis for computing the overhead rate for absorbing selling overheads.

CONTROL OF SELLING AND DISTRIBUTION OVERHEADS

Selling and Distribution overheads are incurred to maximise the sales. Controlling such expenses is not an easy task because-

(i) The incidence of selling & distribution overheads depends on external factors such as distance of market, nature of competition etc. which are beyond the control of management.

(ii) They are dependent upon customers' behaviour, liking etc.

(iii) These expenses are of the nature of policy costs and hence not amenable to control.

The above problems of controlling selling & distribution overheads can be tackled by adopting the following steps:

(a) Comparing the figures of selling & distribution overhead with the figures of previous period.

(b) Selling & distribution overhead budgets may be used to control such overhead expenses by making a comparison of budgetary figures with actual figures of overhead expenses, ascertaining variances and finally taking suitable actions,

(c) Standards of selling & distribution expenses may be set up for salesmen, territories, products etc. The laid down standards on comparison with actual overhead expenses will reveal variances, which can be controlled by suitable action.

12.4 LET US SUM UP

- Administrative overhead constitutes the expenses incurred in connection with the formulation of policy directing the organisation and controlling the operations of an undertaking.
- For any organisation, controlling the administrative overheads is very difficult because unlike other variables like production or sales, they do not vary.
- Usually administrative overheads are of fixed nature and difficult to control at the lower level of management. However, some control may be exercised by the top management as they pertain to formulating policy and directing the organisation.
- Selling overheads are incurred after the production of products or services is completed and hence known as 'after-production costs'.
- Selling overheads are incurred to create and stimulate demand and increase the sales to the existing and potential customers.

- Overheads incurred for execution of order are called as Distribution
- Overheads. Distribution overheads are incurred to take the finished goods from the place of production to the place of resale or consumption.
- Sales value of goods is assumed to be most logical basis for computing the overhead rate for absorbing selling overheads.

12.5 REVIEW QUESTIONS

Q 1: What do you mean by Administrative Overheads?

Q 2: Write briefly about accounting and control of Administrative

Q 3: Give the meaning of Selling Overheads.

Q 4: Explain in details the accounting and control of Selling and Overheads.

Block-4

METHODS OF COSTING

Unit-13: Contract Costing

Unit-14: Procedure for Contract Costing

Unit-15: Process Costing

Unit-16: Treatment of Process losses and wastage

UNIT-13: CONTRACT COSTING

LEARNING OBJECTIVES

After studying this unit, you will be able to:

- Understand the meaning of contract costing.
- Know the features of Contract costing
- Know the difference between job and contract costing.

STRUCTURE

13.1 INTRODUCTION

Contract costing is a form of specific order costing where job undertaken is relatively large and normally takes period longer than a year to complete. Contract costing is usually adopted by the contractors engaged in any type of contracts like construction of building, road, bridge, erection of tower, setting up of plant etc.

A contract takes longer period to complete and the result of the contract can be known only after the completion of the contract. To have a better control over the contract and cost, it is necessary to have an idea of profitability of contracts at regular intervals or atleast in a year. For this purpose, a contractor needs to calculate expected profit or notional profit for a contract. It also helps in

profit comparison for a period and provide a good basis for performance measurement and evaluation of those who are engaged in the contract. The expected or notional profit in respect of each contract in progress (i.e. incomplete contracts) is transferred to the costing profit and loss account (consolidated) for the year to determine overall profitability of the contractor.

13.2 FEATURES OF CONTRACT COSTING

1. The major part of the work in connection with each contract is ordinarily carried out at the site of the contract.
2. The bulk of the expenses incurred by the contractor are considered as direct.
3. The indirect expenses mostly consist of office expenses, stores and works.
4. A separate account is usually maintained for each contract.
5. The number of contracts undertaken by a contractor at a time is usually few.
6. The cost unit in contract costing is the contract itself.

13.3 RECORDING OF CONTRACT COSTS

MATERIAL COST

All materials supplied from the stores or purchased directly for the contract are debited to the concerned contract account.

Contract Account (Contract No :) Dr.

To Stores Ledger Control A/c (Issued from stores) or,

To Cost Ledger Control A/c (Direct purchase)

In the case of transfer of excess material from one contract to another, cost of these excess materials are adjusted on the basis of Material Transfer Note.

Contract Account (Contract No. XYZ) Dr.

To Contract Account (Contract No. ABC)

In case the return of surplus material appears uneconomical on account of high cost of transportation, the same is sold and the concerned contract account is credited with the price realised. Any loss or profit arising therefrom is transferred to the Costing Profit and Loss Account.

Cost Ledger Control A/c Dr.

Costing Profit & Loss A/c (Loss) Dr.

To Contract A/c

To Costing Profit & Loss A/c (Profit)

Any loss of material due to theft or destruction etc. is transferred to the Costing Profit and Loss Account.

Costing Profit & Loss A/c Dr.

To Contract A/c

If any stores items are used for manufacturing tools, the cost of such stores items are charged to the work expenses account.

Works expenses A/c Dr.

To Stores Ledger Control A/c

(With amount of stores used for works)

Contract A/c Dr.

To Works expenses

(With amount of works used in the contract)

If the contractee has supplied some materials without affecting the contract price, no accounting entries will be made in the contract account, only a note may be given about it.

EMPLOYEE LABOUR COST

Workers employed on the site of the contract is regarded as direct employees (irrespective of the nature of the task performed) and the wages paid to them are charged to the concerned contract directly. If an employee is engaged concurrently in other contract also then the total wages paid is apportioned to the contacts on some reasonable basis, usually on time basis.

Contract A/cDr.

To Wages Control A/c

DIRECT EXPENSES

Direct expenses (if any) are directly charged to the concerned contract account.

Contract A/cDr.

To Direct Expenses A/c

INDIRECT EXPENSES

Indirect expenses (such as expenses of engineers, surveyors, supervisors, corporate office etc.) may be distributed over several contracts on certain reasonable basis as overheads.

Contract A/c Dr.

To Overheads A/c

PLANT AND MACHINERY

The value of the plant in a contract may be either debited to contract account and the written down value thereof at the end of the year entered on the credit side for closing the contract account, or only a charge (depreciation) for use of the plant may be debited to the contract account.

Contract A/c Dr.

To Plant and Machinery A/c (with cost)

Plant and Machinery A/c (with WDV) …. Dr.

To Contract A/c

Or

Contract A/c Dr.

To Depreciation on Plant and Machinery A/c

SUB-CONTRACT

Sub-contract costs are also debited to the Contract Account.

Contract A/c Dr.

To Cost of Sub-Contract A/c

Extra work: The extra work amount payable by the contractee should be added to the contract price. If extra work is substantial, it is better to treat it as a separate contract. If it is not substantial, expenses incurred should be debited to the contract account as "Cost of Extra work".

13.4 MEANING OF THE TERM USED IN CONTRACT COSTING

WORK-IN-PROGRESS: Work-in-progress in contract costing refers to the contract which is not complete at the reporting date. In Contract Accounts, the value of the work-in-progress consists of

i. the cost of work completed, both certified and uncertified
ii. the cost of work not yet completed
iii. and the amount of estimated/ notional profit.

In the Balance Sheet (prepared for management), the work-in-progress is usually shown under two heads, viz., certified and uncertified. The cost of work completed and certified and the profit credited will appear under the head 'certified' work-in-

progress, while the completed work not yet certified, cost of material, employee and other expenses which has not yet reached the stage of completion are shown under the head "uncertified" work-in-progress.

COST OF WORK CERTIFIED OR VALUE OF WORK CERTIFIED: A contract is a continuous process and to know the cost or value of the work completed as on a particular date; assessment of the completion of work is carried out by an expert (it may be any professional like surveyor, architect, engineer etc.). The expert, based on his assessment, certifies the work completion in terms of percentage of total work. The cost or value of certified portion is calculated and is known as Cost of work certified or Value of work certified respectively.

Mathematically:

(a) Value of Work Certified = Value of Contract × Work certified (%)

(b) Cost of Work Certified = Cost of work to date – (Cost of work uncertified + Material in hand + Plant at site)

COST OF WORK UNCERTIFIED: It represents the cost of the work which has been carried out by the contractor but has not been certified by the expert. It is always shown at cost price. The cost of uncertified work may be ascertained as follows:

	(`)	(`)
Total cost to date		xxx
Less: Cost of work certified	xx	
Material in hand	x	
Plant at site	xx	xxx
Cost of work uncertified	x	xxx
	xx	
	x	

PROGRESS PAYMENT: A Contractor gets payments for work done on a contract based on work completion. Since, a contract takes longer period to complete and requires large investment in working capital to progress the contract work, hence, it is desirable by the contractor to have periodic payments from the contractee against the work done to avoid working capital shortage. For this a contactor enters into an agreement with the contractee and agrees on payment on

some reasonable basis, which generally, includes percentage of work completion as certified by an expert.

Mathematically:

Progress payment = Value of work certified – Retention money – Payment to date

RETENTION MONEY: In a contract, a contractee generally keeps some amount payable to contractor with himself as security deposit. In a contract, a contractor undertakes to complete a job work on the basis of pre- determined terms and conditions and work specifications. To ensure that the work carried out by the contractor is as per the plan and specifications, it is monitored periodically by the contractee. To have a cushion against any defect or undesirable work, the contractee upholds some money payable to contractor. This security money upheld by the contractee is known as retention money. In some contracts the contractor has to deposit some security money before staring of the contract as a term of contract. This is known as Earnest money. If any deficiency or defect is noticed in the work, it is to be rectified by the contractor before the release of the retention money. Retention money provides a safeguard against the risk of loss due to faulty workmanship.

Mathematically:

Retention Money = Value of work certified – Payment actually made/ cash paid

CASH RECEIVED: It is ascertained by deducting the retention money from the value of work certified i.e.

Cash received = Value of work certified – Retention money

NOTIONAL PROFIT: It represents the difference between the value of work certified and cost of work certified. It is determined:

Notional profit = Value of work certified – (Cost of work to date – Cost of work notyet certified)

ESTIMATED PROFIT: It is the excess of the contract price over the estimated total cost of the contract.

13.5 DISTINCTION BETWEEN JOB COSTING AND CONTRACT COSTING

BASIS OF DISTINCTION	JOB COSTING	CONTRACT COSTING
Place of Work	Job work is carried in the factory premises.	Contract work is carried at the site.
Cost Unit	An order, an unit, batch of product may be taken as a cost unit	Each contract is a cost unit.
Fixation of Price	The prices of the jobs are fixed on the basis of nature of costs and policy adopted by the organization.	Bidding and other external forces have major influence in fixation of the offer price.
Nature of Expenses	Expenses are of both types direct and indirect.	A substantial part of expenses are direct in nature.
Receipt of Payment	The selling price of the job is paid after completing the job.	Contract Price is paid in several installments based on the progress of the work.
Accounting of Profit	Profit on job is entirely taken to profit and loss account.	In case of incomplete contracts, only proportionate profit is taken to P&L Account.

13.6 LET US SUM UP

- Contract costing is a form of specific order costing where job undertaken is relatively large and normally takes period longer than a year to complete.
- A contract takes longer period to complete and the result of the contract can be known only after the completion of the contract.
- In Contract Accounts, the value of the work-in-progress consists of

i. the cost of work completed, both certified and uncertified

ii. the cost of work not yet completed

iii. and the amount of estimated/ notional profit.

13.8 REVIEW QUESTIONS

Q 1: Discuss the features of contract costing.

Q 2: Explain the recording of contract costing.

Q 3: Distinguish between job and contract costing.

UNIT-14: PROCESS FOR CONTRACT COSTING

LEARNING OBJECTIVES

After studying this unit, you will be able to:

- prepare contract account and ascertain the notional profit on uncompleted contracts;
- explain bow profit taken to profit and loss account is determined; and
- explain how work in progress is shown in balance sheet.

STRUCTURE

14.1 THE PROCEDURE

There are two parties to a contract: i) The contractor, and ii) the contractee. Contractor is a person (or an organisation) who undertakes to do the job. Contractee is the person (or an oraganisation/a government agency) who assigns the job to the contractor. The contractor usually engages an architect who prepares the plans, structural designs, detailed drawings the tender documents, and also undertakes to supervise the complete contract. The tractor submits the tender to the contractee and, when it is approved, an agreement is signed by both the parties including the contract price and the terms of payment. It may provide for an 'escalation clause' to compensate the contractor for an unwarranted increase in prices and for other contingencies.

Since, the contract involves a large amount and a long period, payment is made at various stages of completion based on the architect's certificate. The contractee usually retains a certain percentage of the amount recommended for payment by the architect. This is called 'retention money'. It is in the form of security against defective work and penalties chargeable for delay in completion of the work. It is retained for a shod period (called warranty period) even after the completion of the contract. Thus, it is released to the contractor only after the warranty period is over.

14.2 TRATMENT OF IMPORATANT ITEMS

The contractor usually maintains a Contract Ledger in which a separate account is opened for each contract. It is a common practice to allot a distinguishing number to each contract, and all costs and revenues relating to a particular contract must be shown against the appropriate contract number.

Let us take some important items of contract costing and study their treatment in detail.

MATERIALS

i) Direct Materials: Most of the materials like bricks, cement, steel, etc. are delivered direct to the site. Their costs will be debited to the contract account.

ii) Stores materials: Some materials are received through material requisitions from store. The cost of the same should also be debited to the respective contract account

iii) Materials on site: At the end of an accounting year, the cost of materials on site is carried forward to the next year.

iv) Materials returned to the stores: The materials found surplus on site are returned to the stores. Their cost should either be deducted from materials issued (shown on the debit side) or credited to the contract account.

v) Materials stolen or destroyed: The cost of materials stolen or destroyed is treated abnormal loss. Hence the same should be transferred to the Profit and Loss Account and credited to the contract account.

LABOUR

i) All labour employed at the contract site should be regarded as direct labour and

charged direct to the contract account.

ii) As far as possible a separate wage sheet should be prepared for each contract.

iii) Wages accrued or outstanding at the end of the year should appear on the debit side of the contract account.

iv)Wages of labour employed at Head Office and Central Stores are considered as overhead cost. Hence, these should be allocated to all contracts on some equitable basis.

DIRECT EXPENSES

All expenses other than material and wages are charged to individual contracts as and when they are incurred. Direct expenses may include i) cost of special tools, jigs etc., ii) cost of designs, and iii) cost of hiring plant and machinery for the contract.

OVERHEADS

i) Direct allocation: Most of the expenses incurred in connection with a contract can be directly identified with each contract, e.g., supervisory salaries, staff amenities, repairs and maintenance of machinery, etc. These are directly allocated to the contract concerned

ii) Apportionment: It is only the Head Office expenses which will require an apportionment to various contracts on some equitable basis. Labour hour rate is the most common method used for this purpose. However, the overhead costs can also be apportioned in the ratio of wages or total expenses incurred on the respective contracts. The amount thus allocated to a contract must be debited to contract account.

PLANT AND MACHINERY

This includes cranes, trucks, excavators, bulldozers, mixers and lorries, etc. The plant and equipment may be taken on lease or purchased specifically for a contract. When it is taken on lease or hire, the leasing charges or the hire will be charged to the contract account. If the plant or equipment has been specially purchased for a particular contract, there are two ways of showing it in the contract account:

i) Contract account may be debited with the cost of plant sent to the site and then credited with its depreciated value when it is moved to another site. The difference between the cost and the depreciated value represents the depreciation charge. Similarly, at the end of the accounting period, an uncompleted contract is credited with the depreciated value which is later debited to the contract account at the beginning of the next year.

ii) Alternatively, depreciation may be calculated based on the period for which the plant has been used for the contract during the accounting year and debited to the contract account. Other plant costs such as maintenance, insurance, fuel, oil, etc. should also be debited to the contract account.

SUB-CONTRACTING

Sometimes, a sub-contractor is engaged for a special work connected with the main contract. For instance, in constructing a house, the jobs like painting, plumbing, special flooring, carpentry, etc. may be given to different sub-contractors. The cost of such jobs must be charged to the main contract.

VALUE OF WORK CERTIFIED

As stated earlier, part payment is made to the contractor at each stage of completion based on architect's certificate. These stages usually are: plinth level, wails, roofing, plastering, flooring, etc. On completion of each stage, the contractor submits his bills to the architect for certification, who, after verification of the quantities and rates, certifies the value of work done. It is called 'work certified' or 'value of work certified'. This amount is credited to the contract account.

Value of Work Certified	……
Less: Retention Money	……
Total Payment Due	……

PROGRESS PAYMENTS

The payments due to the contractor at each stage of completion, is termed as 'progress payments'. The amount of progress payment due at each stage is calculated as follows:

Less: Payments made to date	……
Progress Payment Due	……

The total amount of progress payment made up to the end of the accounting year is termed as 'cash received'. This stands debited to the Contractee's personal account. It is not shown anywhere in the contract account.

COST OF WORK UNCERTIFIED

It is quite possible that at the end of an accounting year, certain amount of work remains uncertified. For example, the accounting year of a contract ends on 31st March, 1991. The work done up to 15th February, 1991 having reached a stipulated stage, had been duly certified. Apparently, the work done from 16th February to 31st March, 1991 remains uncertified. The costs incurred in relation to the contract during this period of six weeks shall be ascertained and shown as 'cost of work uncertified'. It is like closing stock of finished goods. Hence, it is credited to contract account at the end of the accounting year and then debited to the contract account at the beginning of the next accounting year.

EXTRAS

Sometimes, the contractor may be asked to do some work which is not included in the original contract. This becomes necessary on account of some additions/alterations which are suggested later on. The contractor is usually entitled to charge extra amount for such work. This amount is called 'extras'. These charges are treated as income for the contractor and is credited to the contract account in his books.

14.3 PROFIT OF INCOMPLETE CONTRACTS

If the work on a contract is started and finished during the same accounting year, its profit or loss can be easily calculated and transferred to Profit and. I.ess Account. But, in case of contracts which extend to more than one accounting year, the question arises whether any profit or loss should be accounted for during the accounting year or years when they are still in progress and, if so, how? It is agreed that if profit is computed only on the competition of the contract, there will be heavy fluctuation in the amount of profit from year to year. This will result not only in distorted profit pattern but also higher tax liability during the year of completion of the contract because the tax will have to be paid at higher rates. At

the same time, if profit is computed on the uncompleted contracts and taken to Profit and Loss Account, there is a possibility of other unforeseen contingencies. Hence, it is an accepted principle that profit on uncompleted contracts must be taken into account in respect of the work certified only after providing adequate reserve for future contingencies. This is usually based on the formula:

$$2/3 \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

However, after ascertaining the profit in respect of the work certified (called notional profit), the amount to be taken to Profit and Loss Account is determined on the basis of the following rules:

1) In case the work on the contract has not reasonably advanced, say, the value of work certified is less than one-fourth of the contract price, the whole amount of the notional profit should be kept in reserve. In other words, in such a situation, no profit should be taken to Profit and Loss Account.

2) In case the work on the contract has reasonably advanced, say, up to one-fourth of the contract, then

a) If the value of work certified is one-fourth or more but less than half of the contract price, the amount of profit to be taken to Profit, and Loss Account is determined as follows:

$$1/3 \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

b) If the value of work certified is half or more than half of the contract price, the Job and Contract Cost it amount of profit to be taken to Profit and Loss Account is determined as follows:

$$2/3 \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

Illustration 01:

The total contract price in respect of a contract was Rs. 5, 00,000. On 31st March, 2018, the of work certified was Rs. 3, 00,000, and the cost of work certified (total cost incurred date minus cost of work uncertified) was Rs. 2, 55,000. The cash received was Rs. 2, 40,000.

You are required to determine the amount of profit to be taken to the Profit and Loss Account for the year ending 31st March, 2018.

Solution 01:

Value of Work Certified	3,00,000
Less: Cost of Work Certified	2,55,000
Notional Profit	45,000
Profit taken to Profit and Loss Account	

$$2/3 \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}} = 2/3 * 45000 * \frac{240000}{300000} = \text{Rs.}24000$$

3) In case the work on the contract is nearing completion, the basis of taking profit to Profit and Loss Account is the total estimated profit on complete contract, and not the notional profit. Hence, you will have to work out first the total profit expected on the complete contract. For this purpose, further expenditure to be incurred on the remaining part of the contract is estimated and added to the costs incurred to date so as to arrive at the total cost, on the contract. By deducting this amount from the contract price, you will arrive at the total estimated profit. Thus

Total Estimated Profit = Contract Price - (Expenditure incurred to date + Additional Expenditure)

Having arrived at the total estimated profit as per the above equation, the profit to be taken to the Profit and Loss Account is determined as follows:

$$\textit{Total Estimated profit} \times \frac{\textit{Work Certified}}{\textit{Contract Price}} \times \frac{\textit{Cash Received}}{\textit{Work Certified}}$$

Alternatively

$$\textit{Total estimated profit} \times \frac{\textit{Work Certified}}{\textit{Contract Price}}$$

The alternative formula may be used if the amount of cash received cannot be ascertained.

Illustration 02: The Contract price in respect of a project was Rs.5, 00,000. On 31st March, 2018, 90% of the work had been completed and certified by the architects. The costs incurred up to 31st 2018 on this project amounted to Rs.4, 00,000. It was estimated that another Rs. 20,000 would have to be spent further to

complete the project. The contractee paid 80% of the value of work certified:

Complete the profit to be taken to Profit and Loss Account for the year ending 31st March, 2018.

Solution 02:

Contract Price		5,00,000
Less: Total Estimated cost		
Cost to date	4,00,000	
Costs to be incurred	20,000	4,20,000
Total Estimated Profit		80,000

Profit to be taken to Profit & Loss Account

Total estimated profit × *Work Certified* × *Cash Received*

Contract Price *Work Certified*

= 80000* 450000 * 360000 = 57600

500000 450000

Working Note

Cash received being 80% of the work certified is

= 80% of 450000 = 360000

Illustration 03:

On 3rd January, 2018 Beas construction Ltd. started work on the construction of an office block at a contracted price of Rs.7, 50,000. The construction company's financial year ended on 31st October, 2018 and on that date the accounts pertaining to the contract contained the following balances:

Materials issued to site	1,61,000
Materials returned from Supervisory Staff Direct site	14,000
Wages paid	68,000
Own Plant in use on site (at Cost)	96,000
Hire of Plant and Scaffolding	72,000
Supervisory Direct	11,000
Indirect	12,000
Head office Charges allocated to the contract	63,000
Value of Work Certified to 31.10.2018	4,00,000
Cost of Work Completed but not yet Certified	40,000
Cash Received on Work Certified	3,30,000

Depreciation on own plant is to be provided at the rate of 12½% per annum

on cost; Rs. 2,000 is owning for wages: Estimated value of materials on site Rs. 24,000. You are required to prepare the Contract Account for the period ended 31st October, 2018 showing the amount to be included in the construction company's Profit and Loss Account.

Solution 03:

Beas Construction Ltd.

Contract Account for the Year ending 31-10-2018

Dr.			Cr
	Rs.		Rs.
To Materials issued	1,61,000	By Materials returned	14,000
To Wages paid	68,000	By Plant on hand (Depreciation value)	86,000
To Plant at cost	96,000	By Materials on site	24,000
To Plant Hire	72,000	By Cost of Work-in-progress c/d	3,61,000
To Supervision: Direct	11,000		
Indirect	12,000		
To Head Office Charges	63,000		
To Wages	2,000		
	4,85,000		4,85,000
To Cost of Work-in-progress b/d	3,61,000	By Value of Work Certified	4,00,000
		By Cost of Work Uncertified c/d	40,000
To Notional Profit P & L A/c 43,450 Reserve 35,550	79,000		
	4,40,000		4,40,000

Working **Notes**

1) Depreciated value of plant on hand Rs.

Plant at cost	96,000
Less: Dep. at 12 for 10 months	10,000
Depreciated value	86,000

2) Profit to be credited to Profit & Loss Account

$= \frac{2}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$

$= \frac{79,000}{4,00,000} \times \frac{2}{3} \times 3,30,000 = \text{Rs. } 43,450$

14.4 CONTRACTEE'S ACCOUNT

Contractee's Account is a personal account of the contractee. This account is credited as and when the cash is received from the contractee. No amount is debited to this account till the contract is completed. Thus, it will continue to show a credit balance so long as the work on the contract is in progress. Since the amount is received from the contractee against the value of work certified, the balance in his account is not treated as a liability and, therefore, it should not be shown on the liabilities side of the Balance Sheet. The common practice is to deduct it from the work-in-progress shown on the assets side of the Balance Sheet.

14.5 WORK IN PROGRESS

In Contract Account you must have noted that all costs incurred on the uncompleted contract are shown as the cost of work-in-progress. The cost of work-in-progress consists of the cost of work certified, as well as the cost of work uncertified. Hence, if you have to work out the cost of work certified, deduct the cost of work uncertified from the total cost of work-in-progress. While showing it in the Balance Sheet, however, the profit transferred to Profit and Loss Account is also added thereto. Thus, it will include: a) the cost of work certified, b) the cost of work uncertified, and c) the profit taken to Profit and Loss Account.

You have also learnt that the credit balance in the Contractee's Account (being cash received) is deducted from the work-in-progress shown in the Balance Sheet. Thus, the work-in-progress is shown on the assets side of the Balance Sheet in one of the following two ways:

Work-in-progress	Rs.
Cost of Work Certified	…….
Cost of Work Uncertified	…….
Cost to date	…….
Add: Profit taken to P & L A/c	……..
Less: Cash received	……..

Alternatively

Alternatively	……..
Work-in-progress	
Value of Work Certified	……..

Cost of Work Uncertified ……..
Less: Reserve
Less: Cash Received ……..

If we were to show work-in-progress in the Balance Sheet of Beas Construction Ltd. as per data given in Illustration 3, it will appear as follows:

Work-in-progress

Cost to date	3,61,000
Add: Profit taken to P & I A/c	43,450
Less: Cash received	4,04,450
	3,30,000
Alternatively	74,450

Work-in-progress	Rs.
Value of work certified	4,40,000
Cost of work uncertified	40,000
	4,40,000
Less: Reserve	35,550
	4,04,450
Less: Cash received	3,30,000
	74,450

The second alternative is most commonly used by the accountants. It should be noted that while showing work-in-progress, there is no need to make any adjustment for loss taken to Profit and Loss Account when second alternative is used.

14.6 ILLUSTRATIONS

Illustration 04:

Alcon Construction Co. Ltd., commenced its business on 1st January, 2018. The following data has been extracted from its books in relation to a contract.

	Rs.
Cash received from Contractee	1,20,000
Materials	40,000
Direct labour	55,000
Expenses at site	2,000
Plant& Equipments (at cost)	30,000
Fuel and Power	2,500

The contract price was Rs. 3, 00,000 and the work certified Rs. 1, 50,000. The work completed, since certification had been estimated at Rs. 1,000 (at cost).

Machinery costing Rs. 2,000 was returned to stores at the end of the year. Stock of materials at site on 31-12-2018 was worth Rs. 5,000 and wages outstanding were Rs. 200. Depreciation on Machinery was to be charged at 10%. You are required to calculate the profit on the contract and show how the work-in-progress will appear in the 'Balance Sheet as on 31.12.2018. Also prepare the Contractee's Account.

Solution 04:

Alcon Construction Company Ltd.
Contract Account 2018

Dr. **Cr.**

	Rs.		Rs.
To Materials	40,000	By Materials at site	5,000
To Direct Labour	55,000	By Machinery at site 25,200	
		at stores 1,800	27,000
To Expenses at site	2,000	By Value of work certified	1,50,000
To Fuel & Power	2,500	By Cost of work uncertified	1,000
To Machinery at site	30,000		
To Notional Profit c/d	53,300		
	1,83,000		1,83,000
To Profit & Loss A/c	28,427	By Notional Profits b/d	53,300
To Balance c/d (Reserve)	24,873		
	53,300		53,300

Workings: Profit taken to Profit & Loss Account
= Notional Profit × 2/3 × Cash Received/ Work Certified
= 53000 * 2/3 * 120000/150000 = Rs.28427

Balance sheet as on 31.12.2018 (Extracts)

Assets	Rs.
Work-in-progress	
Work certified	1,50,000
Work Uncertified	1,000
	1,51,000
Less: Reserve	24,873
	1,26,127
Less: Cash received from Contractee	1,20,000
	6,127

Contractee's Account

Dr.			Cr.
To Balance c/d	Rs. 1,20,000	By Bank	Rs. 1,20,000
		By Balance b/d	1,20.000

Illustration 05:
The following particulars relate to a contract for Rs. 40 lakhs:

	2016 Rs.	2017 Rs.	2018 Rs.
Materials	4,50,000	7,00,000	6,00,000
Wages	4,30,000	6,00,000	5,00,000
Expenses	20,000	50,000	16,000
Carriage	20,000	60,000	50,000
Work Certified	9,00,000	30,00,000	40,00,000
Work Uncertified	10,000	50,000	--

Plant costing Rs.1, 00,000 was bought in the beginning of 1988, and depreciation was charged at 25% to per annum. The contractee was to pay 80% of the work certified every year and settle the account in 2018. Draw Contract Account for three years and also write Contractee's Account and Work-in-progress Account in the books of the contractor.

Solution 05:

Contract Account for 2016

Dr.			Cr.
	Rs.		Rs.
To Materials	4,50,000	By Plant on hand (1,00,000-25,000)	75,000
To Wages	4,30,000	By Work certified	9,00,000
To Expenses	20,000	By Work uncertified	10,000
To Carriage	20,000	By P &L A/c (Loss transferred)	35,000
To Plant at cost	1,00,000		
	10,20,000		10,20,000

Contract Account for 2017

To Work-in- progress		By Work Certified	30,00,000
Work Certified	9,00,000		
Work Uncertified	10,000		
	9,10,000	By Work Uncertified	50,000
To Plant on site	75,000	By Plant on hand	
To Materials	7,00,000	(75,000 – 18750)	56,250
To Wages	6,00,000		
To Expenses	50,000		
To Carriage	60,000		
To P &L A/c	3,79,333		
To Balance c/d	3,31,971		
	31,06,250		31,06,250

Contract Account for 2018

To work-in-progress	30,00,000	By Plant on hand (56,250-14,062)	42,188
Work certified	50,000	By Contractee's (contact price)	40,00,000
Work uncertified	30,50,000		
Less: Reserve	3,31,917		
	27,18,083		
To Plant on site	56,250		
To Materials	6,00,000		
To Wages	5,00,000		
To Expenses	16,000		
To Carriage	50,000		
To P& L A/c	1,01,855		
	40,42,188		40,42,188

Contractee's Account

		Rs.			Rs.
2016	To Balance c/d	7,20,000	2016	By Bank	7,20,000
		7,20,000			7,20,000
2017	To Balance c/d	31,20,000	2017	By Balance b/d	7,20,000
				By Bank	24,00,000
		31,20,000			31,20,000

2018	To Contract A/c	40,00,000	2018	By Balance b/d By Bank	31,20,000 8,80,000
		40,00,000			40,00,000

Work-in-Progress Account

		Rs.			Rs.
1988	To Contact A/c	9,10,000	1988	By Balance c/d	9,10,000
		9,10,000			9,10,000
2018	To Balance b/d	9,10,000	2018	By Contract A/c (transfer)	9,10,000
	To Contract A/c	30,50,000		By Contract A/c (reserve)	3,31,917
				By Balance c/d	27,18,083
		39,60,000			39,60,000
2018	To Balance b/d	27,18,083	2018	By Contract A/c (transfer)	27,18,083
		27,18,083			27,18,083

Working Notes

1) Profit taken to P & L A/c in 2018

2/3 * 711250 * 80/100 = 379333 Rs.

2) Depreciation has been charged on the basis of diminishing balance method.

14.8 LET US SUM UP

Contract costing is a special form of job costing used for ascertaining the cost and profit on big projects called contracts. The contract work usually involves huge cost, require long time to complete, and comprises activities outside the factory premises. This applies to most civil engineering jobs like construction of buildings, roads, bridges, etc.

The peculiarity of contract costing lies in ascertaining year-wise cost and profit on projects extending to more than one accounting year. In this regard, the basic principle follows that no profit should be taken on an uncompleted contract unless the work on the project has reasonably advanced. Even then, only a conservative sum may be taken into account

14.9 REVIEW QUESTIONS

Q 1: How does contract costing differ from job costing?

Q 2: Indicate how you would deal with the following items in Contract Account.

a) Plant and machinery specially purchased for a contract

b) Loss of materials stolen or destroyed

c) Sub-contracting

Q 3: State how you would ascertain the actual profit on an incomplete contract. How far such profit is taken to Profit and Loss Account?

Q 4: How is progress payment due at a specific stage computed?

UNIT-15: PROCESS COSTING

LEARNING OBJECTIVES

After studying this unit, you will be able to understand:

- explain Process Costing
- describe difference between job costing and process costing
- discuss the advantages and disadvantages of process costing.

STRUCTURE

15.1 INTRODUCTION

Process costing is a form of operations costing which is used where standardized homogeneous goods are produced. This costing method is used in industries like chemicals, textiles, steel, rubber, sugar, shoes, petrol etc. Process costing is also used in the assembly type of industries also. It is assumed in process costing that the average cost presents the cost per unit. Cost of production during a particular period is divided by the number of units produced during that period to arrive at the cost per unit.

15.2 MEANING AND DEFINITION

Process costing is a method of costing under which all costs are accumulated for each stage of production or process, and the cost per unit of product is ascertained at each stage of production by dividing the cost of each process by the normal output of that process.

DEFINITION

CIMA London defines process costing as "that form of operation costing which applies where standardize goods are produced"

15.3 FEATURES OF PROCESS COSTING

- The production is continuous
- The product is homogeneous
- The process is standardized
- Output of one process become raw material of another process
- The output of the last process is transferred to finished stock
- Costs are collected process-wise
- Both direct and indirect costs are accumulated in each process
- If there is a stock of semi-finished goods, it is expressed in terms of equivalent units
- The total cost of each process is divided by the normal output of that process to find out cost per unit of that process.

15.4 ADVANTAGES AND LIMITATIONS

ADVANTAGES OF PROCESS COSTING:

1. Costs are be computed periodically at the end of a particular period

2. It is simple and involves less clerical work that job costing

3. It is easy to allocate the expenses to processes in order to have accurate costs.

4. Use of standard costing systems in very effective in process costing situations.

5. Process costing helps in preparation of tender, quotations

6. Since cost data is available for each process, operation and department, good managerial control is possible.

LIMITATIONS:

1. Cost obtained at each process is only historical cost and are not very useful for effective control.

2. Process costing is based on average cost method, which is not that suitable for performance analysis, evaluation and managerial control.

3. Work-in-progress is generally done on estimated basis which leads to inaccuracy in total cost calculations.

4. The computation of average cost is more difficult in those cases where more than one type of products is manufactured and a division of the cost element is necessary.

5. Where different products arise in the same process and common costs are prorated to various costs units. Such individual products costs may be taken as only approximation and hence not reliable.

15.5 DISTINCTION BETWEEN JOB AND PROCESS COSTING

Job order costing and process costing are two different systems. Both the systems are used for cost calculation and attachment of cost to each unit completed, but both the systems are suitable in different situations. The basic difference between job costing and process costing are:

	Basis of Distinction	Job order costing	Process costing
1.	Specific order	Performed against specific orders	Production is contentious
2.	Nature	Each job many be different.	Product is homogeneous and standardized.
3.	Cost determination	Cost is determined for each job separately.	Costs are complied for each process for department on time basis i.e. for a given accounting period.
4.	Cost calculations	Cost is complied when a job is completed.	Cost is calculated at the end of the cost period.
5.	Control	Proper control is comparatively difficult as each product unit is different and the production is not continuous.	Proper control is comparatively easier as the production is standardized and is more suitable.
6.	Transfer	There is usually not transfer from one job to another unless there is some surplus work.	The output of one process is transferred to another process as input.
7.	Work-in-Progress	There may or may not be work-in-progress.	There is always some work-in-progress because of continuous production.
8.	Suitability	Suitable to industries where production is intermittent and customer orders can be identified in the value of production.	Suitable, where goods are made for stock and productions is continuous.

15.5 LET US SUM UP

In this unit we have discussed about process costing. Process Costing is a method of costing. The application of process costing is where industries adopting costing procedure for continuous or mass production. It is employed where each similar units or production involved in different series of process from conversion of raw materials into finished output.

15.6 REVIEW QUESTIONS

Q 1: What is process costing? What are its Characteristics?

Q 2: What are the merits and demerits of process costing?

UNIT-16: TREATMENT OF PROCESS LOSSES NAD WASTAGES

LEARNING OBJECTIVES

After studying this unit, you will be able to:

- Know the procedure of costing procedure.
- Understand the treatment of normal loss, abnormal loss and abnormal gain in the process costing.

STRUCTURE

16.1 COSTING PROCEDURE

For each process an individual process account is prepared.

Each process of production is treated as a distinct cost centre.

Items on the Debit side of Process A/c.

Each process account is debited with:

a) Cost of materials used in that process.

b) Cost of labour incurred in that process.

c) Direct expenses incurred in that process.

d) Overheads charged to that process on some pre-determined.

e) Cost of ratification of normal defectives.

f) Cost of abnormal gain (if any arises in that process)

Items on the Credit side:

Each process account is credited with:

a) Scrap value of Normal Loss (if any) occurs in that process.

b) Cost of Abnormal Loss (if any occurs in that process)

Cost of Process:

The cost of the output of the process (Total Cost less Sales value of scrap) is transferred to the next process. The cost of each process is thus made up to cost brought forward from the previous process and net cost of material, labour and overhead added in that process after reducing the sales value of scrap. The net cost of the finished process is transferred to the finished goods account. The net cost is divided by the number of units produced to determine the average cost per unit in that process. Specimen of Process Account when there are normal loss and abnormal losses.

16.2 PROCESS LOSSES

In many process, some loss is inevitable. Certain production techniques are of such a nature that some loss is inherent to the production. Wastages of material, evaporation of material is unavoidable in some process. But sometimes the Losses are also occurring due to negligence of Labourer, poor quality raw material, poor technology etc. These are normally called as avoidable losses. Basically process losses are classified into two categories

(a) Normal Loss (b) Abnormal Loss

NORMAL LOSS:

Normal loss is an unavoidable loss which occurs due to the inherent nature of the materials and production process under normal conditions. It is normally estimated on the basis of past experience of the industry. It may be in the form of normal wastage, normal scrap, normal spoilage, and normal defectiveness. It may occur at any time of the process.

No of units of normal loss: Input x Expected percentage of Normal Loss.

The cost of normal loss is a process. If the normal loss units can be sold as a crap then the sale value is credited with process account. If some rectification is required before the sale of the normal loss, then debit that cost in the process account. After adjusting the normal loss the cost per unit is calculates with the help of the following formula:

Cost of good unit: Total cost increased – Sale Value of Scrap Input – Normal Loss

units

ABNORMAL LOSS:

Any loss caused by unexpected abnormal conditions such as plant breakdown, substandard material, carelessness, accident etc. such losses are in excess of pre-determined normal losses. This loss is basically avoidable. Thus abnormal losses arrive when actual losses are more than expected losses. The units of abnormal losses in calculated as under:

Abnormal Losses = Actual Loss – Normal Loss

The value of abnormal loss is done with the help of following formula:

$$\frac{\textit{Total Cost increase – Scrap Value of normal Loss x Units of abnormal loss}}{\textit{Input units – Normal Loss Units}}$$

Abnormal Process loss should not be allowed to affect the cost of production as it is caused by abnormal (or) unexpected conditions. Such loss representing the cost of materials, labour and overhead charges called abnormal loss account. The sales value of the abnormal loss is credited to Abnormal Loss Account and the balance is written off to costing P & L A/c.

ABNORMAL GAINS:

The margin allowed for normal loss is an estimate (i.e. on the basis of expectation in process industries in normal conditions) and slight differences are bound to occur between the actual output of a process and that anticipates. This difference may be positive or negative. If it is negative it is called ad abnormal Loss and if it is positive it is Abnormal gain i.e. if the actual loss is less than the normal loss then it is called as abnormal gain. The value of the abnormal gain calculated in the similar manner of abnormal loss.

The formula used for abnormal gain is:

Abnormal Gain =

$$\frac{\textit{Total Cost incurred – Scrap Value of Normal Loss x Abnormal Gain Units}}{\textit{Input units – Normal Loss Units}}$$

The sales values of abnormal gain units are transferred to Normal Loss Account since it arrive out of the savings of Normal Loss. The difference is transferred to Costing P & L A/c. as a Real Gain.

SPOILAGE:

Normal Spoilage (i.e. which is inherent in operation) costs are included in costs either by charging the loss due to spoilage to the production order or by charging it to production overhead so that it is spread over all the products. Any value realized from the sale of spoilage is credited to production order or production overhead account as the case may be. The cost of abnormal spoilage is charged to Costing Profit and Loss Account. When spoiled work is the result of rigid specification, the cost of spoiled work is absorbed by good production while the cost of disposal is charged to production overhead.

DEFECTIVES:

Defectives that are considered inherent in the process and are identified as normal can be recovered by using the following method.

- Charged to goods products
- Charged to general overheads
- Charged to departmental overheads

If defectives are abnormal, they are to be debited to Costing Profit and Loss Account.

16.3 ILLUSTRATIONS

SIMPLE PROCESS ACCOUNTS

(A) No losses - No units

Problem 01:

Mr. Ram Kumar produces the product 'Tom' which goes through three direct processes. The following information is available from his accounts.

Items	Process I	Process II	Process III
	Rs.	Rs.	**Rs.**
Direct materials	10,000	6,000	**4,000**
Direct wages	4,000	2,000	**2,000**
Direct expenses	**8,000**	**4,000**	**2,000**

Indirect expenses incurred are Rs.8,000 which are recovered on the basis of 100% of direct wages. You are required to prepare process accounts.

Solution 01: **Process I A/c**

Particulars	Rs.	Particulars	Rs.
To Direct materials	10,000	By Process II A/c	26,000
To Direct wages	4,000	(Output transferred)	
To Directexpenses	8,000		
To Indirect expenses	4,000		
(DW x 100%)			
	26,000		26,000

Process IIA/c

Particulars	Rs.	Particulars	Rs.
To Process I A/c (transfer)	26,000	By Process III A/c	40,000
To Direct materials	6,000	(Output transferred)	
To Direct wages	2,000		
To Direct expenses	4,000		
To Indirect expenses	2,000		
(DE x 100%)	40,000		40,000

Process IIIA/c

Particulars	Rs.	Particulars	Rs.
To Process II A/c (transfer)	40,000	By Finished Stock A/c	
To Direct materials	4,000	(Output transferred)	50,000
To Direct wages	2,000		
To Direct expenses	2,000		
To Indirect exoenses	2,000		
(DW x 100%)	50,000		50,000

(B) Normal loss with scrap value:

Problem 02:

The following expenses were incurred for the production of 1,500 with units of a following product:

Materials	**3,50,000**
Wages	**1,20,000**
Overheads	**80,000**

Normal wastage in the process is 2% of the input and the scrap value is Rs.300 per unit.

You required to prepare process account, assuming there was no abnormal loss or gain.

Solution 02:

Process A/c

Particulars	Units	Rs.	Particulars	Units	Rs.
To Materials	1,500	3,50,000	By Normal loss	30	9,000
To wages		1,20,000	(1,500 x 2% at Rs.300 per unit)		
To overheads		80,000	By Finished stock A/c (Transfer at Rs.368.03 per unit)	1,470	5,41,000
	1,500	5,50,000		1,500	5,50,000

Working Note:

Cost per unit of output = $\frac{\text{Total cost of process} - \text{Scrap value of normal loss}}{\text{Input} - \text{Normal loss (units)}}$

$= \frac{5,\ 50,000 - 9,000}{1,470} = \text{Rs.}368.03$

(C) Normal loss in weight and scrap:

Problem 03:

In a factory, the output of a product passes through two processes P and Q. In each process 5% of the total weight put in is lost and 10% scrap which realise form process P and Q Rs.40 and Rs. 100 per ton respectively.

	P	Q
Material's consumed (in tons)	1,600	112
	Rs.	Rs.

Cost of materials per ton	250	400
Wages	28,800	19,200
Manufacturing expenses	12,000	8,000

Prepare process accounts.

Solution 03:

Process P A/c

Particulars	Tons	Rs.	Particulars	Tones	Rs.
To Material consumed	1,600	4,00,000	By loss in weight (1,600 x 5%)	80	Nil
at Rs.250 per ton		28,000	By Normal scrap	160	6,400
To wages		12,000	(1,600 x 10% at Rs. 40 per ton)		
To Manufacturing exp.			By process Q A/c (transfer at Rs.319.41 per unit)	1,360	4,34,4000
	1,600	4,40,800		1,600	4,40,800

Working Note

Cost per ton of output = $\frac{\text{Total process cost} - \text{Scrap value}}{\text{Input unit} - \text{Weight lost} - \text{Normal scrap}}$

$= \frac{4,40,800-6,400}{1,600-80-160} = \frac{4,34,4000}{1,360} = \text{Rs.}319.41$

Process Q A/c

Particulars	Tons	Rs.	Particulars	Tons	Rs.
To process 'P' A/c (Transfer)	1,360	4,34,4000	By Loss in weight (1,472x5%)	73.60	Nil
To Materials consumed	112	44,800	By Normal scrap	147.20	14,720
(at Rs.400 per ton)			(1,427x10% at		
To Wages		19,200	Rs.100 per ton)		
To Manufacturing			By Finished stock	1,251.20	4,91,680
expenses		8,000	A/c (Transfer at Rs.392.97 per ton)		
	1,472	5,06,4000		1,472	5,06,000

Working Note

Cost per ton of output = $\frac{5,\ 06,400-14,720}{1,472-73.60-147.20} = \frac{4,\ 91,680}{1,251.20}$ = Rs.392.97

ABNORMAL LOSS AND GAIN

(A) Abnormal loss:

Problem 04:

600 kg of a material was charged to process I at the rate of Rs.4/- kg. The direct labour accounted for Rs.200 and the other departmental expenses amounted Rs.760. The normal loss is 10% of input and the net production was 500 kg. Assume that the process scrap is saleable at Rs.2 per kg. Prepare process I account and abnormal loss account.

Solution 04:

Process I A/c:

Particulars	**Kg.**	**Rs.**	**Particulars**	**Kg.**	**Rs.**
To Material @ Rs.4	600	2,400	By Normal loss	60	120
To Direct labour		200	(600 x 10%) @		
To Other expenses		760	Rs.2 per kg		
			By Abnormal loss	40	240
			By Process II A/c (Transferred at Rs.6 per kg)	500	3,000
	600	3,360		600	3,360

(i) Calculation of abnormal loss units

Abnormal loss (units) = Input – Normal loss (units) – Actual output

= 600 – 60 – 500 = 40 units

(ii) Calculation of value of abnormal loss

Value of abnormal loss = Cost per unit of the process output x Units of abnormal loss

Cost per unit of the process output = $\frac{\text{Total cost}-\text{Scrap value}}{\text{Expected output (Input}-\text{Normal loss)}}$

$= \frac{3,360-120}{600-60} = \frac{3,240}{540}$ = Rs.6

Value of abnormal loss = 40 units x Rs.6 = Rs.240

Abnormal loss A/c

Particulars	Kg.	Rs.	Particulars	Kg.	Rs.
To Process 1 A/c	40	240	By Cash A/c (Scrap value at Rs.2 per kg)	40	80
			By Costing P&L A/c (Transfer)	-	160
	40	240		40	240

(B) Abnormal gain:

Problem 05:

The cost records show the following cost of producing 600 units of a product is process X:

	Rs.
Materials	**12,000**
Labour	**4,500**
Overheads	**1,500**

The normal wastage is 10% of the units and this wastage can be sold in the market at Rs.15 per unit. The actual production was 570 units. Prepare process 'X' account, abnormal effectiveness account and normal loss account.

Solution 05:

Process 'X' A/c

Particulars	Units	Rs.	Particulars	Units	Rs.
	600	12,000	By Normal loss A/c	60	900
To Mateials		4,500	(10% of 600 units at		
To Labour		1,500	Rs.15 per unit)		
To Overheads					
To Abnomal effectiveness			By Output (Rs.31.67 per unit)	570	18,050
(Rs.31.67 per unit)	30	950			
	630	18,950		630	18,950

Working Notes

(i) Calculation of abnormal effectiveness in units

Abnormal effectiveness (gain) = Input - Normal loss – Actual = 600 – 60 – 570 = (-) 30 units

(ii) Calculation of value of abnormal effectiveness (gain)

Value of abnormal effective = Cost per unit of output x Units of abnormal effectiveness

Cost per unit of output = $\frac{\text{Total cost}-\text{Scrap value}}{\text{Expected output}} = \frac{18{,}000-900}{600-60}$ = Rs.31.67

Value of abnormal gain = 30 units x 31.67 = Rs.950

Abnormal effectiveness (Gain) A/c

Particulars	Units	Rs.	Particulars	Units	Rs.
To Normal loss A/c (Loss of Scrap income at Rs. 15 per unit)	30	450	By Process A/c	30	950
To Costing P & L A/c (transfer)	-	500			
	30	950		30	950

Normal loss A/c

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process A/c	60	900	By Abnormal effectiveness A/c	30	450
			By Cash A/c (@ Rs.15 unit)	30	450
	60	900		60	900

16.4 LET US SUM UP

It is employed where each similar units or production involved in different series of process from conversion of raw materials into finished output. Thus unit cost is determined on the basis of accumulated costs of each operation or at each stage of manufacturing a product. The application of process costing is where industries adopting costing procedure for continuous or mass production. Textiles, chemical works, cement industries, food processing industries etc.

Again, Process Losses may be defined as the loss of material occurs at different stages of manufacturing process. The following are the types of losses unavoidable during the course of processing operations such as:

• Normal Process Loss

- Abnormal Process Loss
- Abnormal Process Gain
- Spoilage
- Defectives

16.5 REVIEW QUESTIONS

Q 1: Write short notes on:

a) Normal Process Loss

b) Abnormal Process Loss

c) Abnormal Gain.

Q 2. What do you understand by Process Losses?

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