Unit – I
LESSON 1
INTRODUCTION TO COST ACCOUNTANCY

CONTEXT OF THE LESSON

This lesson will familiarize with the different terms and their meaning which are used in the area of cost accountancy. This lesson signifies the objectives and advantages of applying cost accounting techniques and methods within the industry.

OBJECTIVES OF THE LESSON

The objective of this lesson is to know:

1. Meaning and definition of various terms used in cost accounting.
2. Objective of cost accounting.
3. Significance of cost accounting.

INTRODUCTION:

Cost is the amount of resources given up or sacrificed in exchange for some goods/article/product or services. The resources given up are expressed in cash or cash equivalent expressed in monetary units. The Chartered Institute of Management Accountants,(CIMA) London, has defined cost as “the amount of expenditure (actual or notional) incurred on or attributable to a specified thing or activity”. Thus, cost includes the amount which has been actually incurred and for decision making, notional or imputed costs which do not involve cash outlay and hence do not find place in accounting records are also considered (for example rent of the owned building, or salary of the owner working as manager).

DEFINITIONS:

COSTING

“Costing can be defined as “the techniques and process of ascertaining costs” - I.C.M.A

Costing relates to the determination of cost of a product manufactured or services rendered. In order to ascertain cost, it involves system, methods and techniques of costing and a certain process in followed for accumulation, classification and analysis of cost.

The technique refers to application of principles and rules for ascertaining costs. These techniques can be applied for specific purpose. These techniques are- Historical costing technique; Absorption costing technique; Marginal costing technique; Standard costing technique; Direct costing technique; Uniform costing technique etc.

The methods of costing differ from the techniques and the methods of costing are applied as per the nature of the organization. The methods of costing can be classified as-

a) Specific Order Costing Method

b) Continuous Operation costing method

The word “process of ascertaining cost” includes the day to day routine of determining cost through the process related to Allocation, Apportionment and Absorption of costs, besides the presentation of statement of cost, showing how the cost have been arrived at.

Cost Allocation: - Allocation is the process whereby cost items are charged directly to a cost unit or cost centres i.e. a cost can be specifically and exclusively be identified and allocated entirely to a specific department or cost centre.

Cost Apportionment: - Apportionment is the process of division or apportionment of cost among two or more cost centre on some appropriate basis. Those cost which are associated or related with two or more than two cost centres are to be apportioned among these cost centres that have been benefited by these expenditures.

Cost Absorption: - It is a process of ascertaining the charge of indirect cost on per unit of production of goods or services. In other word, the overhead is absorbed by the physical units manufactured or units of services rendered during a period or for specific job.

COST ACCOUNTING

“Cost Accounting is the process of accounting for cost 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 usage 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.”

-ICMA

Cost Accounting is the method of accounting for total cost and per unit cost of product, service, order, process or job. Cost comprises three elements, viz., material, labour and expense. The recording and accounting for all these elements of cost find their treatment in cost accounting. All the cost incurred from the very beginning of manufacturing operation till the final stage of disposal of goods find their recording in cost accounting.

Cost accounting as a tool of management process and evaluates monetary and non-monetary data in order to provide necessary, adequate and reasonable information for effective and efficient planning and control of business operations, managerial decisions and special analysis.

COST CENTRE AND COST UNIT

A cost accountant has to ascertain cost by cost centre or cost unit or by both.

COST CENTRE:

According to the Chartered Institute of Management Accountants London, cost centre means a production or service location, function, activity or items of equipment whose cost may be attributed to cost unit. Cost centre is the smallest organizational sub-unit for which separate cost collection is attempted. Thus, cost centre refers to one of the convenient unit into which the whole factory organization has been appropriately divided for costing purposes. Each such unit consists of a department or a sub-department or item of equipment or, machinery or a person or a group

of persons. For example, although an assembly lines. Sometimes each assembly line is regarded as a separated cost centre with its own assistant foreman. Washing of clothes are performed. Each activity may be considered as a separate cost centre and all costs relating to a particular cost centre might be found out separately.

COST UNIT:

Chartered Institute of Management Accountants London, defines a unit of cost as "a unit of product or service in relation to which costs are ascertained" A cost unit is a device for the purpose of breaking up or separating costs into smaller sub-divisions. These smaller sub-divisions are attributed to products or services to determine product cost or service cost or cost of time spent for a particular job etc.

For instance, cost per ton of steel, per ton kilometer of a transport service or cost per machine hour. The forms of measurement used as cost units are usually the unit of physical measurement like number, weight, area, length, value, time etc. unit selected should be unambiguous, simple and commonly used. Following are some examples of cost unit:

COST ACCOUNTANCY:

INDUSTRY/ PRODUCT	COST UNIT
Automobile	Number
Brick work	1000 brick
Cement	Tonne
Transport	Tonne – kilometer Passenger – kilometer
Chemical	Liter, gallon, kilogram, tonne
Steel	Tonne
Sugar	Tonne

"Cost accountancy is the application of costing and cost accounting principles, methods and techniques to the science, art, and practices of cost and the ascertainment of profitability. It includes the presentation of information derived therefore for the purpose of managerial decision-making."

-ICMA

The term cost accountancy includes (i) costing and (ii) cost accounting. Its purpose is (i) cost-control, and (ii) profitability- ascertainment. It serves as an essential tool of the management for decision-making.

Cost control is the objective of cost accountancy but the application of cost control methods lies in the domain of accounting. The cost control methods are: (i) Budgetary Control, (ii) Standard Costing and (iii) Responsibility Accounting.

The cost control does not necessarily mean cost reduction. If the price of material and labour go up and consequently the operation cost goes up, the cost can be said to be within control even with the increased cost provided there is no abnormal wastage or greater idle capacity or any marked inefficiency, however the cost reduced as a result of application of cost control methods are very much welcome.

Profitability is different from profit making. Profitability is the potentiality to make profit, inherent in the business, or in an enterprise. An enterprise may be capable to yield a profit, but due to non-applicability of cost accounting techniques; it may be earning only a low amount of profit. The ascertainment of profitability is the function or the objective of cost accountancy but the application of methods for its ascertainment is the task of cost accounting.

Self Check Questions

1. Define Costing.
2. Explain the term process in costing.
3. What do you mean by Cost Account?
4. What is Cost Centre & Cost Unit?

OBJECTIVES OF COST ACCOUNTING:

The main objectives of cost accounting can be identified as:

(a) Ascertainment of Cost: The main objective of cost accounting is considered as to determine the cost of the product or article or service. For the purpose of ascertainment of cost of the product or service, various methods of costing and techniques are used under various conditions. Through cost accounting, ascertainment of cost is possible for each unit of production, job, process or department and every stages of production. These costs can be determined on the basis of actual cost but cost is also predetermined for various purposes.

(b) Cost Control and Cost Reduction: One of the primary objectives of cost accounting is to improve profitability by exercising control and reducing cost. Cost control is done by comparing the actual cost of production by the pre-determined cost or standard cost so that the difference between these two can be measured and then analysed according to the reasons for taking corrective action. For this purpose various specialized techniques of control are applied. These are standard costing technique, budgetary control, inventory control etc. Cost reduction on the other hand means permanent reduction of cost through continuous research for improvement in products, methods, procedures and

organizational practices. Cost reduction should be real and permanent – through increase in productivity, change in product design, and improvement in technology.

(c) Managerial Decision Making: Cost accounting is of immense help to the management as it aims at serving the need of the management in conducting the business with utmost efficiency. The cost data accumulated and analysed provides meaningful information to the management to formulate various policy and guidelines for various decisions like make or buy, accept or reject an offer, shut down or continue the business, pricing decisions etc.

(d) Determination of Selling Price: Cost accounting provides the information as regards to cost on the basis of which selling prices of products or services may be fixed. In period of recession, cost accounting helps the management in deciding to what extent the selling price may be reduced to meet the changing situation.

In order to attain these above objectives, it is necessary that there should be an effective system of cost accounting prevailing in the organization which should be re-classified, re-organized and updated according to the need of the management.

SIGNIFICANCE/ IMPORTANCE OF COST ACCOUNTING

The limitations of financial accounting led the management to realize the importance of cost accounting. Any sort of manufacturing business involves expenditure on material, labour, and other items for manufacturing and disposing of product. The management has to avoid the possibility of wastage at each stage. It has to ensure that no machine remains idle, efficient labour gets due incentives, by-product are properly utilized and costs are properly ascertained. Besides the management, the creditors and employees are also benefited in numerous ways by installation of a good costing system. Cost accounting increases the overall productivity of an organization and serves as an important tool for growth and development of business &ultimately bringing prosperity in the counry. Importance of cost accounting can be discussed as follows:

(a) Costing as an Aid to Management: Cost accounting provides detailed costing information to the management to enable them to maintain effective control over stores and inventory, to increase efficiency of the organization and to check wastage and losses. It facilitates delegation of responsibility for important tasks and rating of employees. The management should be capable enough of using the information provided by cost accounts in proper way. The various advantages derived by the management from a good system of costing are as follows:

1. Cost accounting helps in period of trade depression and trade competition- In period of trade depression, the organization cannot afford to have losses hence the management must know the areas where economies may be brought out, wastages can be eliminated and efficiency can be increased. The management should know the actual cost of their products before applying on any scheme of price reduction.

2. Cost accounting aids price fixation- The price of a product to a large extent is affected by the law of supply and demand but to a great extent the cost of article to the producer does play an important role. The producer can take necessary measures and guidance from his costing record while fixing the price of his product or service.

3. Cost accounting helps in making estimates- Proper costing records provide a reliable basis for making estimates and quoting tenders.
4. Cost accounting helps in channelizing production on right lines- Adequate costing information helps the management to distinguish between profitable and non profitable activities. Profit can be maximized by selecting profitable activities and eliminating non-profitable activities.
5. Cost accounting helps in eliminating wastages- As cost accounting provides a detailed break-up of costs at various stages and as direct and indirect cost, it thus facilitate to check various forms of wastages and help the management in formulation of future course of action so that the wastages can be eliminated and production can be improved by application of improved technology, quality material, efficiency of labour etc.
6. Cost accounting facilitates comparisons - Maintenance of past years costing records, records of various products etc. helps the management in comparison which in turn helps the management in formulation of future policies.
7. Cost accounting provides data for periodical profit and loss account- Adequate costing records provide the management with such data as may be necessary for preparation of profit and loss account and balance sheet at such intervals as may be desired by the management.
8. Cost accounting helps in determining and enhancement efficiency-Llosses due to wastages of material, idle time of workers, poor supervision, etc., will be disclosed if the various operations involved in the production are studied carefully. Efficiency can be measured, costs controlled and various steps can be taken to increase the efficiency.
9. Cost accounting helps in inventory control- cost accounting furnishes control which management requires in respect of stock of material, work in progress and finished goods.

(b) Costing as an Aid to Creditors- Investors, bank and other financial institutions have a stake in the success of the business concern and are, therefore benefited immensely by the installation of an efficient system of costing. They can base their judgment about the profitability and future prospects of the enterprise on the costing records.

(c) Costing as an Aid to Employees- Employees has a vital interest in their employer's enterprise in which they are employed. They are benefited by a number of ways by the installation of an efficient system of costing. They are benefited, through continuous employment and higher remuneration by the way of incentives bonus plans, etc.

(d) Costing as an Aid to National Economy- An efficient system of costing brings prosperity to the business enterprise in turn result in stepping up of the government revenue. The overall economies development of a country takes place as a consequence increase in efficiency of production. Control of costs, elimination of wastages and inefficiencies led to the progress of the industry and, in consequences of the nation as a whole.

(e) Costing as an Aid to Consumer: - Cost accounting system provides cost control which leeds to reduction in cost of product and services. These help the organization to offer product and services to the consumer at lower price and of good quality.

(f) Costing as an Aid to Government: - This system is useful for government for deciding the state subsidy to industry and also for economic planning and development by the state. The government requires various details of cost in formulating various economic policies such as tax policy, business policy, export policy, etc.

(g) Costing as an Aid to Investors: - The banks and other investors also find it useful to make investment in the companies which employ costing methods because it helps in determining worthiness of credit being granted to them.

SELF CHECK QUESTION: -

1. Define costing and explain the terms process and techniques used in the definition?
2. Differentiate between cost and costing?
3. What is meant by cost accounting, explain its objectives?
4. What is the significance of cost accounting to various stake holders?
5. Define cost accounting and discuss its significance?
6. Explain the term costing, cost accounting and cost accountancy?
7. What do you mean by cost centre and cost unit?
8. What is cost accounting? Discuss briefly its objectives and advantages.
9. “Costing system has become an essential tool in the hands of management.” Discuss.
10. Describe briefly the role of cost accounting in a manufacturing organization?

LESSON 2
METHODS AND TECHNIQUES OF COSTING

CONTEXT OF THE LESSON

This lesson will familiarize with the various methods of costing which are used in the various industries for determination of cost and techniques of costing which is applied for specific purposes. It will also bring out the difference between cost accounting and financial accounting.

OBJECTIVES OF THIS LESSON

The objective of this lesson is to understand:

1. Various methods of costing,
2. Techniques of costing, and
3. Difference between financial accounting and cost accounting.

METHOD OF COSTING

As per latest CIMA terminology, there are two methods of costing i.e., (i) specific order costing and (ii) continuous operating costing. Specific order costing method is a method which is applied in those industries where the production activities are taken on the order or request of the customer. The customer provides the size, specification and quantity to be produced. Hence, in the industry where these methods are applied, production is not done for stock. Continuous operating costing method is applied in those industries where production in carried out on a large scale, on a continuous basis and goods produced are either sold off or kept in stock. The various costing methods are as follows:

(a) JOB COSTING: It refers to a method of costing, in which costs are ascertained in terms of specific jobs or order, which are not comparable with each other. The cost is accumulated for specific job. The job is generally for a short duration and are carried out within the factory premises. Industries where this method of costing is generally applied are printing press, automobile garage, repair shop, ship building, house building, engine and machine construction, etc.

(b) CONTRACT COSTING: Contract costing does not differ in principle from job costing. This method is applied where production or work is taken on the request of the customer. For each contract, a separate contract account is prepared. The contracts undertaken may involve more than one year for its completion, hence profits on incomplete contracts are determined. As contracts can be carried over for a longer period of time, hence, this method is also termed as terminal costing. Works on contracts are generally carried out at different sites, outside the business premises.

(c) BATCH COSTING: This method is also a type of job costing. A batch of similar products is regarded as one job and the cost of this complete batch is ascertained. It is used to determine the unit cost of the articles produced. It should, however, be noted that the article produced should not lose their identity in manufacturing operations.

(d) OPERATION COSTING: This method is adopted when it is desired to ascertain the cost of carrying out an operation in a department, for example, welding. For large undertaking, it is frequently necessary to ascertain the cost of various operations.

(e) PROCESS COSTING: This method of costing is applied in those industries where a product passes through distinct stages or processes and the output of one process becomes the input of the subsequent process, till it reaches the final process. The output of the last process is thereafter transferred to warehouse for sale or is kept as stock. The cost of each stage or process of production is determined by preparing separate process accounts. Process costing is generally adopted in textile industries, chemical industries, etc.

(f) UNIT OR SINGLE OR OUTPUT OR SINGLE-OUTPUT COSTING: This method is used where a single article is produced or services are rendered by continuous manufacturing activity. The cost of whole production-cycle is ascertained as a process and the cost per unit is arrived at by dividing the total cost by the number of units produced. The unit of costing is chosen according to the nature of product. Cost statement or cost sheets are prepared, under which, various items of expenses are classified and total expenditure is divided by total quantity produced in order to arrive at unit cost of production.

(g) OPERATING COSTING: This method is applicable where services are rendered rather than goods produced. The procedure is same as in the case of single output costing. The total expenses of the operation are divided by the units and cost per unit of services is arrived at. This method is employed in railways, road transport, water supply undertaking, telephone services, etc.

(h) MULTIPLE OR COMPOSITE COSTING: Some products are so complex that no single system of costing is applicable. It is used where there are a variety of components separately produced and subsequently assembled in a complex production. Total cost is ascertained by computing component costs, which are collected by job or process costing and then, aggregating the cost through use of the single or output costing system. This method is applicable to manufacturing concern producing motor cars, aeroplanes, machine tools, etc.

(i) UNIFORM COSTING: It is not distinct method of costing by itself. It is the name given to a common system of costing, followed by a number of firms in the same industry. This helps in comparing performance of one firm, with that of another.

(j) DEPARTMENTAL COSTING: When costs are ascertained, department by department, the method is called “Departmental costing.” Usually, for ascertaining the cost of various goods or services produced by a department, the total costs will have to be analyzed, say, by the use of job costing or unit costing.

Self Check Questions

1. What are the various methods of costing?
2. Explain Process costing.
3. How does job costing differ from contract costing?

TECHNIQUES OF COSTING

HISTORICAL (OR CONVENTIONAL) COSTING: It refers to the determination of costs after they have been actually incurred. It means that cost of a product can be calculated only after its production. In this case, only past cost data’s are taken into consideration, as such, it is termed as historical costing. This system is useful only for determining costs, but not useful in exercising

any control over costs. It can serve as guidance for future production, only when condition continues to be the same in future.

STANDARD COSTING: It refers to the preparation of standard cost and applying them to actual cost to measure the variation from standard cost and analyzing the variation with a view to maintain maximum efficiency in production. The actual cost is compared with the pre-determined costs and deviations known as variances are identified. Thereafter, the reasons for the variances are ascertained, so that corrective actions may be taken.

MARGINAL COSTING: It refers to the ascertainment of marginal costs by differentiating between fixed costs and variable costs. Marginal costing regards only variable cost as the cost of the product and is charged to product or operations while fixed costs are charged to profit and loss account in which they arise. This technique is used to study the effects on profit of the changes in volume or type of output.

ABSORPTION COSTING: In this method, the cost is not classified into fixed and variable cost and the total costs are charged to the products. It is a contrast to marginal costing technique, and now days it is considered to have a limited scope of use.

UNIFORM COSTING: When a large number of firms under an industry, adopts the same system of costing terminology for various items and processes, then it is said to have followed a system of uniform costing. The costing technique helps to compare the performance of one firm with that of other firms.

DIRECT COSTING: In this method, all direct costs are charged to operations, processes or products leaving all indirect costs to be written off against profits in which they arise.

Cost accounting may be regarded as: a specialized branch of accounting which involves classification, accumulation, assignment and control of costs. The costing terminology of C.I.M.A., London, defines cost accounting as “the establishment of budgets, standard cost and actual costs of operations, processes, activities or products, and the analysis of variances, profitability or the social use of funds.” Wheldon defines cost accounting as “classifying, recording and appropriate allocation of expenditure for determination of cost of products or services and for the presentation of suitably arranged data for the purpose of control and guidance of management.” It is thus, a formal mechanism by means of which cost of products or services are ascertained and controlled.

DIFFERENCE BETWEEN COST ACCOUNTING & FINANCIAL ACCOUNTING

Financial Accounting and Cost Accounting are the constituent part of accounting. They serve different purposes altogether. Both have merits and demerits. Both follow accounting principles. Both pass the entries from the same source of documents. For example, a purchase invoice forms a basis for an entry in purchase account in Financial Accounts and an entry in stores control account in CA. However, there are dissimilarities also. The differences are summarized as below:

	Financial Accounting	**Cost Accounting**

	(1)To record the actual or accrued expenses and income and capital. (2) To know the profit or loss for the accounting period. (3)To know the financial position of the firm. (4) Profit and Loss account (5) Balance Sheet (6) Stock and Assets Register (7) Annual Report (8) Essentially record expenses after they are incurred or due, therefore reports are “post mortem” in nature. They are “retrospective”. (9) Estimations and quotations are not prepared. Deals with past expenses only. So, it is “curative”	(1)To record the normal revenue expenses for ascertaining the cost. (2) To analyse, control and reduce the cost. (3)To help management in decision-making activities. (4) Cost statement and cost sheet. (5)Variance Analysis. (6) Report and Wastage, etc. (7) Quotations and Estimations. (8) Essentially records expenses before they are incurred at pre-determined rates. Therefore reports are “Intelligence report: in nature. They are “ prospective”. (9) Estimations and quotations are prepared. Deals with sciencetifically expected expenses and so it is “preventive”

Self Check Questions

	(10) P and L Account is prepared for an accounting year and balance sheet is on the last date	(10) Cost statement is prepared as and when required by the management. It is prepared product wise and so it can be prepared weekly, monthly, fortnightly, monthly, etc.
	(11) Financial statement is for shareholders, creditors, government etc. so, it is more for external purpose.	(11) Cost Statement is for management decision making activities. So, it is more for internal purpose.
	(12)Financial Accounts have to be maintained by companies, firms, and concern compulsorily as required by the acts.	(12) Cost Accounts are not compulsory for all. They are required to me maintained by those companies for which Cost Accounting record rules apply. It is based on the products for which government order applies.
	(13) Accounts have to be audit every year.	(13) Only those accounts which are subjected to cost audit are to be audited every year.
	(14) Auditor is appointed by the shareholders in the general body meeting.	(14) Auditor is appointed by the directors approved by central government.
	(15) Auditor must be a charted Accountant.	(15) Auditor must be a cost Accountant
	(16) Audit report is open to public and is a not secret document.	(16) Audit report is not open to public and is a secret document.

1. Discuss the various methods of costing?
2. Discuss the various techniques of costing and their significance?
3. List out the various methods of costing and explain their practical applications?
4. State and explain the major difference between cost accounting and financial accounting?
5. What are the methods of costing? Explain their adaptability in different industries?
6. Name at least three industries in which each of the following methods would be suitable:
   (a) Process costing (b) Unit costing
   (c) Operation costing (d) Job costing
7. What method of costing would you recommend for the following industries? Give five reasons.
   (a) Shipbuilding (b) Toy making (c) Oil refinery
   (d) Sugar (e) Radio receivers

LESSON 3

ELEMENT OF COST AND ITS CLASSIFICATION

CONTEXT OF THE LESSON

This lesson deals with the understanding of various elements of cost which form the part of the cost of the product/article or service. It also deals with various classification of cost which are helpful in taking short term and long term decision making.

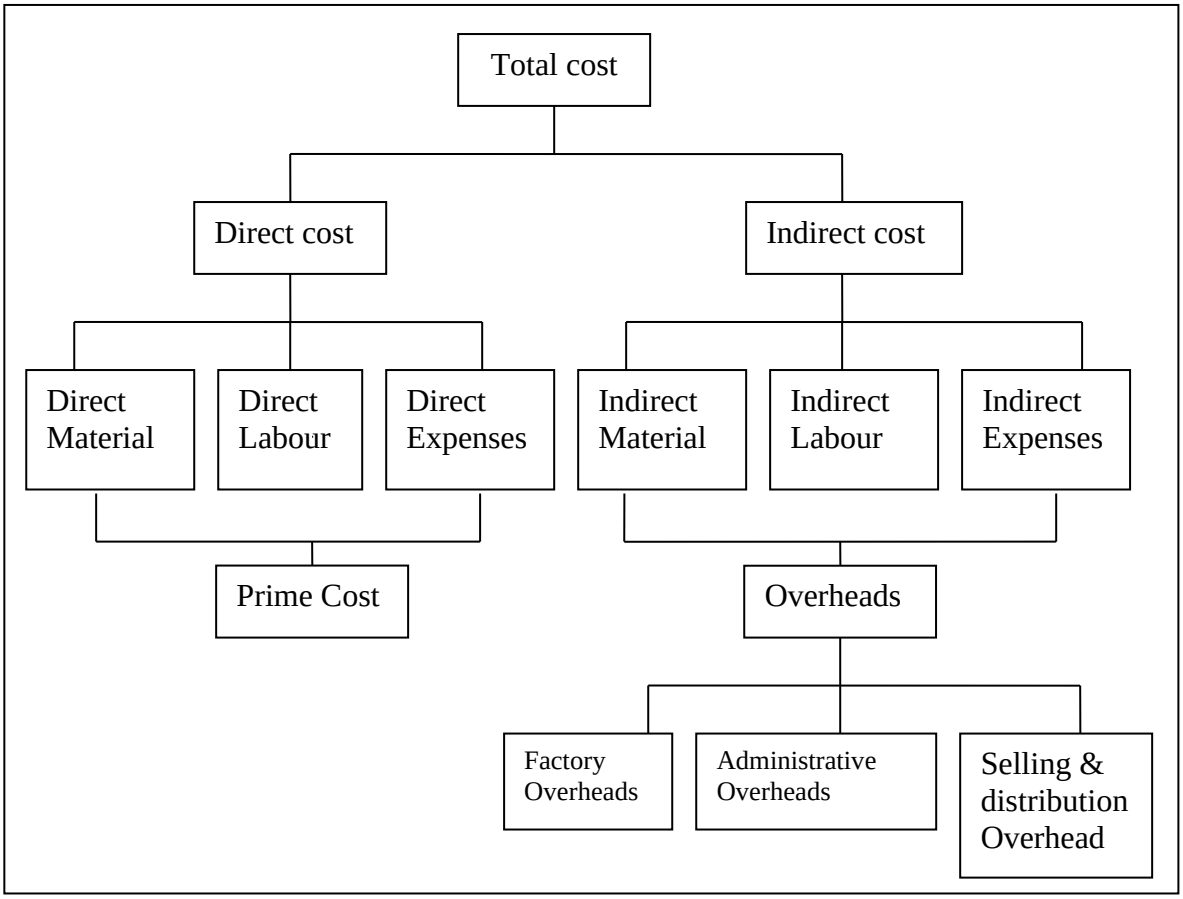
OBJECTIVES OF THE LESSON

- To understand the elements / components of cost
- To familiarize with different types of cost.

ELEMENT OF COST

The cost of a product or service is generally composed of three elements, i.e., material, labour, and expenses. The elements of cost can be broadly studied under the classification of direct and indirect cost. This is shown ahead:-

ELEMENTS OF COST



MATERIAL COST

As per CIMA, London, Material cost is "*the cost of commodities supplied to an undertaking."* Material cost comprises of cost of procurement of raw material, freight, taxes, insurance, etc., which are directly attributable to the procurement or acquisition *of material. Any trade discount,* rebate, duty drawback, refund etc. are deducted in determining the cost of material. Material cost may be further classified as direct material or indirect material cost.

DIRECT MATERIAL COST: Direct material cost can be termed as the cost of that material which can be easily identified and allocated to cost units. Direct material generally becomes a major part of the finished product. For example, timber used in making furniture is a direct material. In certain cases the primary packing materials also becomes a part of the finished product, and hence is treated as direct material. For example match box for keeping match sticks.

Direct Material
- Clay in brick
- Leather in shoe
- Steel in machine
- Cloth in garments

INDIRECT MATERIAL: Indirect materials are those materials which cannot be easily and conveniently identified with individual cost units. These are less significant and play a minor role in making of the product. These materials may be (i) Small and relatively inexpensive items, which may become a part of the finished product. For example, nuts, bolts, screw, threads, etc and (ii) those items which do not physically become a part of the finished products, e.g., coal, lubricant oil and grease, etc.

Indirect Material
- Lubricating
- Sand powder
- Nuts and Bolts
- Small tools

LABOUR COST: This is "*the cost of remuneration (wages, salaries, commission, bonuses, etc.) of the employees of an undertaking*" (CIMA). It includes all fringe benefits like P.F. contribution, gratuity, ESI, overtime, incentive bonus, wages for holidays, idle time.

DIRECT LABOUR: - Direct labour cost consists of wages incurred on employees, who are directly engaged in the process of converting raw material into finished product. These wages can be clearly and conveniently identified with a particular product, job or process. Wages paid to a machine operator is a case of direct wages.

Direct Labour
- Machine operator
- Shoe-maker
- Carpenter
- Tailor

INDIRECT LABOUR: - The indirect labour cost is the cost which is incurred on indirect employees, who are not directly engaged in the process of conversion of shape of raw material into finished product but they assist in the process of supervision, maintenance, transportation, handling, etc. In other words, indirect labour cost should be treated as overhead and should be apportioned to various cost centres or production departments.

Indirect Labour
- Supervisor
- Inspector
- Cleaner
- Peon

EXPENSES

All cost other than material and labour are termed as expenses. It is defined as "the *cost of services provided to an undertaking and the notional cost of the use of* owned *assets."* (CIMA)

DIRECT EXPENSES: - According to CIMA, London "direct *expenses are those expenses which can be identified with and allocated to cost centres or units."* These are those expenses which are specially incurred and charged for a specific or a particular job or cost unit. These are also called as chargeable expenses. For example, cost of drawings, design and layout, hiring charges of a specific plant, fees of a technical expert required on a specific job.

INDIRECT EXPENSES: All indirect costs other than indirect materials indirect labour costs are termed as indirect expenses.

These cannot be directly identified with a particular job,

process or work order and are common to cost units or cost centres.

Indirect Expenses
- Rent and rates
- Advertising
- Insurance
- Repairs

PRIME COST

This is the aggregate of direct material cost, direct labour cost and direct expenses. Thus,

DIRECT MATERIAL + DIRECT LABOUR + DIRECT EXPENSES = PRIME COST.

OVERHEAD

This is the aggregate of indirect material cost, indirect labour cost and indirect expenses. Thus,

INDIRECT MATERIAL+ INDIRECT LABOUR+ INDIRECT EXPENSES = OVERHEAD

Overhead can be classified as follows:

1. **FACTORY/PRODUCTION OVERHEAD:** Also known as manufacturing or works overhead. Factory or works overhead or manufacturing overhead includes cost of indirect material, indirect wages and indirect expenses incurred on production of goods or services.

   (a) Indirect material- Examples: Coal, oil, grease, etc, Stationery in factory office, cotton waste, brush, sweeping broom, etc.

   (b) Indirect labour- Examples: works manager's salary, salary of factory office staff, wages of sweeper, watchmen, etc.

   (c) Indirect expenses- Examples: Factory rent, lighting, heating, insurance, depreciation of plant, repairs of plant, etc.

2. **OFFICE AND ADMINISTRATIVE OVERHEAD:** The administration overhead is the indirect expenditure incurred in general administrative function of the organization, i.e., in formulating policies, planning and controlling the function, directing and motivating the personnel of the organization in the attainment of its objectives.

   This category of overhead can also be, classified into indirect material, indirect labour, and indirect expenses.

   (a) Indirect material- Examples: Stationery and postages used in administrative work.

   (b) Indirect labour- Examples: salary of office staff, salary of managing director, remuneration of director of the company, etc.

   (c) Indirect expenses- Examples: Rent of office building, legal expenses, audit fees, insurance of office, office lighting and power expenses, etc.

3. SELLING AND DISTRIBUTION OVERHEAD: Selling overhead refers to the cost of creating, promoting and stimulating sales demand and retaining customers of the organization. It is defined as "*the cost of seeking to create and stimulate demand & of securing*

orders. Distribution cost includes all expenditure incurred on delivery of goods after the production of product is completed till if reaches its distribution. It is defined as the cost of sequence of operation which begins with making the packed product available to dispatch and ends with making the reconditioned returned empty packages, if any, available for reuse." Examples are carriage outwards, insurance of goods in transit, upkeep of delivery vans, etc.

Selling and distribution overhead are also grouped into indirect material, indirect labour and indirect expenses.

(a) Indirect material- Examples: Packing material, stationary used in sales office, cost of samples, price list, etc.

(b) Indirect labour- Examples: Salary of sales manager, salary of sales office staff, salary of warehouse staff, wages of packers, salary of delivery van drivers etc.

(c) Indirect expenses- Examples: Advertising, travelling expenses, showroom expenses, carriage expenses, running expenses of delivery vehicles etc.

CLASSIFICATION OF COSTS: -

The different bases of costs classification are:

(1) As per time (historical, pre-determined).

(2) As per nature of element (material, labour and overhead).

(3) As per degree of traceability to the product (direct, indirect).

(4) As per association with product (product, period).

(5) Changes in activity or volume(fixed, variable, semi variable)

(6) As per function (manufacturing, administration, selling, research and development, pre-production).

(7) As per relationship with accounting period (capital, revenue).

(8) As per controllability (controllable, non-controllable).

(9) Cost for analytical and decision-making purpose (opportunity, sunk differential, joint, common, imputed, etc).

(10) Others (conversion, traceable, normal, etc.)

CLASSIFICATION ON THE BASIS OF TIME:

(a) **Historical Costs**: - It is the cost which is ascertained after they are incurred. Such costs are available only when the production of a particular thing has already been done.

(b) **Pre- determined Costs**: - These costs are calculated or determined even before they are incurred on the basis of a specification of all factors affecting cost. These may be:

(i) **Estimated costs**: These costs are estimated before goods are produced and are naturally less accurate than standards.

(ii) **Standard cost**: This is a particular concept and technique of costing. This method involves:-

(a) Setting of predetermined standards for each element of cost and each product;

(b) Comparison of actual cost with standard cost.

(c) Determining the causes or reasons of variance and taking remedial action.

BY NATURE OR ELEMENT:

Already discussed earlier in the chapter.

BY DEGREE OF TRACEABILITY TO THE PRODUCTS:

This cost can be distinguished as direct and indirect cost.

Costs which can be easily traceable to a product or some specific activity are called direct cost and can be directly charged to the cost centres. Indirect cost is difficult to trace to a single product and cannot be allocated to a specific job or product but can be apportioned to cost centres or cost units, e.g. salary of a factory manager.

ASSOCIATION WITH THE PRODUCT:

Cost can be classified as product and period costs:

Product cost: Product costs are those which are traceable to the product and included in inventory values. In a manufacturing concern, it includes the cost of direct material, direct labor and factory overheads.

Period cost: Period costs are those cost which tends to be unaffected by changes in the level of production or activity, during a given period of time. These costs are associated with time, such as rent, salaries, etc. This cost includes various administrative cost and selling and distribution cost which are essential for running the business.

BY CHANGES IN ACTIVITY OR VOLUME: Cost can be classified as fixed, variable and semi-variable cost.

Fixed costs: - CIMA, London, defines fixed cost as “the cost which is incurred for a period, and which, within certain output and turnover tends to be unaffected by fluctuation in the levels of activity (output or turnover). Thus, fixed cost remains constant in total regardless of changes in volume up to a certain level of output. However, the fixed cost per unit is variable.

Variable costs:Variable costs are those cost that vary directly and proportionately with the change in level of output e.g. direct material, direct labour. It should be kept in mind that the variable cost per unit is constant but the total cost changes corresponding to the levels of output.

Semi-fixed/ variable costs: - This cost contains an element of fixed and variable costs. As it includes the variable elements, hence, it fluctuates with change in volume and because of the

fixed element; they do not change in direct proportion to output. Semi-variable costs change in the same direction as that of the output, but not in the same proportion.

Functional classification of costs: - A manufacturing firm performs a number of functions. As per function the cost may be classified as follows:

(a) **Manufacturing/ production costs**: - It is the cost of operating the manufacturing department of the business. It includes the cost of direct materials, direct labour, direct expenses and factory expenses.

(b) **Administration costs**: - they are indirect and cover all expenditure incurred in formulating the policy, directing the organization and controlling the operation of a concern.

(c) **Selling and distribution cost**: - selling cost is the cost of seeking to create and stimulate demand. E.g. advertisement, market research, etc. Distribution cost is the expenditure incurred, which begins with making the package produced available for dispatch and ends with making the reconditioned packages available for re-use e.g. warehousing, cartage etc.

(d) **Research and development costs**: - they include the cost of discovering new ideas, processes, and products by examination and experimentations and implementing such results on a commercial basis.

RELATIONSHIP WITH ACCOUNTING PERIOD: On the basis of accounting period, cost can be classified as capital and revenue expenditure. Capital expenditure are those expenditure which involves huge capital outlays and provides benefits in future for a longer period of time. These expenditures are generally incurred on acquiring fixed assets for the business. On the other hand, revenue expenditure are those expenditures which are incurred on a regular basis and benefits only for a short period of time.

CONTROLLABILITY:

On the basis of controllability, cost can be classified as controllable and non- controllable.

Controllable cost: According to CIMA, London, controllable costs are “cost which can be influenced by its budget holders.” Controllable costs are those costs which can be influenced by managerial persons as per his action. All variable costs are generally considered as controllable.

Non controllable cost: -It is the cost which is not subject to control at any level of managerial supervision. The cost which cannot be influenced by a person as per his action is treated as non controllable cost.

COST FOR ANALYTICAL AND DECISION MAKING PROCESS:

(a) **Opportunity cost**: Opportunity cost is the sacrifice involved in accepting an alternative under consideration. In other words, it is a cost that measures the benefit that is lost or sacrificed when the choice of one course of action requires that other alternative course of action be given up.

(b) **Sunk cost**: - A sunk cost is the cost which has already been incurred in past and cannot be changed or avoided by decision taken in the future and over which the management has no controls.

(c) **Differential cost**: - It is the difference in the total cost between alternatives, which is ascertained for the purpose of assisting decision making. Differential cost is the increase or decrease in total costs resulting out of: -

(i) Producing and distributing a few more or few less of products;

(ii) A change in the method of production/distribution.

(iii) An addition or deletion of a product or a territory; and

(iv) The selection of an additional sales channel.

(d) **Joint costs**: - The joint cost relates to a situation in which the factor of production by their basic nature, results in two or more products.

(e) **Common cost**: - Common costs are those costs which are incurred for more than one product, job, or any specific costing object; they are not easily related with individual product and hence are generally apportioned.

(f) **Uniform costs**: These are not distinct cost. Uniform costing signifies common costing principles and procedure adopted by a number of firms.

(g) **Imputed cost**: - This is the cost which is not actually incurred but is only considered while taking decision pertaining to a particular situation. These costs are known as imputed cost.

Others:

(a) **Conversion cost**: Conversion cost is the cost of a finished product or work in progress which mainly comprises of direct labour and manufacturing overhead,

(b) **Normal cost**: - This is the cost which is normally incurred at a given level of output in the condition in which that level of output is achieved.

(c) **Traceable cost**: - This is the cost which can be easily associated with a product, process or department.

(d) **Avoidable cost**: - Avoidable costs are those costs which under the present condition need not have been incurred.

(e) **Unavoidable cost**: - Unavoidable costs are those costs which under the present condition must be incurred.

(f) **Total cost**: - This is the sum of all costs associated to a practically unit, or process, or department or batch or the entire concern.

Self Check Question: -

1- Distinguish between variable, semi variable and fixed cost.

2- State the important ways of classification of cost and discuss each of them in detail.

3- “The classification of costs as controllable and non-controllable depends upon a point of reference” Explain.

4- Enumerate the characteristic of fixed and variable cost.

5- Tabulate the “Element of Cost” showing the usual items of expenditure appertaining to each?

6- What do you mean by element of cost? Give main classes of cost and explain them with the help of diagram?

7- What do you understand by element of cost, explain in detail?

8- Explain the following: - (1) Shut down cost (2) Replacement cost (3) Sunk cost (4) Opportunity cost (5) Imputed costs

UNIT II
LESSON 4

PURCHASE OF MATERIAL

CONTEXT OF THE LESSON

The lesson deals to familiarize with the procedure of purchase of material in the organizations and the various methods for pricing of material issue along with maintenance of stock register which highlights the receipt, issue and carrying inventories.

OBJECTIVES OF THE LESSON

- To discuss the procedure of purchase of material
- To understand the methods of pricing of issued material

Purchasing is the process of acquiring the required raw material, general supplies, spares and tools, office stationary and other items for the production of the product and maintain the business. The key to success lies in efficient purchasing of the material of right quantity, right quality, right time, right place, right source and delivery at the right place. Hence, it is very much essential that there should prevail an efficient system of purchase within the organization.

PURCHASE PROCEDURE

Purchase procedure may differ from organization to organization. The important steps in purchasing and receiving of materials may be as follows, assuming that purchases are centralized:

1. Purchase Requisition:

Purchases of material are initiated through purchase requisitions. A purchase requisition is a formal request by the head of a department or an authorized person to the purchase manager to purchase the specific materials. Purchase requisitions may be prepared by the following persons as per the requirements:

(i) *Storekeeper*: When materials reach ordering level, the storekeeper should purchase procedure initiate.

(ii) *Production Manager*: For some specific material which will be required for the manufacture of a new product.

(iii) *Plant engineer* : Material for repair and maintenance

(iv) *Department heads*: For any material required for his department.

Generally two copies of purchase requisition are prepared. The original copy is sent to the purchasing department and duplicate copy is retained and filed by the requisitioner for his own reference.

2. Selection of the supplier: The purchasing department on receipt of the duly authorized purchase requisition has to select the source of supply. The purchase department generally maintains a list of supplier for each type of materials and selects a particulars supplier after inviting quotations. Emphasis is made to buy the best quality of materials at the lowest possible price after giving due to consideration to delivery dates and other terms and conditions of purchase.

3. Purchase order and follow- up

After the selection of the supplier the next step in the purchase procedure is the preparation of a purchase order. The purchase order is the form used by the purchasing department authorizing the suppliers to supply the specified materials at the price and terms mentioned therein. A purchase order should be carefully prepared as it forms a basis of legal contract between the purchaser and the vendor concerned. Authority to sign purchase orders should also be restricted to selected responsible officials.

4. Receipt of Materials

All the materials supplied by the supplier should be received by the Receiving Department. This department receives the goods or material and verifies their quantities and physical conditions. The quantity is checked against the purchase order copy and their supplier's advice note which is normally received along with the goods.

5. Inspection and Testing of Materials'

Goods received from the supplier should be inspected for quality to ensure that they comply with size and other specifications stated on the purchase order. If any goods need laboratory inspection it is necessary that the goods are passed to a laboratory which will provide a report on the quality of goods.

6. Return of Rejected Materials

Where materials received are damaged or are not in accordance with specifications, these are usually returned to the supplier along with a Debit note, informing the supplier that his account has been debited with the value of material being returned. The supplier signifies his acceptance by the issue of a credit note. The rejected materials may be returned to the supplier immediately or they may be held pending his instruction.

7. Passing invoice for payment

When the invoice is received by the purchasing department the invoices are numbered serially and entered in the invoice Register. The following documents are assembled in support of the invoice: (a) Purchase Order (b) Goods Received Note (c) inspection Report, if not incorporated in the goods, Received Note, (d) Debit or Credit Note. After all documentation work is over and payments are fully authorized by the concerned departments, payments are made to the supplier and receipt is received in this regard.

Pricing of material of Issue

The price at which material issued are to be charged when they are issued to the various production department or cost centre for the purpose of production of the product is one of a difficult problem. There may be certain circumstances when a particular or same type of material may have been purchased in different lots at different dates at several different prices. At the time of issue it may even be possible that a same type of material is being issued to the production department may be priced at different prices on the same day due to the method being adopted for pricing of issued material. This means that actual cost of material issued to the production department may include different prices under the same method of pricing the issue of material.

There are various methods of pricing of issued material which are being used in the various industrial world. These methods can be broadly classified as follows:

1. Cost Price Method	2. Average Price Method	3. Notional Price Methods
(a) Specified Price	(a) Simple Average	(a) Simple Average
(b) First-in First-Out (FIFO)	(b) Weighted Average	(b) Weighted Average
(c) Last-in First-Out (LIFO)	(c) Periodic Simple Average	(c) Periodic Simple Average
(d) Highest- in- First-Out (HIFO)	(d) Moving Simple Average	(d) Moving Simple Average
(e) Base Stock	(e) Moving Weighted Average	(e) Moving weighted Average

(I) **Cost Price Methods**

(a) Specified Price (identifiable) Method

There are certain occasions when the materials are purchased to be utilized particularly for a specific job or issues can be identified with a particular receipt. In these cases, the actual purchase price can be charged. This method can be adopted when prices are stable or when the materials are covered by price control orders. This method has very limited application.

(b) First-in First-Out(FIFO)

This method is based on the assumption that materials which are purchased first are issued first. It uses the price of the first lot of materials purchased until all units from this lot have been issued. In other words the, materials are issued at the oldest cost price listed in the stores ledger account and thus, the materials in stock are valued at the price latest purchased. It should be noted that this assumption of FIFO is only used for accounting purpose i.e., the physical flow of materials need not necessarily be in the order of the flow of cost; though normally materials would be expected to move out of stock on approximately a FIFO basis because oldest stocks are usually consumed up first.

Advantages:

(I) It is good inventory management system since the oldest units are used first and inventory consists of the stock.

(II) It is logical and easy to understand and operate.

(III) It facilitates inter-firm and intra-firm comparisons.

(IV) This method provides a realistic cost of finished goods.

Disadvantage:

(I) The cost of production is not related to the current prices.

(II) If prices are increasing, production cost is understated.

(III) It does not present the true picture when many lots are purchased at different prices. The calculation becomes complicated.

(IV) The pricing of material returns is difficult.

(V) High inflation creates problems in replacing used materials, this aspects is not dealt with in FIFO.

(VI) Usually more that one price has to be adopted for a particular issue.

(VII) Cost comparisons between two batches of production become difficult when issues are priced differently.

Illustration: 1 Following data is available with respect to material M1 for the month of July 2008. Opening stock 300 units @ 26 per unit.

Purchase:

Date	Units	Rate
04/07/2008	700	24
09/07/2008	800	22
16/07/2008	600	20
27/07/2008	800	19

Issues:

Date	Units
05/07/2008	600
08/07/2008	200
15/07/2008	500
26/07/2008	800
31/07/2008	700

Prepare a stores ledger Account under FIFO method

Solution: -

Stores Ledger Accounts

FIFO Method

Date	Receipts			Issue			Balance		
	Qnty	Rate	Amt.	Qnty	Rate	Amt.	Qnty	Rate	Amt.
1/7/08	-	-	-	-	-	-	300	26	7,800
4/7/08	700	24	16,800	-	-	-	300	26	7,800
							700	24	16,800
5/7/08	-	-	-	300	26	7,800			
				300	24	7,200	400	24	9,600
8/7/08	-	-	-	200	24	4,800	200	24	4,800
9/7/08	800	22	17,600	-	-	-	200	24	4,800
							800	22	17,600
15/7/08	-	-	-	200	24	4,800			
				300	22	6,600	500	22	11,000
16/7/08	600	20	12,000	-	-	-	500	22	11,000
							600	20	12,000
26/7/08	-	-	-	500	22	11,000			
				300	20	6,000	300	20	6,000
27/7/08	800	19	15,200	-	-	-	300	20	6,000
							800	19	15,200
31/7/08	-	-	-	300	20	6,000			
				400	19	7,600	400	19	7,600
TOTAL	2,900		61,600	2,800		61,800	400		7,600

Illustration: 2 Following particulars are available with respect to the material M4 for the month of June 2008.Opening stock balance 800 Kgs at Rs. 12 per Kg Stock verifier reported a shortage of 10 kg on 29th June 2008 and surplus of 20 kgs on 25th June 2008.

2008 June	Particular
2	Purchase 1000 kgs at Rs. 14
8	Issued 700 kgs to production.
14	Purchase 900 kgs at Rs. 12.
17	Returned 50 kg to vendor purchased on 14/6/2008
21	Issued 1000 kgs to production.
23	Returned from production dept.40 kgs
28	Purchase 500 kgs at Rs. 13.
30	Issued 800 kgs to production.

Prepare a stores ledger accounts under FIFO method and ascertain (i) cost of material issued during the month & (ii) closing stock on 30/06/2008

Solution: **Stores Ledger Accounts**

FIFO Method

Date	Receipts			Issue			Balance		
June08	**Qnty**	**Rate**	**Amt.**	**Qnty**	**Rate**	**Amt.**	**Qnty**	**Rate**	**Amt.**
1	-	-	-	-	-	-	800	12	9,600
2	1000	14	14,000	-	-	-	800	12	9,600
							1000	14	14,000
8	-	-	-	700	12	8,400	100	12	1,200
							1000	14	14,000
	900	12	10,800	-	-	-	100	12	1,200
14							1000	14	14,000
							900	12	10,800
	-	-	-	Return			100	12	1,200
17				50	12	600	1000	14	14,000
							850	12	10,200
				100	12	1,200	100	14	1,400
21				900	14	12,600	850	12	10,200
							140	14	1,960
	Return						850	12	10,200
23	40	14	560	-	-	-			
							140	14	1,960
	Surplus						850	12	10,200
25	20	14	280	-	-	-	20	14	280
							140	14	1,960
				-	-	-	850	12	10,200
28	500	13	6,500				20	14	280
							500	13	6,500

				Shortage	14	140	130	14	1,820
29	-	-	-	10			850	12	10,200
							20	14	280
							500	13	6,500
				130	14	1,820	180	12	2,160
30	-	-	-	670	12	8,040	20	14	280
							500	13	6,500
TOTAL				2,560		32,800	700		8,940

(c)Last-in-First-out (LIFO) Method

The principle adopted in this method is that the material used in production is from the latest purchase. The inventory is priced at the oldest costs. As the method applies the current cost of material to the cost of units. It is also known as the replacement cost method. It is the most significance method in matching cost with revenue in the income determination procedure.

Advantages:

(I) It is simple and commonly used by the industry in practice for reaping the tax benefits.

(II) It is a systematic method. It matches current costs with current revenues in a better ways.

(III) It reveals real income in times of rising prices.\

Disadvantages

(I) In case of high fluctuation in the rates of material, the method becomes complicated

(II) More than one price may have to be taken into consideration for an issue.

(III) Due to variation in cost inter-firm and intra-firm comparison becomes difficult.

(IV) The stocks require to be adjusted during falling prices.

Illustration: 3 Popline Company uses a raw material called pop for its production purpose. The details are as below:

July 2008	Particular
1	Opening balance 300 liters @ Rs. 25.00 per liter
3	Purchase 500 liters @ Rs. 26.60 per liter.
4	Issued 220 liters.
10	Issued 440 liters
20	Purchase 490 liters @ Rs. 23.00 per liter.
25	Issued 300 liters
26	Surplus of 20 liters returned to stores out of issue on July 4th

Prepare a stores ledger Accounts under LIFO method

Solution: **Stores Ledger Accounts** (**LIFO Method)**

Date	Receipts			Issue			Balance		
July08	Qnty	Rate	Amt.	Qnty	Rate	Amt.	Qnty	Rate	Amt.
1	-	-	-	-	-	-	300	25	7,500
3	500	26.6	13,300	-	-	-	300	25	7,500
							500	26.6	13,300
4	-	-	-	220	26.6	5,852	300	25	7,500
							280	26.6	7,448
10	-	-	-	280	26.6	7,448			
				160	25	4,000	140	25	3,500
20	490	23	11,270	-	-	-	140	25	3,500
							490	23	11,270
25	-	-	-	300	23	6,900	140	25	3,500
							190	23	4,370
26	20	26.6	532	-	-	-	140	25	3,500
							190	23	4,370
							20	26.6	532

(d) Highest-in-first-out

In this method the costliest material is issued first, inventory is valued at the lowest possible price. It is mainly used for monopoly products or cost plus contacts.

(f) Base stock method

March 2008	Particular
1	Opening balance 1100 units @ Rs. 60.00 per unit
3	Issued 140 units
4	Issued 250 units
8	Issued 210 units
13	Received from vendor 400 units at Rs.59 per unit
14	Refund of surplus from a work order 30 units at Rs. 58 per unit.
16	Issued 350 units
20	Received from vendor 480 units at Rs.62 per unit
24	Issued 608 units
25	Received from vendor 640 units at Rs.60 per unit

26	Issued 524 units
28	Refund of surplus from a work order 24 units issued on 3rd March 2008
31	Received from vendor 150 units at Rs.64 per unit

In base stock method a certain level of minimum stock of a material is always carried and it is priced at the original cost (usually at the lowest purchase price). The portion of the stock above this level is issued and priced under any one of the methods. The disadvantage of this method is that the stock may be under valued and hence the computation of return on capital will not be reliable.

II **Average Price Methods**

(a)Simple Average Method

The simple average is the average of prices ignoring the quantities involved. This method is used when the prices are normally stable and the stock purchased are in equal quantities or the value of stock is very small. It is ascertained by dividing the total rates of material by the number of rates of material. A new average is worked out after every receipt.

Illustration: 4 The following were the receipts and issue of material 'Zed' during March 2008

From the above, write the store ledger account on Simple Average Method.

Solution: -

Stores Ledger Accounts

Date	**Receipts**			**Issue**			**Balance**		
March	**Qnty**	**Rate**	**Amt.**	**Qnty**	**Rate**	**Amt.**	**Qnty**	**Rate**	**Amt.**

1	-	-	-	-	-	-	1100	-	66,000
3	-	-	-	140	60	8,400	960	-	57,600
4	-	-	-	250	60	15,000	710	-	42,600
8	-	-	-	210*	60	12,600	500	-	30,000
13	400	59	23,600	-	-	-	900	-	53,600
14	30	58	1,740	-	-	-	930	-	55,340
16	-	-	-	350**	59	20,650	580	-	34,690
20	480	62	29,760	-	-	-	1,060	-	64,450
24	-	-	-	608***	59.75	36,328	452	-	28,122
25	640	60	38,400	-	-	-	1092	-	66,522
26	-	-	-	524****	61	31,964	568	-	34,558
28	24	60	1,440	-	-	-	592	-	35,998
31	150	64	9,600	-	-	-	742	-	45,598

(Simple Average Method)

*** = All issue on 3rd, 4th, and 8th are on Rs. 60** **** 60+59+58/4 = 59**

***** = 60+59+58+62/ 4 = 59.75** ****** = 62+60/ 2 = 61**

(B)Weighted Average Method

For determining the weighted average price the total quantities and total costs are taken into account. After every purchase weighted average price is calculated by adding the quantity received to the stock in hand and the cost is divided by the quantity to arrive at the value. This method avoids price fluctuations and reduces the number of calculation and gives an acceptable figure for stock.

Advantages

(I) It is logical and consistent.
(II) Changes in prices do not affect issues and inventory.
(III) The values reflect actual costs.

Disadvantage

(I) It involves considerable amount of clerical work.
(II) When prices change frequently, it is Unconventional and complex.
(III) As it is not the actual price, it is not realistic.

Illustration: 5 The following purchase has been extended in respect of material “Exe”. Prepare store ledger account under “Weighted average method” of pricing material issue:

Receipts - **Issues:**

Oct.	Particular
3	Purchased 500 units at Rs. 4
4	Purchased 100 units at Rs. 4.20
10	Purchased 50 units at Rs. 4.25
13	Purchased 800 units at Rs. 4.30
23	Purchased 850 units at Rs. 3.80

Oct.	Particular
5	Issued 400 units
10	Issued 50 units
15	Issued 900 units
25	Issued 450 units

Solution:

Stores Ledger Accounts

(Weighted Average Method)

Date	Receipts			Issue			Balance		
Oct.	Qnty	Rate	Amt.	Qnty	Rate	Amt.	Qnty	Rate	Amt.
3	500	4	2,000	-	-	-	500	4	2,000
4	100	4.20	420	-	-	-	600	4.033	2,420
5	-	-	-	400	4.033	1,613	200	4.035	807
10	50	4.25	212.5	-	-	-	250	4.078	1,019.5
10	-	-	-	50	4.078	203.9	200	4.078	815.6
13	800	4.30	3,440	-	-	-	1,000	4.256	4,255.6
15	-	-	-	900	4.256	3,830	100	4.256	425.6
23	850	3.80	3.230	-	-	-	950	3.848	3,655.6
25	-	-	-	450	3.848	1731.6	500	3.848	1,924

Closing inventory 450 units @ 3.815, Rs. 1,732.80

Cost of material consumed, 1800 units valued a Rs. 7,379.70

III Notional Price Methods

(a) Standard Price Method

The price of issue for each item is pre-determined for a stated period taking into accounts all the factors affecting price, e.g., market trends, transportation cost, etc. Standard prices are determined for each material. All issues and inventory are kept at the standard price. This price should be revised from period to period. Standard can be basic or current standard. The basic standard is fixed for long periods and gives the ideal price, it assists forward planning. Current standard keeps costs of the product adjusted to prevailing trends in markets. Basic standard on the other hand to study trends in production cost over a period.

Advantages:

(I) It simplifies accounting as only quantities are recorded.

(II) As only one rate is adopted, inconsistency is avoided.

(III) It helps to determine purchase efficiency If actual cost is more than the standard than there is unfavorable purchasing efficiency and vice-versa.

(IV) It is simple to operate.

(V) It provides stability to the costing system.

Disadvantage

(I) It does not reflect the actual or expected cost but only a target.

(b)Inflated Price Method.

In this method the cost of the material to be issued is inflated by the cost of lost of material. Inflated price includes carrying costs, losses due to evaporation etc. it aims to recover full costs of material purchase.

(c) Replacement Price Method: Material may be issued at the replacement price. The replacement price is the cost of the same type of materials in the market at any given time.

SELF CHECK QUESTIONS

THEORETICAL QUESTIONS

1. Discuss the different methods of pricing the materials issued from stores for production.
2. Discuss the merits & demerits of the following methods of valuation of inventories of issued material.
    - FIFO method
    - Weighted Average
    - Replacement price
3. Explain with examples the following methods of pricing of issue material:
    - FIFO method
    - LIFO method

Under condition of rising prices which of these methods of pricing issues of material is suitable.

Question 1

Prepare a store ledger account from the following transaction adopting the FIFO.

Receipts			Issues	
Date	**Qty.**	**Rate**	**Date**	**Issue**
Dec.			Dec. 4	100
3	200	20.00	10	50
18	300	18.00	20	300
28	50	15.00	30	100

Question 2

From the following particulars prepare “Stores Ledger Account” showing issue of material for the month of December under FIFO method

Receipts			Issues	
Date	**Qty.**	**Rate**	**Date**	**Issue**
Aug.			Aug.	
3	750	2.00	19	850
18	350	2.10	26	450
25	600	2.20	29	510
28	500	2.30	30	150

Question 3

With the help of the following particulars, prepare stores Account showing issue of materials on the basis of LIFO:

March 2008	Particular
1	Opening balance 200 units @ Rs. 2.00 per unit
2	Purchased 600 units @ Rs. 3.00 per unit
6	Issued to production 600 units
12	Purchased 400 units @ Rs. 3.40 per unit
22	Issued 300 units
26	Purchased 500 units @ Rs. 3.50 per unit
30	Issued 200 units

Question 4

From the following information, write the stores ledger account based on Simple Average method of pricing issue:

Receipts				Issues	
Date	**Particular**	**Qty**	**Rate per unit**	**Date**	**Issue**
May				May	
12	Purchase material	400	59.00	3	140
14	Refund of surplus	30	58.00	4	250
20	Purchased	480	62.00	8	210
25	Purchased	640	60.00	16	350
28	Refund of surplus(issue on 3rd may)	24		24	608
31	Received from supplier	150		26	524

Opening stock on 1stMay 2008, 1,100 units @ Rs. 60 per unit.

Question 5

From the following particulars, prepare stores ledger for the month of Jan. 2008, showing material issue process on the Weighted Average Price Method:

Receipts			Issues	
Date	**Qty.**	**Rate**	**Date**	**Issue**
Jan.			Jan.	
1	500	2.00	1	400
10	200	3.00	15	100
18	400	4.00	22	200
27	300	5.00	31	300
29	Return 10 unit issue on 15th Jan.			

2 ton loss was revealed on Jan.28 during stock verification.

Question 6

From the following information prepare Store ledger Account showing issue of material on LIFO method:

October 1	Balance 500 units @ Re, 1.00 per unit.
October 10	Ordered 250 units.
October 18	Issued 125 units.
October 21	Received 150 units @ Rs. 1.10 per unit.
October 25	Ordered 200 units.
November 1	Issued 175 units.
November 10	Received 200 units @1.20 each.
November 20	5 units defective, returned: they were purchased on 21st Oct.
December 1	Received 100 units @ Rs.1.10 each.
December 15	Issued 100 units
December 20	Returned to store 25 units, issued on 15th December.
December 30	Issued 125 units.

Lesson 5

METHODS OF REMUNERATION OF LABOUR

CONTEXT OF THE LESSON

This lesson deals with various types of labour cost and various method adopted for payment of remuneration.

OBJECTIVES OF THE LESSON-

- Classification of labour cost
- Methods of remuneration on various bases.

INTRODUCTION

Labour is considered as one of the important factor of production in an industrial organization. It is the employment of labour which help to convert the raw material into finished products and services. Labour is the only factor which can give almost unlimited productivity-its output can be increased whereas the output from other factors is limited by their physical limitations. However, labour is complex and delicate hence it should be handled very carefully and efficiently and should be remunerated properly.

LABOUR COST

In the narrow sense, the term labour cost encompasses only wages paid to the workers but it represents the various payment made to a worker arising out of his employment in the orgnisation**.**

The total labour cost can be classified as follows:

(a) Direct labour costs;

(b) Indirect labour cost.

DIRECT LABOUR COST

It refers to all expenses which are incurred on labour in altering the construction composition, confirmation or condition of the product. The wages paid to skilled and unskilled workers for his labour can be allocated specifically to the particular product or the process as the case may be. In any manufacturing process or department, the workers employed may be of the following two categories.

(i) Those who are directly engaged on the production or in the carrying out of an operation or process.

(ii) Those who are assisting in the process by way of supervision, maintenance, transportation of material, etc.

The workers who are directly engaged in the production or carrying out the operation process constitute as direct labour and the wages paid to them are termed as direct wages. Direct labour cost is that part of wages and salaries which can be identified with and charged to a single costing unit. It is the cost which can be easily identified and has a direct relationship with the product or process of operation.

INDIRECT LABOUR COST: - It refers to all expenses that are incurred on labour but that does not alter the construction, confirmation, composition or condition of the product, but which contributes or assist generally to such work and help in the completion of the product and handling

up to the point of dispatch. In other words, Labour employed for the purpose of carrying out tasks incidental or ancillary to goods produced or services provided is regarded as indirect labour. Wages or salaries paid to foreman, supervisors, inspectors, clerks, etc, are the example of indirect labour.

Need for distinguishing between direct and indirect labour cost: The distinction has to be made:

(a) For calculating appropriate labour cost and thus provide a basis for strict control;

(b) For facilitating calculation of labour efficiency.;

(c) For proper allocation of overheads;

(d) For introduction of incentive schemes;

(e) For inter-unit comparison; and

(f) For estimating total labour cost.

METHODS OF REMUNERATION

Time rate system:

Time rate or day rate is related to the hours of wage and is commonly used. The wage rate can be fixed on hourly, daily, weekly, monthly basis depending on the nature of his skill. In this method the worker is remunerated for the time which he has devoted or spent within the factory premises irrespective of the work he has done.

This method can be applied where:

(a) Quality of work is of greater significance;

(b) Output of a worker cannot be measured;

(c) Output of a worker is beyond his control;

(d) The work can be closely supervised;

ADVANTAGES

The advantages of this system are:

(a) Easy to understand and simple to calculate;

(b) Widely accepted by trade unions as all workers are paid alike;

(c) Less clerical expenditure is involved;

(d) A steady income is guaranteed

(e) Employees are in no hurry in completing the job as a result, tools and material are handled carefully and wastages are minimized.

DISADVATAGES

(a) It does not motivate or encourage workers to take initiative;

(b) Labour cost may increase thereby decreasing profit. This may be caused by decrease in productivity;

(c) Standard for labour are difficult to set;

(d) Productivity may decrease thereby disturbing the production schedules, creates production bottlenecks and increase cost per units;

(e) Idle time may increase and even lead to inefficiency;

This system can be further classified as:

(a) **High Wage Plan**: - A higher wage rate can be fixed as compared to the wage rate prevailing in the area. This is generally applied to attract efficient workers in order to increase the production. In order to enable the workers to achieve the standard, suitable working environment and conditions are provided. This method is also beneficial to employer as it lead to reduction in overheads.

The advantages of this methods are:

(a) It is simple and economical

(b) Encourages and attract skilled workers for the job

(c) Leads to increase in production

(d) Decrease wages and overhead cost per unit.

(b) Different time rates: - This method is applied were workers have various levels of efficiency and as such different rates are fixed. For the workers whose efficiency is up to the standard level, to them normal wages are paid and for workers having efficiency beyond the standard level, the rate is gradually increased.

(c) Measured day work (Graduated):- In this method the hourly rates are divided into two parts. A certain part of the hourly rate is fixed which generally depends upon the nature of the job and the other part is variable depending on the merit rating and cost of living.

From the above discussion it is clear that this system is very complicated and the calculation involved in this process also increases when the workers change jobs on frequently basis. Merit rating may be arbitrary. There is multiplicity of rates. It is difficult for the workers to easily understand the system.

(d) Payment by results

It is a method of remunerating the workers which in payment mainly depends on the output or units produced by the workers. The workers have an opportunity to earn and increase his income by producing more units.

Piece Rate Method

In this method, the workers are paid on the basis of the quantity produced or output achieved by each worker. It is a very simple and commonly used method of wage payment. The worker is paid on the basis of output produced irrespective of the time taken for production.

The total wages to be paid to the worker is determined on the basis of the following formula:

Wage = Number of units produced during the period X Rate per unit.

The piece rate method is more suitable in the following cases:-

(a) The work is of repetitive nature and is standardised;

(b) Piece rate can easily be determined;

(c) There is uninterrupted flow of work;

The piece rate can be fixed by determining the time required to complete the piece of work on the basis past experience or estimation or time and motion study. In case the job is carried out for the first time or it is a new job then few trial runs can be taken into consideration for fixation of piece rates.

Merits: -

(a) A worker expertise himself by continuously doing the same work on a regular basis.

(b) It leads to increase the efficiency of the worker which leads to earn more income;

(c) It reduces costs;

(d) Idle time is automatically controlled;

(e) The reward is related to effort. Efficiency is recognized;

(f) Less supervision is required.

(g) Workers discover new techniques of producing goods which leads to increase in production.

Demerits: -

(a) Quality is effected in order to increase production.

(b) Wastages of material may increase if not properly supervised.

(c) More supervision and inspection is required so that units produced achieve the standard quality.

(d) Improper use as machine and tools in order to maximize output by the workers.

(e) If work stops due to machine break down, power failure etc. the workers may feel insecure.

(f) In order to earn more the workers may highly stress themselves which may affect their health adversely.

(g) This method is not preferred by inefficient and less efficient workers as there is no guaranteed wages for the period.

(h) It is not easy to determine the piece rate.

Piece Rate with Guaranteed Time Rate: -

A certain standard level of output is determined. Workers are paid on the basis of output. If the output is less than the standard, the worker is paid on time rate basis.

Thus, this system incorporates the merits of the time rate and piece rate system and eliminates any misunderstanding may arise.

Incentive scheme: -

Both time rate and piece rate system have their certain merits and demerits. Incentives system attempts to combine the good aspects of both systems. The main objective of incentive plan is to induce a worker to produce more and to earn a higher wage. Producing more in the same period of time should result in higher pay.

Classification of Incentive Scheme

Incentive scheme can be classified as follows:

(a) Differential piece rate

(b) Premium bonus rate

(c) Group bonus rate

(d) Bonus schemes for indirect workers.

(a) Differential Piece Rate

Efficient and inefficient workers are distinguished. More than one piece rate is determined. Standard are set for each operation or job. Efficient workers, i.e.; those who attain or better the standard set are given a higher rate and inefficient one are given a lower rate. Hence, there is encouragement to improve the performance. As the level of output increases the piece rate also increases. This ratio may be proportionate or proportionately less or more than the increase in output, hence output is maximized.

This system is suitable where:

(a) The method of working are standardized;

(b) The workers do the same job over a long period;

(c) The nature of work is repetitive;

(d) Output of each person can be measured;

(e) The standard time for each job can be determined with precision.

Taylor's Differential Piece Rate System

This system was introduced by· F.W. Taylor, the father of Scientific Management. The main features of this incentive plan are as follows:

(a) Day wages are not guaranteed, i.e. it does not assure any minimum amount of wages to workers.

(b) A standard time for each job is set very carefully after time and motion studies.

(c) Two piece rates are set for each job-the lower rate and the higher rate. The lower piece rate is payable where a worker takes a longer time than the standard time to complete the work. Higher rate is payable when a worker completes the work within the standard time. In other-words, lower

piece rate is payable to inefficient workers and higher piece rate is payable to efficient workers. Usually these rates are 83% of the piece work rate for inefficient workers and 175%, of the piece work rate for efficient workers.

Illustration:1

Standard production = 8 units per hours

Working hours per day = 8 hours

Lower rate = Rs. 5 per unit

Higher rate = Rs. 8.75 per unit

Worker X produces = 7 units.

Worker Y produces = 9 units

Wages of worker X and Y under Taylor's plan will be as follows.

Worker X — He has produced 7 units which is below standard. He will, therefore, be paid at the lower rate of Rs. 5 per unit. His wages will be·7 units @ Rs. 5 = Rs. 35 .

Worker Y - He has produced 9 units which is above standard. He will, therefore, be paid at the higher rate. His: wages will be 9 unit Rs. 8.75 = Rs. 78.75. It will be seen that there is a great difference between the wages of an efficient and an inefficient worker.

Merrick's Differential Piece RateSystem(Multiple Piece Rate System)

This is a modification of Taylor's plan. While Taylor prescribed two rates, Merrick's plan lays down three rates. The lowest rate is for the beginners, the middle rate is for the developing workers and the highest rate is for the highly efficient workers. Efficiency of the workers is determined in terms of percentages. Thus, the rates of remuneration are:

Level of efficiency Piece rate	Piece rate
Upto 83%	Ordinary piece rate
83% to 100%	110% of ordinary piece rate
Above 100%	120% of ordinary piece rate

Like Taylor's plan, this method also does not guarantee minimum wages. The general criticism leveled against Tay1or's plan also applies to it except that it lessens the punitive character of Taylor's plan.

Illustration:2

Standard output = 150 units per day of 8 hours.

Piece rate = Re. 0.20 per unit.

Output of A 100 units, B 135 units and C 180 units.

Calculate the earnings of A, B and C workers under Merrick's Differential Piece Rate System.

Solution-

$$\text{Efficiency in \%} = \frac{\text{Actual output}}{\text{Standard output}} \times 100$$

Rates applicable:$A = \frac{100}{150} \times 100 = 66\frac{2}{3}\%$

$$B = \frac{135}{150} \times 100 = 90\%$$

$$C = \frac{180}{150} \times 100 = 120\%$$

A = Re. 0.20 per unit. (normal rate)

B = Re. 0.20 × 110% = Re. 0.22

C = Re. 0.20 ×120% = 0.24

Earnings:

A = 100 units × Re. 0.20 = Rs. 20.00

B = 135 units × Re. 0.22 = Rs. 29.70

C = 180 units × Re. 0.24 = Rs. 43.20

Illustration:3

Three workers-X ,Y and Z-work in a factory. The following particulars apply to them-

Normal rate per hour	Rs. 0.40
Piece rate	Rs. 0.30 per unit
Standard 2 units per hour	

In a 40 hour week, the production of the worker is as follows:

X	50 units
Y	80 units
Z	120 units

Calculate the earnings of the workers under (a) Taylor differential piece rate system,(b) Merrick differential piece rate system, Also show cost per unit under these methods.

Notes:

(a) The two rates under Taylor's system have been found as follows:

Low piece rate = 83% of 30 paise = 25 P.(approx.)

High piece rate = 175% of 30 paise = Rs. 0.525

Solution:

Workers	Output	Efficiency	**Taylor system** Earnings	**Taylor system** Cost per unit	**Merrick system** Earnings	**Merrick system** Cost per unit
X	50	62.5	12.5	0.25	15	0.3
Y	80	100	42	0.525	26.4	0.33
Z	120	150	63	0.525	43.2	0.36

(c) PREMIUM BONUS PLANS

All the gains of efficient workers and all the losses of inefficient workers benefit the employer under the time rate system. Under the piece rate system, it is the workers who gain or lose.

Under the premium bonus system, the gains are shared by the employer and employees in agreed proportions. Apart from the minimum guaranteed wages, the efficient workers get bonus which depends on the time saved. The standard is determined scientifically. The various incentive schemes should be chosen keeping in mind the nature of the work, with the consent of trade unions in order to make it successful.

These plans regulate the speed of work so that the pace of work is not slow and at the same time it is not fast.

Basically, there are two types of plans. Under the constant sharing plans, the proportion of sharing is constant at all levels of efficiency, but under variable sharing plans, it varies with the time saved.

Emerson's Efficiency Plan

Though minimum daily wages is guaranteed, efficiency is also rewarded. Standard is set based on the time and motion study.

Bonus is payable when efficiency reaches 66-2\3% and increases as the output increases.

Levels of Efficiency	**Piece Rate**
66-2\3	Guaranteed time rate
90%	Time rate +10% as bonus
100%	Time rate +20% as bonus
Above 100%	Time rate+20% as bonus + additional bonus of 1% for every increase of % beyond 100% efficiency

The bonus is usually calculated on the efficiency achieved for all the jobs in a wage period taken together.

$$\text{Efficiency \%} = \frac{\text{Standard time for all jobs done in a period} \times 100}{\text{Time taken for doing all jobs in a period}}$$

Slow work is avoided and work is done at a uniform rate.

But under this scheme, the incentive for efficiency beyond the standard is not appreciable.

Illustration:4

Standard output in 8 hours = 60 units

Actual output in 8 hours. = 72 units

Time rate = Rs. 2 per hour

Calculate earnings under Emerson`s plan.

Solution

Efficiency in % = 72/60* 100 = 120%

Bonus % = 20% + 20%

= 40%

Time wages 8 hours @ Re. 2 = Rs. l6.00

Add; Bonus 40% of Rs. l6 = Rs. 6.40

Total earnings Rs. 22.40

In this Illustration, if the actual output of worker is up to 40 units, i.e. 662/3% efficiency, he will not get any bonus and his wages will be simply time wages i.e., 8 hours X Rs. 2 = Rs. 16. The worker will start earning bonus if his output in 8 hours is above 40 units. lf he produces 60 units i.e. when his efficiency is 100%, his total earnings will be:

Total earnings = Time wages + Bonus

= (8 hrs. >< Rs. 2) + 20%

= 16 + 3.20 = Rs. 19.20

Advantages

1. It guarantees minimum time wages.

2. It is easy to understand and simple to operate.

3. It provides an incentive to beginners and even to those who are less proficient.

Disadvantages

The incentive offered is considered to be inadequate to motivate efficient and ambitious orkers.

1.Halsey Premium Plan

This plan was introduced by F A Halsey in 1891. It is a simple combination of time and piece rate systems. The main features of this plan are as follows:

(a) Workers are paid at a rate per hour for the actual time taken by them.

(b) A standard time is set for each piece of work, job or operation.

(c) If a worker takes standard time or more than the standard time to complete his work, he is paid wages for the actual time taken by him at the time rate. In other words, time wages are guaranteed.

(d) If a worker takes less than the standard time, he is paid a bonus equal to 50% of the time saved at the time rate fixed. Thus, under this system, total earnings of a worker are equal to wages for the actual time taken by him plus a bonus.

The formula for calculating bonus and total earnings is as follows:

Bonus = 50% of [Time saved ×Time rate]

Total earnings = Time rate × Time taken + 50% of [Time saved × Time rate]

Illustration:5

Standard time (or Allowed time) = 50 hours. ,

Wage rate per hour = Rs. 3

Actual time taken = 42 hours ·

Thus time saved = 50 hours - 42 hrs. = 8 hrs.

Earnings = Rs. 3 × 42 hours + 50% of (8 hrs. × Rs. 3)

= Rs. 126 +12 = Rs. 138

Advantages of Halsey Plan

l. It is easy to understand.

2. lt guarantees a minimum time wages to all the workers. Thus, slow and relatively inefficient workers have nothing to fear from it.

3. The benefit resulting from saving in time is equally divided between worker and employer.

4. Bonus is separately calculated for each job. Time saved by a worker on one job is not adjusted against excess time taken by him on another job.

Disadvantages of Halsey Plan

l. Workers do not like the employer to share the benefit of time saved by them.

2. It does not provide the employer with full protection against high rate setting.

3. Extra efficiency of a worker is not fully rewarded.

Halsey Weir Plan

The bonus under this plan is 33.1\3% of the standard time saved.

Total wages =Time taken * Hourly rate + 33.1\3%(Time saved)*Hourly rate

Rowan Plan

This plan is also similar to Halsey Plan except in the calculation of bonus. The main features of Rowan Plan are as follows:

(a) Wages are paid on time basis for the actual time worked by the workers.

(b) A standard time is determined for each piece of work or job.

(c) If a worker completes his work in standard time or in more than standard time, he is paid wages for the time actually taken by him

(d) If a worker completes his work in less than the standard time he is entitled to a bonus.

(e) Bonus is that proportion of wages of actual time taken which the time saved bears to the standard time. Its formula is:

Bonus = Time saved / Time allowed × Time taken × Time rate

Earnings = (Time taken × Time rate) + Bonus.

Illustration: 6

Standard time = 50 hours

Wage rate per hour = Rs. 3

Actual time taken = 42 hours.

Calculate earnings and bonus under Rowan Plan.

Time Saved = 50 hours - 42 hours = 8 hrs.

Bonus = 8÷50 × 42 hours × Rs, 3 = Rs. 20.l6

Earnings = (Time taken × Time rate) + Bonusi

= (42 hrs. × Rs. 3)+ Rs. 20.l6

= Rs. 146.16

Advantages of Rowan Plan

l. Like Halsey plan, it provides guaranteed minimum wages to workers.

2. It protects the employers against loose rate setting

3. lt pays a higher bonus than that under the Halsey plan up to 50% of the standard time saved.

4. The worker is not induced to rush through the work because if the time saved is more than 50% of the standard time, the bonus increases at a decreasing rate.

5. It provides good incentive for comparatively slow workers and beginners.

Comparison of Halsey and Rowan Plan

If the worker finishes the work in half the time fixed for it, the result under Rowen and Halsey plan will be same. If the time saved is less than 50% of the standard time, the Rowan plan is better. If time saved is greater than 50% of the standard time, the Halsey plan is better.

Bedauxe Point System

Under the scheme originated by C.E.Bedauxe, time wages is guaranteed. Earnings increase after the worker attains 100% efficiency level. Standard time and standard work is measured in terms of Bedauxe points, which are also known as B's.

'B' means a standard work performance in a standard minute. In other words, one 'B' unit represents the amount of work which an average worker can do under normal conditions in one minute allowing for the relaxation needed. Workers get a bonus which is equal to 75% of B's saved.

Bonus = B's saved ×Hourly rate ×75÷60×100

Thus, if a person gets 90 B's and hourly rate is Rs.1.20, then his bonus will be:

B's saved =90-60 =30 B's

Bonus =30 ×1.20 × 75÷60×100 = 45 paise

If bonus is given to the extent of the value of the entire time saved, then the scheme will be called the 100% Bedauxe Scheme. But if nothing is mentioned, it is assured that it is 75% Bedauxe Scheme.

Under 75% Bedauxe Scheme, the labour cost increases till 100% efficiency and then starts declining.

Hayne's Scheme

Time wages are guaranteed. The standard time is set in terms of standard man minutes called 'manits'. A manit means a standard work performed in a standard minute. Bonus is given for the time saved. The value of the time saved is shared by the worker and foreman in the ratio of 5:1 if the worker is standardized and repetitive in nature, otherwise, the ratio of sharing between worker, employer and supervisor will be 5:4:1.

The labour cost falls until 100% efficiency is reached. Thereafter, it falls at a decreasing rate if work is non-standardised or remains constant if the work is standardised.

Misc. Illustrations

Illustration: 7

From the following information, calculate the bonus and earnings under Emerson Efficiency Bonus Plan:

Standard output in 12 hours	48
Actual output in 12 hours	42

Time rate Rs.0.75 per hour

If the actual output is 60 units, what will be amount of bonus earnings.

Solution:

Under Emerson Efficiency Bonus Plan earnings will be calculated as follows:

E =T X R + P (T×R)

P (bonus percentage) will vary as follows:

Efficiency	Bonus
(i)Below 66 - ⅔% efficiency	Time wages. No bonus
(ii)66 - ⅔% to 100% efficiency	A bonus increasing 0.01%to20% above basic wages on 100% efficiency
(iii) Over 100%	A bonus of 20% above basic wages plus 1% for each 1% increase in efficiency

Efficiency in terms of output

$$\frac{actual\ output}{standard\ output} \times 100$$

$$\frac{42}{48} \times 100 = 87.5\%$$

Bonus percentage of 87% efficiency is 7.56 and at 88% efficiency is 8.32,given in Emerson Bonus Percentage Table. Thus at 87.5% efficiency we can take bonus percentage as 7.94(average of 7.56 and 8.32%).Bonus will, therefore, be

$$\frac{7.94}{100} \times 12 \times 0.75 = Rs.0.71$$

Earnings

$$12 \times 0.75 + \left(\frac{7.94}{100} \times 12 \times 0.75\right)$$

= 9+0.71 = Rs.9.71

(c) If the actual output in 12 hours is 60 units, efficiency will be:

$$\frac{60}{48} \times 100 = 125\%$$

Bonus percentage = $20\% + (125 - 100) \times 1\%$

= 20 +25 = 45%

Bonus

$$\left(\frac{45}{100} \times 12 \times 0.75\right)$$

Earnings $12 \times 0.75 + \left(\frac{45}{100} \times 12 \times 0.75\right)$

=9 + 4.05 =Rs.13.05

Illustration : 8

In a factory guaranteed wages at the rate of Rs.1.80per hour are paid in a 48 –hour week. By time and motion study it is estimated that to manufacture one unit of a particular product 20 minutes are taken. The time allowed is increased by 25%.During one week Abraham produced 180 units of the product. Calculate his wages under each of the following methods (a) Time rate,(b) Piece rate with a guaranteed weekly wage,(c)Halsey Premium bonus and (d) Rowan Premium Plan

Solution:

(a) Time rate:

E = T×R

= 48 ×1.80 =Rs.86.40

(b) Piece rate:

E = N ×R, where N means number of units produced

and R means rate per unit

= 180 × 0.75= Rs.135

Rate per unit will be found as follows:

Time taken 20 minutes

Incentive allowance 25% 5 minutes

Standard time to manufacture one unit 25 minutes

Rate per minute =Rs. 1.80/60 =Rs.0.03

Rate per unit = Rs.0.03 × 25 = Rs.0.75

(c) Halsey Premium Bonus Plan:

E = T×R +1\2 (S-T) ×R

= 48 ×1.80 + 1\2 (75-48) ×1.80

= 86.40 + 24.30 =Rs.110.70

Standard Time:

One unit takes 25 minutes

180 units should take 180 × 25 = 4,500 minutes

Or 4500/60 =75 hours

(d) Rowen Premium Bonus Plan:

E =T ×R + (S-T)S×T × R

=48 × Rs.1.80 + 27 75×48×Rs.1.80

=Rs.86.40 + Rs.31.10 =Rs.117.50

SELF CHECK QUESTIONS

1. What is meant by an 'incentive plan' in the remuneration of labour? Also explain their plans in brief.
2. Discuss the principles methods of wage payments.
3. What are the main incentives wage payment system methods? Explain three in brief.

Practical Questions

Q.1 From the following particulars calculate the earnings of a worker under Rowen Premium Bonus System and Halsey Premium Bonus System:

Hourly rate of wages(guaranteed) Rs.0.75

Standard time for producing one dozen articles 3 Hours

Actual time taken by the worker to produce 20 dozen articles 48 Hours

Ans. Rowen Rs.43.20;Halsey Rs.40.50.

Q.2 What earnings will workmen receive under Halsey Plan and Rowen Plan if he executes a piece of work in 60 hours as against 75 hours allowed? His hourly rate is Rs.2 and he is paid 50% of the time saved under Halsey Plan. He gets a dearness allowance of Rs.8 per day of 8 hours worked in addition to his wages.

Ans. Under Halsey Plan Rs.195; Under Rowen Plan Rs.204

Q.3 Calculate the earnings under (a) Time rate (b)Piece rate (c)Halsey and (d)Rowen methods, from the following information:

Standard time 40 hours Time taken 30 hours

Wages are paid at Rs.1 per hour and a dearness allowance is paid at 50 paise per hour worked.

Ans.(a)Rs.45;(b)Rs.55;(c)Rs.50;(d)Rs.52.50

Q.4 A workmen takes 9 hours to complete a job on daily wages and 6 hours on a scheme of payment by result. His day rate is Rs.1.50 per hour. The material cost of the product is Rs.24 and the work overhead is recovered @ 150% of the total direct wage. Calculate the factory cost of the product (a) the piece -work plan, (b) the Halsey plan and (c) the Rowen plan.

Ans. Factory cost-(a) Rs.46.50; (b) Rs.52.125 and (c) Rs.54.00

LESSON 6

ALLOCATION, APPORTIONMENT AND ABSORPTION OF OVERHEADS

CONTEXT OF THE LESSON

This lesson deals with the treatment of indirect costs also known as overheads. In order to determine the total cost of the product the overheads are to be allocated to the various

departments on some suitable basis. The process and various methods for distribution of overheads to the various products have been explained in this lesson.

OBJECTIVES OF THE LESSON

- To understand the various types of overheads
- To deal with various methods of distribution of overheads
- To deal with various methods of Absorption of overheads

INTRODUCTION

In Cost Accounting, for the purpose of determination of cost and its control, the analysis and collection of overheads, their allocation and apportionment to different cost centres and absorption to products or services plays an important role. An effective system of distribution of overheads can lead for accuracy in determination of cost of products and services. It is therefore, necessary to ensure that a standard practices for allocation, apportionment and absorption of overheads should be followed within the organization for preparation of cost statements.

DEFINITION:

OVERHEADS

Overheads comprise of cost of indirect materials, indirect labour and indirect expenses which are not directly identifiable or traceable and allocable to a cost object in an economically feasible way

CLASSIFICATION OF OVERHEADS

Overheads can be classified on the basis of functions to which the overheads are related viz.

- Production overheads
- Administrative overheads
- Selling overheads
- Distribution overheads

Overhead can also be classified on the basis of behavior. On the basis of behavior overhead can be classified as variable overheads, semi-variable overheads and fixed overheads.

Variable overheads are those expenses which vary in same proportion to the change of volume of production. For example, cost of utilities etc.

Fixed overheads are those expenseswhose values do not change with the change in the volume of production. For example salaries, rent etc.

Semi-variable overheads are those expenses which are partly affected by change in the production volume. A part of the overhead is variable and a part of the overhead is fixed.

COLLECTION OF OVERHEADS

Collection of overheads refers to the pooling of various indirect items of expenses from books of account and other records into certain logical groups having regards to their nature and purpose.

Overheads are collected on the basis of predetermined groups which are termed as cost pools. Homogeneity of the cost components in respect of their behavior and character is to be considered while developing the cost pool. Variable and fixed overheads should be collected in separate cost pools under a cost centre. A greater degree of homogeneity in the cost pools are to be maintained to make the apportionment of overheads more rationale and scientific.

ALLOCATION OF OVERHEADS

Allocation of overheads is a process of assigning a particular item of cost directly to a cost centre. An item of expense which can be directly, wholly and exclusively related to a cost centre is to be allocated to the cost centre. For example, depreciation of a particular machine should be allocated to a particular cost centre if the machine is directly attached to the cost centre.

APPORTIONMENT OF OVERHEAD

Apportionment of overhead is the process of distribution of overheads to more than one cost centre on some equitable basis. Thus, a particular item of expense which is not directly related to one cost centre but is related to more than one cost centre is required to be distributed on various cost centre is known as apportionment of overhead.

When an item of indirect expense is common to various cost centers, then it has to be apportioned to the cost centers on an equitable basis. For example, the expenditure on general repair and maintenance pertaining to a department can be allocated to that department but has to be apportioned to various machines (Cost Centers) in the department. If the department is involved in the production of a single product, the whole repair & maintenance of the department may be allocated to the product.

SELF CHECK QUESTIONS

1. What do you mean by overhead?
2. Classify the various types of overheads.
3. What do you mean by allocation and apportionment of overheads?
4. What do you mean by fixed and variable expenses?
5. What is a semi variable expense? Give two examples of it.

PRIMARY AND SECONDARY DISTRIBUTION OF OVERHEADS:

An organization which deals in various products may have single service department which may be rendering services to the various production departments and other service departments. The costs of services are required to be apportioned to the relevant departments Initially it will be required to apportion the overheads to different departments and later on to apportion the costs of service department to production department on an equitable and justified basis. The first process is termed as primary distribution and the second process is termed as secondary distribution of overheads.

Absorption of overheads - Absorption of overheads is a process of charging of overheads from cost centers to products or services by means of absorption rates for each cost center which is calculated as follows:

$$OverheadAbsorptionRate = \frac{\textbf{Totaloverheadsofthecostcentre}}{\textbf{Totalquantumofbase}}$$

The base (denominator) is selected on the basis of type of the cost centre and its contribution to the products or services, for example, machine hours, labour hours, quantity produced etc.

Overhead absorbed = Overhead absorption rate × units of base in product or service

APPORTIONMENT AND ABSORPTION OF PRODUCTION OVERHEADS

Overheads can be apportioned to different cost centers on the basis of following two principles:

i) **Cause and Effect** - Cause is the process or operation or activity and effect is the incurrence of cost. Apportionment of overheads based on this basis ensures better rationality as it is guided by the relationship between cost object and cost.

ii) **Benefits received** – Overheads can also be apportioned to the various cost centers in proportion to the benefits received by them.

PRIMARY DISTRIBUTION OF OVERHEADS:

Basis of primary apportionment of items of production overheads is to be selected to distribute them among the cost centres following the above two principles as given above.

Once the base is selected, the same is to be followed consistently and uniformly. However, change in basis for apportionment can be adopted only when it is considered necessary due to change in circumstances like change in technology, degree of mechanization, product mix, etc.

Basis of primary distribution of some items of production overheads

Item of Cost	Basis of Apportionment

Power	H.P. rating of Machines x hours x LF*
Fuel	Consumption rate x hour
Jigs, tools & fixtures	Machine hours or Man hours
Crane hire charges	Crane hours or weight of materials handled
Supervisors' salary & fringe benefits	Number of employees
Labour welfare cost	Number of employees
Rent & rates	Floor or Space area
Insurance	Value of fixed asset
Depreciation	Value of fixed asset

* LF = Motor Load Factor

SECONDARY DISTRIBUTION OF OVERHEADS:

Secondary distribution of overheads may be apportioned by following either Reciprocal basis or Non-Reciprocal Basis. While reciprocal basis considers the exchange of service among the service departments, non-reciprocal basis considers only one directional service flow from a service department to other production department.

SECONDARY APPORTIONMENT OF OVERHEADS ON RECIPROCAL BASIS

The services provided by certain service department are also utilized by other service departments. In reciprocal secondary distribution, the cost of service department is apportioned to production department as well as other service department. In such case, any one of the following three methods may be followed:

I. Repeated Distribution Method

II. Trial & Error Method

III. Simultaneous Equation Method

REPEATED DISTRIBUTION METHOD

Following steps are required to be followed under this method:

i) The proportion at which the costs of a service department are to be distributed to production department and other service department is determined.

ii) Costs of first service department are to be apportioned to production department and service department in the proportion as determined in step (i).

iii) Similarly, the cost of other service department is to be apportioned.

iv) This process as stated in (ii) and (iii) are to be continued till the amount remaining undistributed in the service amount are negligibly small. The negligible small amount left with service department may be distributed to production department.

Reciprocal Overheads Apportionment:Repeated Method

	Production Department			Service Department	
	Machine	**Assembly**	**Finishing**	**Stores**	**Repair**
Ratio of apportionment from Stores	50%	20%	15%		15%
Ratio apportionment from Repair	40%	35%	15%	10%	
Primary Distribution	35500.00	31900.00	14800.00	5000.0	6000.00
Stores Dept.	2500.00	1000.00	750.00	5000.0	750.00
Total	38000.00	32900.00	15550.00	10000.0	6750.00
Repairs & Maintenance Dept	2700.00	2362.50	1012.5	675.00	-6750.00
Total	40700.00	35262.50	16562.5	675.00	0.00
Stores Dept.	337.50	135.00	101.25	-675.00	101.25
Total	41037.50	35397.50	16663.75	0.00	101.25
Repairs & Maintenance Dept	40.50	35.44	15.19	10.13	-101.25
Total	41078.00	35432.94	16678.94	10.13	0.00
Stores Dept.	5.06	2.03	1.52	-10.13	1.52
Total	41083.06	35434.96	16680.46	0.00	1.52
Repairs & Maintenance Dept	0.61	0.53	0.23	0.15	-1.52
Total	41083.67	35435.49	16680.68	0.15	0.00
Stores Dept.	0.10	0.03	0.02	-0.15	0.00
Total	41083.77	35435.52	16680.71	0.00	0.00

Reciprocal Overhead Apportionment : Trial & Error Method					
	Production Department			Service Department	
	Machine	Assembly	Finishing	Stores	Repair
Ratio of apportionment from Stores	50%	20%	15%		15%
Ratio of apportionment from Repair	40%	35%	15%	10%	
Distribution from					
Primary Distribution	35500.00	31900.00	14800.00	5000.00	6000.00
Distribution between service centres					
Stores Dept.				0.00	750.00
Total				5000.00	6750.00
Repairs & Maintenance To stores				675.00	0
Stores Dept. to Repair & Maintenance				0.00	101.25
Repairs & Maintenance To stores				10.13	0.00
Stores Dept. to Repair & Maintenance				0.00	1.52
Repairs & Maintenance To stores				0.15	0.00
Stores Dept. to Repair & Maintenance				0.00	0.02
Gross cost of service cost centres				5685.28	6852.79
Stores to Production cost centres	2842.63	1137.06	852.79	-5685.28	
Repairs & Maintenance to Production centres	2741.14	2398.46	1027.92		-6852.79

Total	41083.77	35435.52	16680.71	0	0

Trial and Error Method

This method is to be followed when the question of distribution of costs of service department which are interlocked among themselves arises. In the first step, gross costs of services of service department are determined and then in the second step, costs of service department are apportioned to production department. The following process can be followed in this regard:

i) The proportion at which the costs of a service department are to be distributed to production department and other service department is determined.

i) Cost of first service department is distributed to the other service department in the proportion of service they received from the first as assessed in step (i).

ii) In the next step, total cost of second service department so arrived has to be distributed to the other service department in the proportion of service they received from the second as assessed in step (i).

iii) Similarly, the cost of other service department to be apportioned to the service department.

v) This process as described in (iii) and (iv) is to be continued till the figures remaining undistributed in the service department is negligibly small.

i) At the last, total cost of service department is to be distributed to production department.

Example:

Simultaneous Equation Method

The simultaneous equation method is to be adopted to take care of secondary distribution of cost of service department to production department with the help of mathematical formula. Steps to be followed:

i) Proportion of service benefits received by different cost centres from a cost centre are assessed on the basis of records

ii) The same ratios are used as coefficients in the equations framed for apportionment of cost of service department to production department.

iii) Solution of the equations gives the cost of service department.

iv) Cost of service department to be distributed to production department.

Example,

Reciprocal Overhead Apportionment : Simultaneous Equation Method					
	Production Departments			**Service Departments**	
	Machine	**Assembly**	**Finishing**	**Stores**	**Repair**
Ratio of apportionment from Stores	50%	20%	15%		15%
Ratio of apportionment from Repair	40%	35%	15%	10%	
Distribution from					
Primary Distribution	35500.00	31900.00	14800.00	5000.00	6000.00

Let x, ybe Store Dept and Repair & Maintenance Dept expenses respectively.

$$x - 0.10y = 5000$$

$$-0.15x + y = 6000$$

$$\text{Solving} \quad x = 5685.28, \quad y = 6852.79$$

Now, distribution of expenses will be as follows:

	Production Departments			Service Departments	
	Machine	Assembly	Finishing	Stores	Repair
Ratio of apportionment from Stores	50%	20%	15%		15%
Ratio of apportionment from Repair	40%	35%	15%	10%	
Amounts from Primary Distribution	35500.00	31900.00	14800.00	5685.28	6852.79

Stores to Production cost centres	2842.63	1137.06	852.79	-5685.28	
Repairs & Maint to Production centres	2741.14	2398.46	1027.92		6852.79
Total	**41083.77**	**35435.52**	**16680.71**	**0**	**0**

Secondary Apportionment of Overheads on Non-Reciprocal basis

In non-reciprocal secondary distribution, the costs of service cost centres are apportioned to the production cost centres. Steps involved are :

i) The cost of first service cost centre is apportioned on a suitable basis to production cost centres.

ii) The next step is to apportion the cost of second service centre to the production cost centres as indicated in stage (i).

iii) The process is to be continued till the costs of all service cost centres are apportioned.

Example,

Non-Reciprocal Overheads Apportionment

Primary Distribution

			Production Departments			**Service Departments**	
Expenses	**Basis of allocation / apportionment**	**Total (Rs.)**	**Machine Shop**	**Assembly Shop**	**Finishing Dept**	**Stores**	**Repairs & Maint.**
Consumable stores	**Direct Materials**	15,400	5,200	6,000	2,000	600	1,600
Supervision	**Direct Wages**	22,800	7,900	5,100	6,100	2,200	1,500
Rent & Rates	**Area**	10,000	3,000	2,000	2,500	1,000	1,500
Insurance	**Asset Value**	2,000	800	900	200	50	50
	Asset Value	30,000	12,000	13,500	3,000	750	750
		9,000	5,400	3,600	-	-	-

Depreciation	**H.P x Hours x LF**	4,000	1,200	800	1,000	400	600
Power							
Light & Heat	**Area**						
Total		**93,200**	**35,500**	**31,900**	**14,800**	**5,000**	**6,000**

Secondary Distribution

			Production Departments			**Service Departments**	
Expenses	**Basis of allocation / apportionment**	**Total (Rs.)**	**Machine Shop**	**Assembly Shop**	**Finishing Dept**	**Stores**	**Repairs & Maint.**
Primary dist. (earlier Table)		93,200	35,500	31,900	14,800	5,000	6,000
Stores	**Direct Material**		2,250	1,500	1,250	- 5,000	
Repairs & Maint	**(9 : 6 :5)** **Direct** **(2: 3: 1)**		2,000	3,000	1,000		- 6,000
	Total	93,200	39, 750	36.400	17,050	0	0

Self Check Questions

1. What do you mean by primary and secondary distribution of overheads?

2. What are the various methods of secondary distribution of overheads?

Absorption of Production overheads:

Production Overheads absorption rate for each cost centre is to be determined with the help of quantum base as indicated in 5.6 above and the formula as indicated below :

$$\boldsymbol{Fixedoverheadsabsorptionrate} = \frac{\boldsymbol{Fixedoverheads}}{\textbf{Normal or actual quantum of base, whichever is higher}}$$

$$\mathbf{Variableoverheadsabsorptionrate} = \frac{\mathbf{Variableoverheads}}{\mathbf{Actualquantumofbase}}$$

A pre-determined rate may be used on a provisional basis for internal management decision making such as cost estimates for quotation, fixation of selling price etc. These rates are to be calculated for each cost centre for a particular period. Budgeted overheads for the respective cost centres for the period concerned are to be taken as numerator and budgeted normal base for the period as denominator for determining the rate.

$$\mathbf{Pre-determinedoverheadRate} = \frac{\mathbf{BudgetedOverheadsfortheperiod}}{\mathbf{Budgetednormalbasefortheperiod}}$$

The amount of total overheads absorbed by a product, service or activity will be the sum total of the overheads absorbed from individual cost centres on pre-determined basis. The difference between overheads absorbed on pre-determined basis and the actual overheads incurred is the under- or over-absorption of overheads.

The under- or over- absorption of overheads is mainly due to variation between the estimation and actual.

Method of absorption of overheads

Production overheads

There are many ways to absorb overheads which are as follows:

DIRECT MATERIAL COST PERCENTAGE

Suitable in situations where:

- the material value has some relationship with the overheads;
- quality and prices of materials do not vary drastically;
- quantity and cost of materials in each product is almost the same and
- where processing is uniform

Unsuitable when:

- Overheads are time-based where there is little relationship with the cost of material used hence products with high material content absorb more overheads.

Example

$$\boldsymbol{Directmaterialcostpercentagerate}\frac{\boldsymbol{Budgetedproductionoverhead}}{\boldsymbol{Budgetedproductionmaterialcost}} \times 100$$

$$= \frac{70.00}{10{,}000} \times 100$$

= 700%

Overhead absorbed by the job= 10 x700

DIRECT LABOUR COST PERCENTAGE

Suitable in situations where:

- wages have some relationship with the overheads
- one type of labour rate and one type of pay rate in the cost centre.

Need to be careful to charge overheads with higher labour costs in the event of different level of skill.

Example

$$\mathbf{DirectLabourCostPercentageRate} = \frac{\boldsymbol{Budgetedoverhead}}{\boldsymbol{Budgeteddirectmaterialcost}} \times \mathbf{100}$$

$$= \frac{70.000}{40{,}000} \times 100$$

=175%

Overhead absorbed by the job= 30 x 175% =52.50

PRIME COST PERCENTAGE

Prime cost consists of direct material and direct labour. Not a good absorption method as it has little relationship with overheads.

$$\mathbf{PrimeCostPercentageRate} = \frac{\boldsymbol{Budgetedoverhead}}{\mathbf{Prime}\boldsymbol{cost}} \times \mathbf{100}$$

$$= \frac{70.000}{50{,}000(10{,}000 + 40{,}000)} \times 100$$

=140%

Overhead absorbed by the job= 40(10+30) x140% =56

DIRECT LABOUR HOUR RATE

Suitable in labour intensive industry or where certain departments are still using manual means. Uses time as a basis.

Disadvantages:

- It assumes that operations that take the same time are costed with the same overheads irrespective of the operators different pay rates.

also, more businesses are deploying machines, hence this absorption method is getting more unpopular.

$$\mathbf{DirectLabourhourRate} = \frac{\boldsymbol{Budgetedoverhead}}{\boldsymbol{Budgetedlabourhour}} \times \mathbf{100}$$

$$= \frac{70.000}{30{,}000} \times 100$$

=2.34 %

Overhead absorbed by the job= 20 hours x2.34 =46.80

MACHINE HOUR RATE

Is suitable when the business is of capital intensive in nature or production being carried out by machines.

Disadvantage:

If a cost centre uses different type of machines, then we cannot use a single machine rate. A separate machine rate must be computed for each machine or group of machines. Also, there is a need to keep records of the machine time for each operation. This method therefore can be very tedious and increases clerical work

$$\boldsymbol{Machine}\mathbf{hourRate} = \frac{\mathbf{Budgetedoverhead}}{\mathbf{Budgeted}\boldsymbol{Machine}\mathbf{hour}} \times \mathbf{100}$$

$$= \frac{70.000}{20{,}000} \times 100$$

=3.5 per machine hour

Overhead Absorbed by the job= 10 hours x 3.5 =35

COST UNIT RATE

Suitable where cost units passing through a cost centre are homogenous.

Applies in standard costing or budgetary control systems. Cost Unit Rate method is very simple and a more direct mean.

$$\boldsymbol{Unit}\mathbf{Rate} = \frac{\mathbf{Budgetedoverhead}}{\mathbf{Budgeted}\boldsymbol{output}} \times \mathbf{100}$$

$$= \frac{70.000}{5{,}000} \times 100$$

=14 per unit

Overhead absorbed by the job= 14 x 1unit =14

Apportionment and Absorption of Administrative Overheads

Administrative overheads include the following items of cost:

Printing and stationery, other office supplies

Employees cost – Salaries of administrative staff

Establishment expenses – Office rent & rates, insurance, depreciation of office building and other assets, legal expenses, audit fees, bank charges etc.

Administrative overheads are to be collected in different cost pools such as :

- General Office
- Personnel department
- Accounts department
- Legal department
- Secretarial department etc

Administrative overheads can be further analysed into two – one for production activities and other for sales and distribution activities. Costs collected under the cost pools indicated above are to be distributed to administrative overheads relating to production activities and administrative overheads relating to selling and distribution activities on rational basis for each cost pool.

Administrative overheads relating to production activities are to be apportioned to different production cost centres on the basis conversion costs of production cost centres. The apportioned overheads are absorbed to products on the basis of the normal capacity or actual capacity, whichever is higher.

In case of under-absorption or over-absorption of administrative overheads relating to production, the same shall also be adjusted with Costing Profit & Loss Account.

Apportionment and Absorption of Selling overheads and Distribution overheads

The selling overheads and distribution overheads are collected under different cost pools such as :

Selling Overheads:

(i) Sales Employees cost

(ii) Rent

(iii) Traveling expenses

(iv) Warranty claim

(v) Brokerage & Commission

(vi) Advertisement relating to sales and sales promotion

(vii) Sales incentive

(viii) Bad debt etc

Distribution Overheads:

(i) Secondary Packaging

(ii) Freight & forwarding

(iii) Warehousing & storage

(iv) Insurance etc.

Some items of selling overheads and distribution overheads are directly identified and absorbed to products or services and remaining part of selling and distribution overhead along with the with share of administration overheads relating to selling and distribution activities are to be apportioned to various products or jobs or services on the basis of net actual sales value (i.e. Gross sales value less excise duty, sales tax and other government levies).

SELF CHECK QUESTIONS

1.What are the various methods of absoption of factory overheads.

2. Discuss the method of apportionment and absorption of administrative overhead.

MACHINE HOUR RATE

Machine hour rate is a method of absorbing factory overhead. This method is applied in those industries where production activity heavily depends on machines. The machine hour rate is an actual or predetermined rate of cost apportionment for overhead absorption, which is calculated by dividing the cost to be apportioned or absorbed by the number of hours for which a machine or machines are operated or expected to be operated.

PROCESS OF MACHINE HOUR RATE METHOD

The following process is generally adopted to determine the machine hour rate:

(i) All the factory overhead are apportioned to the various machines or group of machines on some suitable basis.

(ii) Working hours of a machine are calculated for the period for which the machine is to run.

(iii) The overheads of a machine cost centre are divided by the effective machine hours, the machine hour rate pertaining to the machine or group of machines is determined.

BASES OF APPORTIONMENT OF FACTORY OVERHEAD TO THE MACHINES

The following basis is generally adopted for apportionment of expenses which are common to more than one machine:

(i) Rent, Rates and Taxes etc: Floor area occupied by the machine
(ii) Depreciation : Actual depreciation as per plant register
(iii) Lighting: Number of bulbs or wattage used for lighting by the machines
(iv) Heating: Floor area occupied by the machine or technical estimates
(v) Power: Horse power of the machine or technical estimate by meter reading
(vi) Repairs and Maintenance: Allocation as per actual repairs or according to hours worked by the machines
(vii) Supervisory Expenses: Number of hours devoted by the supervisor on each machine
(viii) Labour Welfare Expenses: In the ratio of number of employee engaged on machines
(ix) Insurance: In the ratio of machine value keeping into consideration the insurance period
(x) Lubricating oil, cotton waste and consumable stores: On the basis of machine hour worked in the certain period or on the basis of size of machine
(xi) Interest included in hire purchase : Interest is treated as an overhead and actual interest of the machine is charged as overhead for the particular machine

COMPUTATION OF MACHINE HOUR RATE

In order to calculate the machine hour rate, the factory overhead is divided into (a) Standing charges and (b) Machine or Variable expenses

(A) **Standing Charges:** Standing charges are those expenses which are not related to the running of the machine and these expenses are bound to incur even if the machine remains idle. The following expenses are generally included in this category:
  (i) Rent of the Factory,
  (ii) Rates and Taxes,
  (iii) Insurance premium of Factory building,
  (iv) Insurance premium of Machines,
  (v) Salary of Manager,Supervisor, Foreman etc.,
  (vi) General Lighting,
  (vii) Cotton Waste, Lubricants oil,
  (viii) Consumable stores,
  (ix) Sundry Supplies
  (x) Operators Wages: Generally Operators wages is treated as direct labour cost and is shown in Prime cost. However, if an operator works on several machine then the wages should be shown as standing charges

  All the standing charges are totaled together and divided by the working hours of the machine of the specified period thus obtaining hourly rate of standing charges.

(B) **Machine Expenses:** Machine expenses are those expenses which are incurred on running of the machines. These expenses are calculated for hourly rate on individual basis. Generally following expenses are treated as machine expenses:
  (i) Depreciation of machine
  (ii) Power Expenses
  (iii) Repair and Maintenance charges

Treatment of Idle time and setting time:

The idle time in respect of a machine is generally deducted from the budgeted working hours of a machine in order to calculate the effective machine hour. Similarly, if a machine requires some setting time before it is ready for operation, the setting time should be added in calculating effective hours of the machine.

ILLUSTRATION

1. Calculate Machine Hour Rate for recovery of overhead for a machine from the following data. There is a group of 4 similar machines in the department.

Original cost of 4 Machines Rs. 76,800; Depreciation at 10% per annum on straight line method; Maintenance cost average Rs. 8 per day of 8 hours for the group machines.

Power 25 Paisa per running hour (per machine), Supervision for the machine group Rs. 640 per month. Allocation of building depreciation for 4 Machines on a floor area basis Rs. 80 per month.

Share of manufacturing overheads Rs. 240 per month for the group.

Normal working days in the year 300; Normal running : One shift of 8 hours, Each machine remained idle for 20% of its normal running hours.

Solution ·

Computation of Machine Hour Rate

Base Period : 1 year Working Hours : 300 ×8 = 2,400 — 480 = 1,920

Particular	Per year	Per hour
(A).Standing Expenses :	Rs.	Rs.
(i) Supervision Exp. (Rs. 640 × 12 months / 4)	1,920	
(ii) Depreciation of Building (Rs. 80 × 12 months / 4)	240	
(iii) Manufacturing Overhead (Rs. 240 × 12 months / 4)	720	
	2880	
Standing Expenses per hour (Rs. 2,880 / 1,920 hrs.)		
		1.50
(B) Machine Expenses		
(i) Depreciation (Rs. 76,800 / 4 = Rs. 19,200 × 10%		
=Rs. 1,920 / 1,920 hrs.)		1.00
(ii) Power		0.25
(iii) Maintenance cost (Re. 1 per hour for 4 machines)		0.25
Machine Expenses		3.00

2. A Machine costing Rs. 28,700, excluding installation cost of Rs. 300, has an anticipated life of 10 years with residual value of Rs. 500. It is depreciated on straight line method. From the following particulars, compute machine hour rate on the basis of anticipated working hours:

(i) Rent and Rates for the factory is Rs. 6,000 per annum and 10% of the effective area is occupied by this machine.

(ii) Insurance for this machine is Rs. 450 per annum.

(iii) Repairs and Maintenance for the whole factory for the year is Rs. 2,000; 25% of this amount relates to this machine.

(iv) Consumable Stores etc. attributable to this machine for the whole year is Rs. 110.

(v) Total of production services is Rs. 5,000; 20% of this amount is applicable to this machine.

(vi) Power cost is Re. 0.50 per Working Hour.

(vii) The year contains 250 working days of 8 hours each but it is anticipated that the machine will remain idle 20% of this time.

Solution

Total hours = 250 working days x 8 hours each day = 2000 hours

Less idle time being 20% of 2,000 hours = 400 hours

Effective working hours = 1600 hours

Particular	Per year	Per hour
(A).Standing Charges :	**Rs.**	**Rs**.
(i) Rent and Rates (Rs. 6,000 × 10%)	600.00	
(ii) Insurance 450.00	450.00	
(iii) Consumable Stores	110.00	
(iv) Production service overheads (Rs. 5,000 × 20%)	1,000.00	
Total Standing Charges Rs.	2,160.00	
Standing Expenses per hour (Rs. 2, 160 / 1,600 hrs.)		1.35
(B) Machine Expenses		
(i) Depreciation $\frac{28{,}700+300-500}{10\times 1{,}600}$		1.78
(ii) Repairs and Maintenance (Rs. 2,000 × 25% = Rs. 500 / 1,600 hrs.)		0.31 0.50

(iii) Power **Machine Hour Rate**		3.94

3. In a factory department, a machine costs Rs. 1,15,000. It is expected that it will work for about 20,000 hours and its scrap value is estimated at Rs. 15,000. The rent of the factory department is Rs. 4,000 p.m. of the 25% of the area of the department is utilised for conducting the operation of the machine. One foreman and an attendant are employed on a salary of Rs. 2,000 and Rs. 1,000 p.m. respectively, to work on one more machine of a similar type. The expenses of the month incurred in the department are as follows:

Light charges for the department Rs. 800, having 16 points in all out of which only 4 points are used at the machine. Total power used for two machines of equal horse-power Rs. 3,200; Indirect Labour for the machine Rs. 500 and Repairs and Renewals Rs. 400.

You are required to find out the Machine Hour Rate for one month when it is expected to work for 40 hours a week. ‘

Solution: **Computation of Machine Hour Rate**

Machine No.....

Standing Charges	Rs.	Rs.
Rent (Departmental Rent Rs. 4,000; 1/4 for the machine)	1,000	
Foreman’s salary (for one machine)	1,000	
Attendant’s salary (for one machine)	500	
Lighting charges $\frac{800 \times 4}{16}$	200	
Indirect Labour	500	
Total Standing Charges	**3,200**	
Hourly rate for standing charges (3,200 ÷160)		20.00
Machine Expenses		
Hourly rate for depreciation (1,15,000 — 15,000 ÷ 20,000)		5.00
Repairs and Renewals (400 ÷ 160)		2.50
Power (for one machine) (1,600÷ 160)		10.00
Machine Hour Rate		**37.50**

4. The following annual charges are incurred in respect of a machine where manual labour is almost nil and where the work is done by means of five machines of exactly similar type and specifications:

1. Rent and Rates (proportional to the floor space occupied) for the shop Rs. 48,000

2. Depreciation on each machine Rs. 5,000

3. Repairs and maintenance for five machines Rs.10, 000

4. Power (as per metre) @ Rs. 10 per 16 units consumed for the shop) Rs. 37,500

5. Electric charges for light in the shop Rs. 5,400

6. Attendants: There are two attendants for the five machines and they are each paid Rs. 600 per month.

7. Supervision: For the five machines in the shop there is one supervisor whose emoluments are Rs. 2,500 per month.

8. Sundry supplies, such as Lubricants, Jute and Cotton waste, etc. for the shop Rs. 4950

9. Hire-purchase instalment payable for the machines

(including Rs. 3,000 as interest) A

The machine uses 10 units of power per hour.

Calculate the Machine Hour Rate for the year.

Solution : Computation of Machine Hour Rate

Machine No.....

Standing Charges	Rs.	Rs.
Rent & Rates per Machine (Rs. 48,000 ÷5 Machines) 9,600	9,600	
light in Workshop per Machine (Rs. 5,400 ÷ 5 Machines)	1,080	
Salary of attendants per Machine (Rs.600 × 2 × 12 ÷ 5)	2,880	
Supervision per Machine (Rs. 2,500 × 12 ÷ 5)	6,000	
Sundry Supplied per Machine (Rs. 4,950÷5)	990	
Eve-purchase Charges per Machine (Rs. 3,000 ÷ 5)	600	
Total Fixed Expenses	**21,150**	
Hourly rate for standing charges (Rs. 21,150 ÷ 1,200 hrs.)		17.625
Machine Expenses :		
Depreciation (Rs. 5,000 ÷ 1,200 hrs.)		4.166
Repairs & Maint. (Rs. 2,000 ÷ 1,200 hrs.)		1.667
Power (10 Units per hour, @ Rs. 10 per 16 Units)		6.250
Machine Hour Rate		29.708

Working hours of Machine have been computed as follows:
Power Units @ Rs. 1.00 per 1.6 Units = Rs. 37,500 × 1.6 = 60,000 which is for all 5 Machines. Hence, per Machine Consumption is 12,000 Units. Machine consumes 10 Units per hour and hence a Machine, Runs for 1,200 Hrs in a year

SELF CHECK QUESTION

1. What do you mean by machine hour rate? How is it determined?

2. What is the process of determining machine hour rate? What factors do you keep in view while ascertaining the rate.

3. What is meant by overhead expenses? Give various methods of absorbing overhead and discuss any two of these method in detail?

4. What do you understand by overheads? Discuss the different methods of allocating the factory overheads.

5. What is the difference between apportionment of overheads and absorption of overheads? State with the help of imaginary figures.

PRACTICAL QUESTIONS

1. The following annual charges are incurred in respect of a machine where manual labour is almost nil and where the work is done by means of five machines of exactly similar type and specifications:

   1. Rent and Rates (proportional to the floor space occupied) for the shop 48,000

   2. Depreciation on each machine 5,000

   3. Repairs and maintenance for five machines 10,000

   4. Power (as per metre) @ Rs. l0 per 16 units consumed for the shop 37,500

   5. Electric charges for light in the shop 5,400

   6. Attendants: There are two attendants for the five machines and they are each paid Rs. 600 per month.

   7. Supervision: For the five machines in the shop there is one supervisor whose emollients are Rs. 2.500 per month.

   8. Sundry supplies, such as Lubricants, Jute and Cotton waste.Etc. for the shop 4,950

   9. Hire-purchase installment payable for the machines (including Rs. 3.000 as interest) 12,000

   10. The machine uses l0 units of power per hour.

   Calculate the Machine Hour Rate for the year.

2. The expenditure pertaining to a department having four identical machines is given below:

Rent and Taxes	6,000 perannum,
Power consumed (at 10 paisa per unit) .	4,800 per annum
Repair	1,000 per annum
Lighting expenses	800 per annum
Consumable stores	100 per annum
Depreciation on each machine	600 per annum

Hire-purchase installment payable for the machines	
(Including Rs. 300 interest)	1,200 per annum
Supervisor`s Salaries	600 per annum

Attendants: There are two attendants in the department. Each is paid Rs. 60 per month.

The machine uses 10 units of power per hour.

Calculate the machine hour rate of the machine.

Ans. Machine Hours: 1,200; Machine Hour Rate: Rs. 5.008.

3. Prepare a Machine Hour Rate computation for the month of January, 2005 to recover the overhead expenses from the information indicated below:

	Per Annum (Rs.)
Rent of the Department (Space occupied by the machine 1/4)	1,200
Lighting (12 men in the department; 2 men are engaged on this machine)	576
Insurance	96
Cotton Waste, Oil, etc.	60
Salary of Foreman (one-third of foreman's time is spent on this machine and the remaining on other two machines)	9,000

Cost of machine is Rs. 27,500 and scrap value of machine is Rs. 500. It is assumed from the past experience that:

(a) The machine will work 1,200 hours per annum.

(b) It will incur expenditure of Rs. 4,500 in respect of repairs and maintenance for whole working life of machine. , .

(c) It will consume 5 units of power per hour at the rate of 10 Paisa per unit.

(d) The working life-time of the machine will be 15,000 hours.

Ans. Rs. 5.56 per hour.

4. The following annual expenses have been incurred in respect of a shop having 5 identical machines:

	Rs.	
(i) Rent and Rates		4000
(ii) Power consumed by the shop @ 61/4 Paisa per unit	3,750	
(iii) Repair and maintenance for the machines	1,000	
(iv) Lighting charges for the lighting of the shop	500	
(v) Attendant's salary (There are two attendants and each is paid Rs. 50 per month)		

(vi) Supervisor's salary (There is one supervisor for the 5 machines, his monthly salary is Rs. 300)

(vii) Lubricants and cotton waste for the shop. 100

(viii) Hire-purchase installment for the machines (including Rs. 300 for interest) 2,300

(ix) Each machine consumes 10 units of power per hour.

(x) Depreciation on each machine Rs. 600 p.a.

Ans. Rs. 2.91 including Hire-purchase interest.

UNIT III
Lesson – 7
Single/Output/Unit Costing

Context of the lesson

This lesson deals with preparation of cost sheet and statement of cost. Cost sheet is used to ascertain the total cost and per unit of each item of expense and statement of cost is used to determine the total cost and cost per unit of the products manufactured. Output costing method is applied in industries where goods are produced on mass scale and goods are uniform.

Objective of the lesson

- To understand the concept of output costing.
- To know the meaning of meaning of cost sheet and statement of cost.
- Preparation of cost sheet and statement of cost.

Single/ Output costing method is a costing procedure, which is applied in those concerns which generally produce a single article or product or two or more grades of one product on mass scale by a common continuous process of manufacturing. The cost units are similar and identical. The products whose cost is to be ascertained are homogenous and are similar to each other.

DEFINITIONS OF UNIT OR OUTPUT COSTING

Herold J. Wheldon—"Production cost accounting or unit cost accounting is such a method of cost ascertainment which is based on production unit. It is applicable where the production work is done continuously and the units are of same types or manufactured identical."

Walter W. Bigg-—"Unit costing method is a method of costing applied to ascertain the cost unit or production where standard and identical products are manufactured."

J. R. Batliboi— "Single or output cost system is used in business where a standard product is turned out and it is desired to find out the cost of a basic unit of production.

The above definitions bring out the fact that single or output method of costing is used in those industries, where following characteristics are found:

(i) Production is uniform or homogeneous and a continuous affair;

(ii) The units of production is identical or similar;

(iii) The cost units are physical and natural;

(iv) Per unit cost has to be determined, for example per ton, per metre, per kg., etc.

Generally these characteristics are found in following industries—Coal mines, Sugar mills, Cloth mills, Flour mills, Cement factory, Brick kilns, breweries etc.

OBJECTIVES OF UNIT OR OUTPUT COSTING

The following are the main objectives of output costing method:

(i) To determine the total cost of production within specific period.

(ii) To classify cost under related categories

(iii) To have detailed analysis in order to determine per unit cost.

(iv) To determine the effect of each element of cost on total cost and to exercise control over cost.

(v) To determine tender price, estimated price or selling price of the product.

ELEMENTS OF COST UNDER UNIT OR OUTPUT COSTING

The various elements of cost under output costing for determination of cost of the products are:

Materials : The quantity and value of material consumed in manufacturing of the product is to be determined.

Labour : Direct labour has to be determined from the wage analysis sheet.

Direct Expenses: Other than material and labour various other expenses are also incurred on production which are directly related to production. These expenses are termed as direct expenses.

Overheads: The overheads are debited to production for the period for which the cost is being determined. These overheads expenses are taken from the financial records. There are certain expenses which cannot be determined before the end of the accounting period. For those expenses, an estimate is made in beginning of the year and are apportioned on appropriate basis. These overheads are the total of indirect material, indirect labour and indirect expense. In output costing, for in depth analysis of overheads, these are classified as Factory Overheads, Office or Administrative Overheads and Selling and Distribution Overheads.

SELF CHECK QUESTIONS

1. What is output costing method. In which industries is it applied
2. What are the objectives of application of Output costing method**.**

Determination of costing under output costing method

In order to determine cost of the product in industries where production is carried out on a continuous basis and on mass scale and where standard products are manufactured, generally the orgnaisation prepares:

- **Cost sheet**
- **Statement of Cost**
- **Production account**

Cost Sheet

In order to determine cost of the product under single or output costing method a cost sheet is prepared. Cost sheet is a document which provides for the assembly of the detailed cost centre or cost unit. It is a periodical statement of cost designed to show in detail the various elements of cost of goods produced, like prime cost, factory cost, cost of production and total cost.

DEFINITION OF COST SHEET

ICMA LONDON: “A Cost Sheet or Cost Statement is "a document which provides for the assembly of the detailed Cost of a Cost Centre or Cost Unit".

WHELDON: “Cost Sheet are prepared for the use of management and consequently they must include all the essential details which may assist the manager in judging the efficiency of production”.

W W Bigg, “The expenditure which has been incurred upon production for a period is extracted from the financial books and the store records set out in a memorandum statement. If this statement is confined to the disclosure of the cost of units produced during the period, it is termed as Cost Sheet." `

ADVANTAGES OF COST SHEET

The main advantages of a Cost Sheet are as follows:

1. It provides the information of total cost as well as cost per unit of production.

2. It helps in comparison of cost of different periods and products.

3. It helps in cost estimation required for submitting tenders.

4. It help in determination of selling price.

5. It facilitates cost control by disclosing operational efficiency.

6. lt acts as a guide to manufacture in formulation of suitable and definite policies.

STATEMENT OF COST

It is a statement which shows the total cost and the profit or loss. It is prepared when it is not desired to find out cost per item of expense. If from this statement the cost per unit has to be determined then it can be had by dividing the total cost by the number of units produced. In cost

sheet, per unit cost of each item of expenses is calculated whereas in statement of cost it is not done.

EXPLANATION OF VARIOUS TYPES OF COST APPEARING IN COST SHEET OR STATEMENT OF COST

(1) Prime Cost

Prime cost is the aggregate cost of direct material, direct labour and direct expenses.It is also known as 'Direct Cost, 'First Cost' or 'Flat Cost'.

Prime Cost = Direct Material + Direct Wages + Direct Expenses

(i) Direct Material : Direct material is that material which forms the major part of the product., e.g., timber in furniture making. Direct material refers to the amount of of direct material consumed which is worked out as under:

Opening Stock of Raw Material	.....
+ Purchase of Raw Material	.....
+ Carriage Inward or Freight	**.....**
— Closing Stock of Raw Material	..... ·
Raw Material Consumed	**XXX**

If any part of raw material is returned to the supplier or sold then its value is deducted in the above calculation.

(ii) Direct Wages or Labour : The wages paid to workers who are directly engaged in converting the shape of the raw material to finished product and whose time can be conveniently and economically be traceable to units of product or service is known as direct wages. It is also known as 'Productive wages'

(iii) Direct Expenses : These expenses are also called as 'Chargeable Expenses', or 'Productive Expenses'. These are expenses which are directly identified and incurred on a particular job or process.

(2) Factory Cost or Works Cost

The next stage after prime cost is factory cost. This cost is the sum of prime cost and factory overhead and can be expressed as:

Factory/Works Cost = Prime Cost + Factory Overheads

Factory overheads are of indirect nature and are incurred within factory premises or production process or in operating and controlling production activity. These expenses are also known as 'Manufacturing Overheads'. Some of the important items of factory overheads are as follows :

(i) Factory rent, rates and tax, (ii) Factory light, power, fuel etc., (iii) Loose tools and spares, (iv) Wages and salaries of factory employees, (v) Salary of Factory Manager, (vi) Remuneration of Technical Director, (vii) Depreciation, insurance and repairs of factory building, (viii) Depreciation, insurance and repairs of plant and machinery of factory, (ix) Store expenses, (x) Cotton waste, oil, lubricants, nut and bolts, (xi) Expenses on training of factory employees, (xii) Factory stationery and telephones,

(xiii) Employees welfare expenses, (xiv) Bonus to factory employees, (xv) Cost of idle time, (xvi) Research and development expenses, (xvii) Drawing office salary, (viii) Haulage, (xix) Cost of rectification of defective work, (xx) Removal of overburden, etc.

The presentation of factory cost in cost sheet can be shown as:	
Prime Cost	.....
Add : Factory Expenses	.....
Add : Opening Stock of Work-in-Progress	.....
Less : Closing Stock of Work-in-Progress	.....
Less : Sale of Scrap	.....
Works/Factory Cost	XXXX

(3) Office and Administration Cost

The sum of office and administrative expenses and factory cost, is known as office and administration cost. This cost is also known as Cost of Production. The expenses which are incurred in operating and controlling the business and on effective functioning and maintenance of business, policy creation and implementation are termed as office and administrative expenses. It includes :

(i) Rent, rates and tax of office building, (ii) Expenses on light and cleaning of office premises, (iii) Salaries & wages to office employees, (iv) Depreciation on office furniture, (v) Repair of office furniture, (vi) Repair of office building, (vii) Depreciation of office building, (viii) Insurance of office building and furniture, (ix) Salary of office manager and executives, (x) Expenses on printing and stationery, (xi) Postage, Telegram & Telephone, (xii) Expenses on business magazine, (xiii) Audit fee, (xiv) Bank charges, (xv) Legal expenses, (xvi) Counting office salaries, (xvii) Director's fees, (xviii) Other office and administration expenses.

(4) Total Cost

When selling and distribution expenses are added in cost of production, then the cost arrived is known as total cost. Selling expenses are those expenses which are incurred on creating or stimulating the demand of the product. Distribution expenses includes those expenses which are incurred in keeping the finished stock in godown and on delivering the goods to the customers godown. The following are some of the examples of selling and distribution overheads :

(i)Expenses of sales office, (ii) Salary, commission allowed to sales manager & sales representative, (iii) Travelling expenses of sales representative, (iv) Advertisement, (v) Bad debts, (vi) Price-list, samples & gifts, (vii) Discount allowed to customers, (viii) Legal expenses regarding sales, (ix) Stationery regarding sales, (x) Expenses on tender & estimates, (xi) Market research, (xii) Warehouse expenses, (xiii) Salary of wharehouse staff (xiv) Transit insurance of goods, (xv) Depreciation and maintenance expenses of delivery vans, (xvi) Carriage or freight of

sale of goods, (xvii) Theft or loss of goods in transit, (xviii) Reconditioning, repair and packing expenses of containers, etc.

SELF CHECK QUESTION

(1) What is a cost sheet.
(2) Explain cost sheet. How does it differ from statement of cost
(3) Discus the various stages of cost depicted in cost sheet
(4) What are the advantages of cost sheet.

Items excluded from cost sheet

The following items are of financial nature and thus not included with preparing a cost sheet.

(i) Cash discount ,(ii) Interest paid ,(iii) Preliminary expenses written off,(iv)Goodwill written off,(v)Provision for taxation,(vi)Provision for bad debts,(vii)Transfer to reserves,(viii)Donations,(ix)Income tax paid,(x)Dividend paid,(xi)Profit\loss on sale of assets,(xii)Damages payable at law etc.

TREATMENT OF ITEMS OF STOCK IN COST SHEET

Stock includes stock of raw materials, work-in-progress and finished goods. These item of stock are dealt in a specific manner while preparing a cost sheet.

Stock of Raw Materials:

Opening stock of raw material and closing stock of raw material are used to determine the cost of raw material consumed.

Opening stock of raw materials	———
Add: Purchase of raw materials	———
Less: Closing stock of raw materials	———
Value of raw materials consumed	XXX

Stock of Work-in-Progress:

Work-in-progress is valued at prime cost or works cost basis, but latter is preferred. lf it is valued at works or factory cost then opening and closing stock will be adjusted as follows :

Prime cost	———
Add: Factory overheads	———
Work-in-progress (beginning)	———
Less: Work-in-progress (closing)	———

Works cost	XXX

Stock of Finished Goods

Opening and closing stock of finished goods are adjusted before calculating cost of goods sold:

Cost of production	—
Add: Opening stock of finished goods	—
Less: Closing stock of finished goods	—
Cost of goods sold	XXX

NUMERICAL ILLUSTRATIONS

Illustration 1

From the following particulars of a colliery mine for the month of April 2009 prepare a cost sheet.

	Rs.	
Wages:	Underground	
15,000		
Surface		2,500
Working Expenses:		
Repairs and Renewals		600
Timber		350
Royalties and Way-leaves		500
Stable Expenses		150
Stores		200
Rent, Rates and Taxes		175
Depreciation		300
Administrative Expenses:		
General Administration, Selling and Distribution Charges	700	

Saleable Ton raised, 500 ton

Solution Colliery Cost Sheet

(for the month of April, 2009)

Particulars	**Total Cost**	**Cost per ton**
	Rs.	Rs.
Wages		
Wages underground Surface	15,000	30.00
Prime cost	2,500	5.00
Working Expenses	**17,500**	**35.00**
	600	
Repairs and Renewals	350	1.20
Timber	500	0.70
Royalties and Way-leaves	150	1.00
Stable Expenses	200	0.30
Stores	175	0.40
Rent, Rates and Taxes	300	0.35
Depreciation		0.60
Works Cost	**19.775**	**39.55**
Administrative Expenses :		
General Administration, Selling and Distribution Charges	700	1.40

Total cost	**20,475**	**40.95**

Illustration 2

Below is enumerated expenditure for a year in the manufacture of a product :

Raw Material	56,000	Rent (Factory)	4,000
Fuel	14,000	Tax & Insurance (Factory)	800
Electric Power	2,800	Depreciation on Machine	4,800
Process and General Wages	1, 26,000	Advertisement	1,000
Repairs	4,800	Salaries to Sales Agent	1,600
Carriage Inward	4,000	Carriages on Sales	400
Light & Water	800		
Office Salary	14,000		
Administrative Expenses (office)	10,000		
Units manufactured	40,000		

Prepare a cost sheet for the year showing cost per unit for each item of expenses and also the total cost of the production.

Solution

Cost sheet

(Output: 40,000 Units)

Particulars		**Total Cost**	**Cost per unit**
Raw Materials	56,000		
Add : Carriage Inward	4,000		
Cost of Material Consumed		60,000	1.50
Process & General Wages		1,26,000	3.15
	Prime Cost	**1,86,000**	**4.65**
Works Overheads			
Fuel		14,000	0.35
Electric Power		2,800	0.07
Repairs		4,800	0.12
Light & Water		800	0.02
Tax & Insurance		800	0.02

Depreciation on machine	4,800	0.12
Rent	4,000	0.10
Works Cost	**2,18,000**	**5.45**
Office Overheads:		
Office salary	14,000	0.35
Adm. Expenses	10,000	0.25
Office/Cost of Production	**2,42,000**	**6.05**
Selling & Distribution Overheads		
Advertisement	1,000	0.03
Salaries to Sales Agent	1,600	0.04
Carriage on Sales	400	0.01
Cost of Sales / Total Cost	**2,45,000**	**6.13**

Illustration 3

The following expenses are related to the production of 1,000 units during the month of August 2009:

Direct Material	12,000
Wages	10,000
Factory Rent & Taxes	1,000
Depreciation on Machinery	1,000
Supervisor's Salary	2,000
Indirect Material	500
Indirect Labour	300
Office Expenses	1,500
Other Factory Exp.	500
Office Salaries	1,800
Printing & Stationery	400
Selling Expenses	2,500

Prepare a cost sheet.

Solution:

Cost Sheet

(For the month of August 2009)

(Output: 1,000 units)

Particulars	**Total**	**Per Unit**
	Rs.	Rs.
Direct Material	12 000	12.00
Wages	10,000	10.00
Prime Cost	**22,000**	**22.00**
Factory Overheads :		
Factory Rent & Taxes	1,000	1.00
Depreciation on Machinery	1,000	1.00
Supervisor's Salary	2,000	2.00
Indirect Material	500	.50
Indirect Labour	300	0.30
Other Factory Expenses	500	0.50
Factory Cost	**27,300**	**27.30**
Office Overheads :		
Office Expenses	1,500	1.50

Office Salaries	1,800	1.80
Printing & Stationary	400	0.40
Office Cost or Cost of Production		
Selling overheads:		
Selling Expenses		
Total cost and cost of sales		
	31,000	**31.00**
	2,500	2.50
	33,500	**33.50**

Illustration 4

During march 2009, Thakkar Ltd had produced 5,000 units of motor parts . The following cost were incurred on its production:

Direct material	1,20,000	Office saleries	40,000
Direct labour	1,80,000	Sales salaries	60,000
Factory rent	30,000	Carriage outward	10,000
Office rent	20,000	Delivery van Exp.	15,000
Showroom rent	40,000	Depericiation on plant	25,000
Power	15,000	Crane expenses	20,000
Light	6,000	Depreciation on office exp.	5,000
Factory exp.	8,000	Direct factory exp.	40,000
Non productive wages	50,000	Counting house salary	6,000

Advertisement	50,000	Drawing office salary	8,000
Sales commission	20,000	Gas & water	3,000
Bad debts	9,000	Cash discount allowed	500
Manager's salary (2/3 factory,1/3 office)	15,000	Loose tools	400
Interest on capital	5,000	Sales	8,50,000
Estimating expenses	500	Haulage	1,000

Prepare a statement of cost sheet giving all details regarding various components of cost.

Solution

Statement of cost

(For the month of March)

Particular	**Cost**	**Total Cost**
Direct material	1,20,000	
Direct labour	1,80,000	
Direct factory expenses	40,000	
PRIME COST		3,40,000
FACTORY OVERHEADS OR WORK IN PRODUCTION	30,000	

Factory rent	15,000	
Power	8,000	
Factory expenses	50,000	
Non- productive wages	10,000	
Managers salary(2/3)	25,000	
Depreciation on plant	20,000	
Crane expenses	3,000	
Gas &water	400	
Losse tools	1,000	
Haulage	8,000	1,70,4000
Drawing office salaries		5,10,400
FACTORY COST		
OFFICE OVERHEADS	20,000	
Office rent	6,000	
Light	5,000	
Managers salary(1/3)	40,000	
Office salaries	5,000	
Depreciation on office equipment	6,000	
Counting house salaries		82,000
		5,92,400
COST OF PRODUCTION OR OFFICE COST		
SELLING &DISTRIBUTION OVERHEADS		
Estimating expenses	500	
Showroom rent	40,000	
Advertisement	50,000	
Sales commission	20,000	
Bad debts	9,000	
	60,000	

Sales salary	10,000	
Carriage outward	15,000	
Delivery van expenses		
COST OF SALES		
PROFIT		
SALES		2,04,500
		7,96,900
		53,100
		8,50,000

ILLUSTRATION 5

From the following information relating to the production of commodity 'X' you are required to ascertain:

(a) Value of material used, (b) cost of production (c) cost of sales (d) net profit and (e) profit per ton of commodity

	Rs.
Purchase of raw material	1,32,000
Carriage inward	1,580
Rent, rates &insurance of factory	44,000
Opening stock of raw materials	22,000
Opening stock of finished goods (800 tons)	17,600
Closing stock of raw materials	24,460
Closing stock of finished goods (1,600 tons)	35,200
Work in progress opening	5,280
Work in progress closing	17,600
Sale of finished products	3,30,000
Cost of factory supervision	8,800
Direct wages	1,10,000

Discount allowed advertisement and selling expenses amount to 75 paise per ton sold, 12,800 tons of commodity were produced during the period.

Solution **Statement of cost**

Particular		**Rs.**	**Rs.**
Opening stock of raw materials		22,000	
+ Purchase		1,32,000	
+ carriage inward		1,580	
		1,55,580	
- Closing stock of raw materials		24,460	
Value of material used			1,31,120
Direct wages			1,10,000
	PRIME COST		**2,41,120**
Work Overhead:			
Rent, rates, insurance, etc.		44,000	
Cost of factory supervision		8,800	
			52,800
+ Opening stock on work In progress			5,280
			2,99,200
-Closing stock of work in progress			17,600
	WORKS COST		**2,81,600**
Office Overhead:			-----
Cost of production	12,800		2,81,600
Add opening stockof finished goods	800		17,600
			2,99,200
13,600			35,200
Less closing stock of finished goods	1,600		2,64,000
Cost of goods sold	Tons		
12,000			
			9,000

Selling Overhead		2,73,000
Selling exp., advertising and discount etc.		57,000
@75 paisa per ton on 12,000 tons		3,30,000
Cost of Turnover or Sales		
Net Profit		
Sales of Finished Goods		

(a) Net profit per ton $\frac{57,000}{12,000} = \text{Rs. } 4.75$

Illustration 6

A company manufactures two types of pens namely 'Hero" & 'Raja'. Following are the details of cost for the year ended as on 31st march 2009:

Direct material	1, 30,000
Direct labour	1, 10,000
Production overheads	75,000

Following additional information is given:

I. The direct material in Raja pen was 40% of that in hero pen
II. The direct labour cost in Hero pen was twice as much as that in Raja pen.
III. Production overhead per pen was in the ratio of 5:3 (Hero: Raja)
IV. Administration overheads for each type of pen was 100% of direct labors cost.
V. Selling & distribution overheads were Re. 1 per pen.

Following was the production & sales of pen during year.

Particular	Production	Sales	Rates
Hero pens	20,000	18,000	@Rs.22.00
Raja pens	15,000	14,000	@Rs.14.00

Prepare a statement showing the cost details & profit per pen of each type.

Solution:

Particular	**Hero pens (20,000)**		**Raja Pens (15,000)**	
	Total	**Per pen**	**Total**	**Per pen**
Direct material	1,00,000.00	5.00	30,000.00	2.00
Direct labour	80,000.00	4.00	30,000.00	2.00
Prime cost	1,80,000.00	9.00	60,000.00	4.00

Production overheads	46,875.00	2.34375	28,125.00	1.875
Work cost	2,26,875.00	11.34375	88,125.00	7.875
Administration overhead	80,000.00	4.00	30,000.00	2.000
Cost of production	3,06,875.50	15.34375	1,10,250.00	7.875
Less ; closing stock	30.687.50	-	7,875.00	-
Cost of goods sold	2,76,187.50	15.34375	1,10,250.00	7.875
Selling &distribution overheads	18,000.00	1.00	14,000.00	1.00
Cost of sales	2,94,187.50	16.34375	1,24,250.00	8.875
Profit	1,01,812.50	5.65625	71,750.00	5.125
Sales	3,96,000.00	22.00	1,96,00.00	14.00

Illustration 7

The following figures are collected from the books of Iron Foundry after the close of the year:

Raw Material

- Opening stock in the beginning of the year 7,000
- Purchase during the year 50,000
- Closing stock at the end of the year 5,000
- Direct wages 10,000

- Works overhead -50% of direct wages
- Store overhead on cost of material consumed 10%
- 10% of the casting were rejected being not upto specification and a sun of Rs. 400 was realised on sale as scrap.
- 10% of the finished casting were found to be defective in manufacture and were rectified by expenditure of additional work to overhead charged to the extent of 20% on the proportionate direct wages.
- The total gross output of casting during the year 1000 ton

Find out the manufacturing cost of the saleable per ton.

Solution

Particular		Quantity in ton	Amount
Opening stock of raw material	7,000		
Add: Purchases during the year	50,000		
	57,000		
Less : closing stock of raw materials	5,000		
Raw material consumed			52,000
Direct wages			10,000
Prime cost			62,000
Work overhead (50% of direct wages)			5,000
Stores overhead (10% on the cost materials consumed)			5,200
		1,000	72,200
Total cost of gross output		100	400
Less: sale of rejected casting		900	71,800
Cost of finished casting			
Additional work overhead			
Cost of rectifying 10% of the finished casting found defective to the extent of 20% of the proportionate direct wages			180*
Manufacturing cost a saleable casting :			
(per ton Rs. 79.98 of 80 per ton appox.)		900	71,980

* 10% of finished casting in 90 ton. These 90 ton have been rectified by increasing works overhead to the tune of 20% of the proportionate direct wages i.e,

$$Rs.10{,}000 \times 20\% \times \frac{90}{1{,}000} = Rs.180$$

SELF CHECK QUESTION

1. What are the characteristics features of Unit Costing?
2. What is Output Costing? To what types of concerns is this method suitable?
3. What are Cost Sheets? What are their advantages? How do they differ from Cost Accounts?
4. What is a Cost Sheet and why is it prepared? Prepare a cost sheet with imaginary figures.
5. Define Cost Sheet? How does Cost Sheet differ from Cost Statements?

PRACTICAL QUESTIONS

1. Following data has been drawn from the records of Centre Corporation for the period from Jan. 1 to Jan. 31,2005.

	2005 1st Jan.	**2005 31st Jan.**
Cost of raw materials	60,000	50,000
Cost of work-in progress	24,000	30,000
Cost of finished goods	1,20,000	1,10,000
Transaction during the month		
Purchase of raw materials		90,000
Wages paid		4,60,000
Factory Overheads		1,84,000
Administration Overheads		60,000
Selling overheads		40,000
Sales		18,00,000

Draft the cost sheet.

ANS. PRIME COST RS. 13,70,000, WORKS COST RS.15,48,000,COST OF PRODUCTION RS. 16,08,000, COST OF GOODS SOLD RS. 16,18,000; COST OF SALES RS.16,58,000

2. From the following information extracted from the records of the M/s Sundaram &Co. The stock position of the firm is:

Particulars	**Rs. 1-4-1994**	**Rs. 31-3-1995**
Stock of raw materials	80,000	1,00,000
Stock of fininshed goods	2,00,000	3,00,000
Stock of work-in-progress	20,000	28,000

Particulars	**Rs.**	**Particulars**	**Rs.**
Indirect labour	1,00,000	Administartive expenses	2,00,000
Oil	20,000	Electricity	60,000

Insurance on fixtures	6,000	Direct labour	6,00,000
Purchase of raw materials	8,00,000	Depreciation on Machinery	1,00,000
Sale of Commission	1,20,000	Factory rent	1,20,000
Salaries of Salesmen	2,00,000	Property tax on building	22,000
Carriage outward	40,000	Sales	24,00,000

Prepare cost statement of M\s Sundaram & Co.

3. Mr.Anand provides the following information which is related to the product of his enterprise for the month of December 1995.

Particular	**Rs.**
Raw materials consumed	30,000
Direct labour charges	18,000
Machine hours worked	1,800
Machine hour rate	10
Administrative overheads	20% on works cost
Selling overheads	Re.1 per unit
Units produced	26,400 units
Units sold	25,000 units Rs.8 per unit

Draft the cost statement and determine the cost per unit, profit per unit sold and profit during the period.

4. Prepare the cost sheet to show the total cost of production and cost per unit of goods manufactured by a company for the month of january,2005.Also find the cost of sale and profit.

Particulars	**Rs.**	**Particulars**	**Rs.**
Stock of raw materials 1.1.2005	6,000	Factory rent and rates	6,000
Raw materials procured	56,000	Office rent	1,000
Stock of raw materials 31.1.2005	9,000	General expenses	800

Direct wages	14,000	Discount on sales	600
Plant depreciation	3,000	Advertisement expenses	1,200
Loss on the sale of plant	600	Income tax paid	2,000
Sale RS.	1,00,000		

5. From the following information,prepare the balance sheet from the cost records of Aditya Chemicals Ltd. For 2009

Particulars	**Rs.**
Finished goods on 1-1-2009	50,000
Raw material on 1-1-2009	10,000
Work in progress	14,000
Direct labour	1,60,000
Purchase of raw material	98,000
Indirect labour	40,000
Heat,light and power	20,000
Factory,insurance and Taxes	5,000
Repairs to plant	3,000
Factory Supplies	5,000
Depreciation-factory building	6,000
Depreciation-plant	10,000
Factory cost of goods produced in 2009	2,80,000
Raw materials consumed in 2009	95,000
Cost of goods sold in 2009	1,60,000

No office and administration expenses were incurred during the year 2009.Prepare a statement of cost for the year ending 2009 giving maximum possible information and its break up.

6. The pen manufacturing company is producing two types of pen – Deluxe and popular. The manufacturing costs of the year ended 31st march 2008 were:

Particular	Amount
Direct material	2,00,000
Direct wages	1,12,000

Production overhead	48,000

It is ascertained that:

(i) Direct materials in Deluxe type cost twice as much as that of Popular type.
(ii) Direct wages of Popular type were 60 percent of those for Deluxe type.
(iii) Production was 30 paise per pen for both types.
(iv) Administration overhead for each type was 200 per cent of direct labour.
(v) Selling cost was 25 paise per pen for both the types.
(vi) Production during the year was:

Deluxe type – 40,000 pens of which 36,000 were sold.
Popular type – 1,20,000 pens of which 1,00,000 were sold.

(vii) Selling prices were Rs. 7 per pen of Deluxe type and Rs. 5 per pen of Popular type.Prepare a statement showing the total cost per pen of each type and the profit made on each type.

Ans: cost per pen deluxe: Rs. 5.55; Popular Rs. 3.35; Profit per pen Rs. 1.45 and Rs.1.65 respectively

7. A manufactures Stools, chairs and tables. The material and wages costs are separated as follows:

Particular	**Stool**	**Chair**	**Table**
Material of each	3.6	6.00	44.00
Wages of each	4.8	4.00	12.00
Productions(units)	6,000	3,000	600

Total factory overhead Rs. 60,000

You are requested to determine the works cost of each type of furniture after assuming that one table is equivalent to four stool and two chair are equivalent to one table for the purpose of factory overhead allocation.

Ans.

	Stool	**Chair**	**Table**
Works cost	75,400	55,000	43,600
Ratio of factory overhead	5:	5:	2

LESSON 8
TENDER PRICE

CONTEXT OF THE LESSON

This lesson deals with preparation of tender price where price is to be quoted for producing certain article or product. The tender price is quoted considering the cost of the work to be done in future and by adding a certain margin of profit to the cost. In order to determine the total estimated cost, a manufacturer considers his past experience and past cost and also in addition, pays significant attention and consideration to the possible changes in past cost (increase or decrease) in future

OBJECTIVE OF THE LESSON

To understand the meaning of tender, estimate and quotation

To deal with preparation of tender price

INTRODUCTION

Cost accounting helps in estimating the cost of job or order or service in advance. A producer or a manufacturer may be required to supply in advance the tender price of a particular job or order to a customer. This tender price is generally quoted by considering the estimated cost of the work to be performed in future and by adding a certain margin of profit to the cost. To ascertain the total estimated cost, a manufacturer not only considers his past experience and cost but also pays significant consideration to the possible changes or fluctuation in the various elements of cost (increase or decrease) which may likely take place in future. In order to quote an accurate tender price, each element of cost of production should be carefully analyzed individually and all indirect expenses or overheads should be classified into fixed, variable and semi-variable expenses for the purpose of detail analysis. Tender price, estimated price or quotation price should be determined carefully so as to be competitive. In brief the above three prices can be explained as follows:

(1) **Tender Price**: A formal statement of price, at which the goods are agreed to be supplied or work order is to be executed, which is sent in reply to an invitation is called tender. This term is generally used in governmental transactions.

(2) **Quotation Price**: A statement of price that is quoted for a work order to be executed or service to be rendered or goods to be supplied is called a “Quotation”. This term is generally used in other than government transactions.

(3) **Estimation Price**: An approximate price of` a work order or goods or service, calculated on the basis of general opinion and judgment is called 'Estimation'. While preparing estimation price, the general work, views, opinions and personal judgments plays significant role. As a result, the price so stated, would only be an approximate price.

In order to calculate Tender price or estimated price the following costs are taken into consideration:

(a) Cost of Direct Material

(b) Cost of Direct Labour.

(c) Cost of Direct Expenses.

(d) Share of Factory Overhead.

(e) Share of Office & Administrative Overhead.

(f) Share of Selling and Distribution Overhead.

(g) Desired percentage of Profit.

In this way, tender price can be expressed as under:

Tender Price = Cost + Profit

DETERMINATION OF TENDER PRICE

Following points should be taken into consideration while determining a tender price:

(1) The quantity or units to be produced for which the tender price is to be quoted. In this regard it should also be observed as to what change will be there in overheads which can be further classified as fixed, variable and semi-variable. These changes should also be analyzed considering whether there will be any change in size and type of product or units required.

(2) Past accounting records should be taken into consideration to know the previous cost. If there is a change in the price of material, labour and expenses, it should accordingly be adjusted in the tender price.

(3) Where per unit tender price has to be quoted, cost sheet is very helpful in this job as whatever change has been there in any element of cost can be easily adjusted.

(4) Where a quotation is to be given for a job, then after determining the cost of direct material and direct labour, overheads can be determined by charging it on a certain percentage to a relevant basis and thus total cost can be determined whereby a certain percentage of profit can be added.

(5) In order to determine tender price, a statement of cost is prepared where adjustment are made in material, labour and overheads for prospect changes in price.

(6) For determining the tender price care should be taken whether the profit percentage to be included in the tender is to be calculated on the basis of cost price or the selling price.

Illustration 1

The following figures relate to the costing of a Tarpaulin manufactured in respect of a certain type of a sheet for a period of three months:

Particular	Amount
Stock of Materials 1st January	5,500
Stock of Materials 31st March	3,500
Factory Wages	83,000
Materials Purchased	61,500
Sales	1,41,500
Indirect expenses	13,000
Finished stock,1st January	Nil
Finished stock ,31st March	29,000

The number of sheets manufactured during three months was 2,200 and the price is to be quoted for 648 sheets in order to realize the same percentage of profit as for the period under review, assuming no alteration in rates of wages and cost of materials. Prepare a statement of cost for the manufacture of 2,200 sheets and quotation for 648 sheets.

Solution:

Statement of Cost

(For the period ending 31st March, 20…)

Particulars	Total Cost of 2,200 Tarpaulin sheets Rs.	Cost per Tarpaulin sheet Rs.
Materials Consumed:		
Opening of Materials	5,500	
Purchase of Materials	61,500	
	67,000	
Less: Closing stock of materials	3,500	
Materials Consumed	63,500	28.86
Factory wages	83,000	37.73

Particular	Amount
Opening stock of Raw Materials	10,000
Closing stock of Raw Materials	5,000
Purchase of Raw Materials	15,000
Factory Expenses	10,000
Opening stock of Finished Goods	5,000
Sales	72,500
Factory wages	30,000
Office expenses	10,000
Closing stock of Finished goods	12,000

Prime cost	1,46,500	66.59
Indirect expenses	13,000	5.91
Cost of production	1,59,500	72.50
Less: Closing stock of Finished Goods	29,000	
Cost of goods sold	1,30,500	
Profit	11,000	
Sales	1,41,500	

$$\text{Percentage of profit on Cost} = \frac{11{,}000 \times 100}{1{,}30{,}500} = 8.429 = 8.43\%$$

Quotation for 648 Sheets

Illustration 2

From the following data, prepare a cost and profit statement of Popular Stove Manufacturing Company for the year 2008:

500 stoves were manufactured during the year 2008.Company has to quote for the supply of 2,000 stoves in 2009.The proposed stoves are of uniform quality and make and similar to those manufactured in the previous year, but the cost of materials has increased by 15% and the cost of factory labour has increased by 10%.The same percentage of profit on cost as realized during 2008 has to be earned. Assuming that the cost per unit of overheads remains the same as in previous year, prepare a statement showing quotation price.

Solution:Statement of Cost and Profit

(For the year 2008)

(500 stoves)

Particulars	Total	Per stove
Opening stock of Raw Materials	10,000	
Add: Purchase of Raw Materials	15,000	
	25,000	
Less: Closing of Raw Materials	5,000	
Materials Consumed	20,000	
Factory wages	30,000	
Prime cost	50,000	
Factory expenses	10,000	
Factory cost	60,000	
Office expenses	10,000	
Cost of production	70,000	
Add: Opening stock of finished goods	5,000	
	75,000	
Less: Closing stock of finished goods	12,000	
Cost of goods sold		
Profit	63,000	
Sales	9,450	
	72,450	

Percentage of profit on cost $= \frac{9{,}450 \times 100}{63{,}000} = 15\%$

Statement showing Quotation price for 2,000 Stoves

Materials @ Rs. 40 per stove	80,000	
Add: Increase 15%	12,000	
		92,000
Factory wages @ Rs. 60 per stove	1,20,000	
Add: Increase 10%	12,000	1,32,000

Prime cost		2,24,000
Factory expenses@ Rs.20 per stov		40,000
Factory cost		2,64,000
Office expenses @ Rs.20 per stove		40,000
Cost of production		3,04,000
Profit 15% on Cost =3,04,000 X 15 / 100		45,600
Quotation Price		3,49,600

$$\text{Quotation price per unit} = \frac{3{,}49{,}600}{2{,}000} = \text{Rs. } 174.80$$

Illustration 3

The following is the summarized Profit & Loss Account of Rajasthan Electric Company for the half-year ending 30th June,2007.1,600 electric fans were manufactured and sold by the company during the half-year:

Profit & Loss Account

(For the half-year ending 30th June, 2007)

	Rs.		Rs.
To Materials Consumed	64,000	By Sales	3,20,000
To Wages	96,000		
To Manufacturing Expenses	40,000		
To Gross Profit c\d	1,20,000		
	3,20,000		3,20,000

Office Salaries	48,000	By Gross Profit	1,20,000
Rent & Taxes	8,000		
Selling Expenses	16,000		
General Expenses	24,000		
Net profit	24,000		
	1,20,000		1,20,000

The following estimates were made by the costing department of the company for the next half-year ending 31st, Dec, 2007.

(a) The output and sales will be 2,000 electric fans.
(b) The price of materials will rise by 25% on the previous half-year's level.
(c) Wages during this period will rise by 12 1\2 %.
(d) Manufacturing expenses will rise in proportion to the combined cost of materials and wages.
(e) Selling expenses per unit will remain unchanged.
(f) Other expenses will remain unaffected by the rise in output.

Prepare a statement showing the price at which each electric fan would be sold so as to ensure a net profit of 10% on the cost price.

Solution: **Cost Sheet**

(For the half-year ending 30th June, 2007)

(1,600 Electric Fans)

Particulars	**Total Cost**	**Per Fan**
	Rs.	Rs.
Cost of Materials used	64,000	40.00
Wages	96,000	60.00

Prime cost	1,60,000	100.00
Manufacturing Expenses	40,000	25.00
Works cost	2,00,000	125.00
Office & General Expenses:		
• Office Salaries	48,000	30.00
• Rent & Rates	8,000	5.00
• General Expenses	24,000	15.00
Cost of Production	2,80,000	175.00
Selling Expenses	16,000	10.00
Cost of Sales	2,96,000	185.00
Profit	24,000	15.00
Sales	3,20,000	200.00

Statement of Estimate
(For the next half-year ending 31st Dec., 2007)
(Output 2,000 fans)

Particulars		**Total Cost Rs.**	**Per fan Rs.**
Materials (2,000 X Rs.40)	80,000		
Add:25% rise	20,000	1,00,000	50.00
Wages (2000 X Rs.60)		1,35,000	67.50
1,20,000			
Add:12 1\2 % rise		2,35,000	117.50
15,000			
Prime cost		58,750	29.375
Manufacturing Expenses			
(40,000 X 2,35,000)		2,93,750	146.875
1,60,000			
Works cost		80,000	40.00

Office & General Expenses	3,73,750	186.875
(Same in total as in previous period(48,000+8,000+24,000)	20,000	10.00
	3,93,750	196.875
	39,375	19.687
Cost of production		
Selling Expenses Rs.10 per unit		
Cost of Sales		
Profit(10% on cost)		
Sales Price	4,33,125	216.562

Note: It has been stated in the question that manufacturing expenses will rise in proportion to the combined cost of materials and wages, which means in the proportion of Prime cost. That is why it has been calculated directly on Prime cost. Alternatively it can be calculated as follows:

$$\%\ \text{of Manufactuirng Expenses on Prime Cost} = \frac{40{,}000}{1{,}60{,}000} = 25\%$$

$$\text{Hence, Manufacturing Expenses} = \frac{2{,}35{,}000 \times 25}{100} = \text{Rs. } 58{,}750$$

Illustration 4:

A manufacturer of Scooter finds that in the year 2006 it costs him Rs.6,16,000 to manufacture 200 scooters which he solds at Rs.4,000 each. The cost was made up:

Materials	2,00,000
Direct Labour	3,00,000
Factory Overheads	60,000
Office Overheads	56,000

For the year 2007 his estimates are:

(i)That each scooter will require materials to the value of Rs.1,000 and an expenditure on wages Rs.1,500.

(ii) That factory overheads expenses will bear the same relation to direct wages as in the previous year.

(iii) That the percentage of factory overheads on factory cost will be the same as in the previous year.

Prepare a statement showing the profit he should make if he increases the price of the scooter by Rs.80.

Solution:Statement of Cost (for 2006)

		Rs.
Materials		2,00,000
Direct Wages		3,00,000
Prime Cost		5,00,000
	Factory Overheads	60,000
Factory Cost		5,60,000
	Office Overheads	56,000
Total Cost		6,16,000

(i)Percentage of Factory Overheads on Wages:

$$\frac{60{,}000 \times 100}{3{,}00{,}000} = 20\%$$

(ii) Percentage of Office Overheads on Factory Cost:

$$\frac{56{,}000 \times 100}{56{,}000} = 10\%$$

Statement of profit (for 2007)

		Rs
Materials		1,000
Direct Wages		1,500
Prime Cost		2,500
	Factory Overheads (20% of Wages)	300
	Factory Cost	2,800
Office Overheads (10% of Factory Cost)		280

Total Cost	3,080
Profit (Bal. Fig.)	1,000
Increase Selling Price(4,000+80)	4,080

SELF CHECK QUESTION

1. Define a cost sheet and explain how a cost sheet helps in finding out tender price. Elucidate with the help of an example.

PRACTICAL QUESTION

1. The following figures relate to the costing of a manufacturer of electric fans for a period of 3 months ending 31st Dec., 2006.

Completed stock on 1st Oct., 2006	Nil
Competed stock on 31st Dec., 2006	20,250
Stock of raw materials 1st Oct., 2006	5,000
Stock of raw materials 31st Dec.,2006	3,500
Factory wages	75,000
Indirect charges	12,500
Materials purchased	32,500
Sales	1,12,500

The number of fans manufactured during the 3 months was 3,000.Prepare a statement showing the cost per fan and the price to be quoted for 750 fans to realise the same percentage of profit as was realized during the three months.

Ans. Cost per fan Rs.40.50; Quotation for 750 fans Rs.33, 750.

2. The following in formations are extracted from the books of a Blanket manufacturer who intends to quote for the supply of 5,000 Blankets. Prepare a statement showing what price he should quote so that he may get the same percentage of net profit on turnover which he got during the last year for which the particulars are given:

Stock of materials on 1st April, 2006	1,00,000
Material purchased during the year	1,50,000

Factory Wages	3,00,000
Indirect Expenses	50,000
Sales	5,40,000
Stock of Materials,31st March,2007	14,000
Completed stock in hand on 1st April, 2006	Nil
Completed stock in hand on (2,047 Nos. of Blankets)	1,00,000
Output during the year (Blankets)	12,000

Provision has to be made in the estimate for the expected increase of 10% in the cost of factory labour and 5% in the material cost.

Ans. Tender price Rs.2,92,963. (if it is assumed that indirect expenses are based on factory wages, i.e. 16.67%),Rs.2,90,672(if it is assumed that indirect expenses are fixed per unit.

3 .Crystal Cold Private Limited manufactured and sold 200 Fan coolers in the year ending 31st March, 2007.The summarized Trading and Profit and Loss Account is given below.

	Rs.		Rs.
Cost of Materials	16,000	Sales	80,000
Direct Wages	24,000		
Factory Expenses	10,000		
Gross Profit	30,000		
	80,000		80,000
Management and staff salaries		Gross Profit	30,000
Rent, Rates and Insurance	12,000		
Selling Expenses	2,000		
General Expenses	8,000		
Net Profit	6,000		
	2,000		
	30,000		30,000

For the year ending 31st March, 2008 it is estimated that:

(a) Output and sales will be 300 Fan coolers.
(b) Price of Raw Materials will rise by 25% on the previous level.
(c) Wages will rise by 10%
(d) Factory on cost will rise in proportion to the combined cost of materials and wages.
(e) Selling on cost per unit will remain unchanged.

(f) Rent, Rates and Insurance will be reduced by 25% per unit.
(g) Other expenses will remain unaffected by rise in output.

You are required to submit a statement for the board of Directors showing the price at which the Fan coolers should be quoted so as to show a profit of 20% on the selling price.

Ans. Year Prime cost Work cost Cost of production Total cost

31.3.07(Rs.) 40,000 50,000 70,000 78,000

31.3.08(Rs.) 69 ,600 87,000 1,07,250 1,19,250

Total Selling Price (31.3.08) =Rs.1,49,062.50

Selling Price per fan =Rs.496.87.

4. The accounts of Saraf Co.Ltd. show the following information for the year 31st March, 2007:

Materials used	70,000
Direct Wages	54,000
Works Overheads	16,200
Establishment and General Expenses	11,216

Calculate:

(1)Works cost;

(2)Total cost of manufacture:

(3)The percentage that works overheads bear to direct wages:

(4) Establishment and General Expenses as percentage work cost.

What price should the company quote to manufacture a machine which, it is estimated, will require an expenditure of Rs.720 on materials and Rs.600 on wages so that it will yield a profit of 15% on the total cost.

Ans.(1)Rs.1,40,200 (2)Rs.1,51,416,(3) 30%,(4)8%,Quotation price for a machine Rs.1,863.

5. The under-mentioned figures have been collected from the books of a company.

Cost of materialRs.4,00,000, Cost of labour Rs.3,00,000, Factory Charges Rs.1,50,000, Administration Charges Rs.1,70,000, Selling Charges Rs.42,500, Distribution Charges Rs.42,500.

On the basis of the above figures, a work-order has been executed and the following expenses have been incurred thereon:

Materials Rs.10,000, Labour Rs. 6,000

Factory overheads are based on Direct Wages, Administration, Selling and Distribution charges are based on factory cost. Assuming that the factory overheads have gone up by 10% and other overheads

expenses maintaining the same percentages and the profit charged is 20% 0n total cost, find the total price of the work-order .

Ans . Prime cost Rs,7,00,000;Factory cost Rs.8,50,000;Cost of production Rs.10,20,000;Total cost Rs.11,05,000;Percentage of factory overheads on Direct wages 50%;Percentage of Administration Expenses 20%, Selling Expenses 5%,Distribution Expenses 5% on works cost; Quotation price Rs.30,108.

6. The Managing Director of a Company consults you as to the minimum price at which he can sell the output of one of the department of the company which is intended to go for mass production in future. The company's records show the following particulars for this department for last year:

Particular	**Amount**
Production & Sales	100 units
Materials	7,500
Direct Wages	5,000
Direct Expenses	5,000
Factory Overheads	2,500
Office Overheads	1,200
Selling Expenses	8,00
Profit	2,500
	20,000

It is ascertained from the records that 70% of factory overheads fluctuate directly with production and 50% of selling expenses fluctuate with sales. Direct wages per unit will be reduced by 30% while fixed factory overheads will increase by 1,000.Office overheads and fixed selling expenses are expected to show an increase of 25%.Besides there, no other changes are anticipated.

It is expected that the department would produce and sell 1,500 units per annum. Prepare a statement for submission to your client.

Ans. Total Sales Value Rs.2,38,285;Selling price per unit 158.86 after charging the same rate of profit as last year. Material per unit Rs. 75; Direct wages per unit Rs.35;Factory overheads-Fixed Rs. 1,750(750+1,000),Variable factory overheads per unit Rs.17.50;Office overheads total Rs.1200+300=Rs. 1,500,Selling expenses Fixed Rs.400+100=Rs 500,Variable selling expenses per unit Rs 4.

LESSON 9
RECONCILIATION STATEMENTS

CONTEXT OF THE LESSON:

Through this lesson we will understand why there is difference in the profit disclosed by the financial books of accounts and cost accounts. Further the lesson will focus upon the procedure of reconciliation of profits of the two sets of books of accounts.

OBJECTIVES OF THE LESSON

1. Meaning of reconciliation statement.
2. Necessity of reconciliation
3. Reason for disagreement among the profits of cost account and financial accounts.
4. To deal with practical problem.

INTRODUCTION

The objective of financial accounts is to ascertain the profit or loss of the concern as whole for the accounting period under review and also to determine the financial position of the concern at the end of the financial year. The financial accounts deals with the recording, classification and summarization of business transaction of the concern and ends up with preparation of final statements viz. profit and loss accounts and balance sheet for the accounting period.

Cost accounting on the other hand deals with the ascertainment of cost of product, absorption of overheads into product cost and determination of profitability on either segment wise or division wise or product wise etc,.

Different sets of books of accounts are maintained under both the branch of accounting i.e. financial accounting and cost accounting. Furthermore, both the accounting system follows to some extent different sets of accounting principles, methods and approaches and practices. The maintenance of different sets of books of accounts with different objects results in depicting different results as regards to profit or loss in cost accounts and financial accounts. Therefore, it highly necessitates for the reconciliation of the two set of accounts periodically and preparation of a statement of reconciliation to show the reasons or causes for difference in profit or loss as shown by cost and financial accounts.

NECESSITY FOR RECONCILIATION:

The various reasons which necessiates for carrying out the process of reconciliation of cost and financial accounts are as follows: -

- The major reasons for difference in profit or loss in cost accounts and financial accounts is traced and analysed. These reasons for deviations can be further used for controlling and managing efficiently the various operations.
- The accuracy of cost accounting methods, techniques and approaches adopted by the concern can be verified with the financial accounts. For e.g. methods of absorption of overheads, basis of providing depreciation allowance, inventory valuation etc.
- The reliability of cost accounting data and financial accounting data is verified by reconciling both the accounts.
- The process of reconciliation helps in standardization of various accounting policies.
- It helps to establish co- ordination and co-operation between financial and costing department in generating accurate and reliable accounting data to fulfill the statutory requirement and for taking various managerial decisions.
- It helps the management in identification of reasons for deviation in profit between costs accounts and financial accounts for internal control and efficient management of operations.

REASONS FOR DISAGREEMENT

The difference in profit or loss ascertained in cost accounts and financial accounts is due to the following reasons

(I) Items only shown in financial account and which does not appear in cost accounts: There are certain items of expenses and income which are of purely financial in nature. These items are not shown in the books of cost accounts as a result the profit and loss as shown by financial sets of books of account varies. These items are:

(a) Profit or loss on sale of fixed assets

(b) Discounts on issue of redemption of shares and debenture.

(c) Capital issue expenses

(d) Preliminary expenses written off

(e) Receipts of interest and dividend on investment

(f) Cash discount and bad debts.

(g) Miscellaneous income or expenditure not relating to business.

(h) Distribution of dividends

(i) Payment of income tax

(j) Donations

(k) Transfer of profits to reserves

(l) Goodwill written off

(m) Expenses relating to previous year

(n) Profit or loss relating to transactions of abnormal or non- recurring nature

(o) Lay off wages and retrenchment compensation.

(II) Items only shown in cost accounts which do not appear in financial accounts: There are certain items which do not appear in the financial sets of books of account but are taken into consideration in cost books for taking any managerial decisions. These are:

(a) Notional rent on premises owned

(b) Notional rent on capital.

(III) Disagreement due to under or over absorption of overhead items: In financial accounts the overheads are recorded on actual basis. However, in cost accounts for ascertainment of cost of the product or cost unit estimated overheads are taken into consideration. These overheads are predetermined overheads absorption rates like machine hour rate, direct labour hour rate, percentage of direct material, direct material, direct labour, prime cost, factory overhead, etc. are used for over absorption of overheads. Hence, the absorption of overheads in cost accounts may be under or over recovered than the actual overheads incurred.

(IV) Change in the method of stock valuation:

(a) In financial accounts, the stocks of raw material are valued at cost or market price whichever is lower. However in cost accounts stock may be valued under FIFO, LIFO, simple average methods, etc.

(b) The finished goods are valued under absorption costing method in financial accounts. In preparation of cost account, the stocks may be valued under absorption costing, marginal costing, and standard costing.

(V) Difference due to use of different rates of depreciation:

In financial accounts the amount of depreciation is charged as par the rates given in the Companies Act, 1956, but in cost accounts, appreciation and suitable method is used for calculation of the amount of depreciation.

SELF CHECK QUESTION

1. What do you understand by reconciliation statement

2. What is the necessity for reconciliation of profit as shown by financial accounts and cost accounts?
3. Explain the causes of difference among the profits as shown by financial and cost books.

METHOD OF PREPARING RECONCILATION STATEMENT

In order to prepare a reconciliation statement, profit shown by any one set of accounts can be taken as base and items of difference are either added to it or deducted from it to arrive at the figure shown by other set of accounts:

PARTICULARS	**AMOUNT**	**AMOUNT**
Profit/Loss as per Cost Accounts		XXX
Add: Income Not Considered In Cost Accounts		
• Trading profit	XXX	
• Profit from other activities	XXX	
• Income from investment	XXX	
• Income relating to previous years	XXX	
• Profit on sale of investment	XXX	
• Profit on sale of raw material	XXX	
• Abnormal/Non-recurring income	XXX	XXX
Less: Expenses not considered/short considered in cost account		
• Abnormal losses	XXX	
• Expenses relating to previous years	XXX	
• Lay off wages	XXX	
• Retrenchment compensation	XXX	
• Difference in depreciation, if any	XXX	
• Delayed payment charges for power bill	XXX	
Add/less: Difference in opening and closing stocks as per financial accounts and cost accounts		XXX
Finished goods stock		XXX
Work in progress		XXX
		XXX
Profit (loss) as per Financial Accounts		XXX

Memorandum Reconciliation Account: It is an account not being a part of double entry system of book keeping. It is simply a method by which a record can be difference in cost account and financial accounts, in order to show by their respective profit figures are different. The debit and credit of normal account will not apply in preparation of memorandum reconciliation accounts. In this statement profit under one set of accounts is taken as opening balance and all items of difference required to be deducted are debited and those to be added are credited to this account. The balancing figure of this account is the profit shown by other set of accounts.

PERFORMA MEMORANDUM RECONCILIATION A/c

Particulars	Amount	Particulars	Amount
To Under absorption of overheads in cost accounts		By profit as per cost accounts	XXX
To under valuation of opening stock in cost accounts	XXX	By over absorption of overheads in cost accounts	XXX
To over valuation of closing stock in cost accounts	XXX	By items only charged in cost accounts	
To items only charged in financial accounts		• Interest on own capital	XXX
• Brokerage	XXX	• Rent on own building	XXX
• Underwriting commission	XXX	By over valuation of opening stock in cost accounts	XXX
• Donation	XXX	By under valuation of closing stock in cost accounts	XXX
• Income tax	XXX	By incomes received only credited in financial accounts	XXX
• Goodwill written off	XXX		
• Preliminary expenses	XXX	Interest, rent , dividend received	XXX
• Written off	XXX		
• Discount on issue of redemption of share	XXX	By profit on sale of assets credited in financial accounts	XXX
To net profit as per financial accounts	XXX		
	XXX		

Illustration 1

The net profit of the Bharat Company Pvt. Ltd was Rs. 1, 28,755 as per financial record for the year ended 31st December 2008. The cost books however showed a net profit of Rs. 1, 72,400

for the same period. A scrutiny of the figure from both the sets of accounts revealed the following facts:-

- Works overheads under-recovered in cost 3,120
- Administration overheads recovered in excess 1,700
- Depreciation recovered in cost 12,500
- Depreciation charged in financial accounts 11,200
- Interest on investment not included in cost 8,000
- Loss due to obsolescence in financial accounts 5,700
- Income tax provided in financial accounts 40,300
- Bank interest and transfer fees(in financial books) 750
- Stores adjustments (credited in financial books) 475
- Loss due to depreciation in stock values (charged in financial account) 6,750

You are required to prepare a Reconciliation statement to reconcile both the figure of the net profits. Also show the memorandum Reconciliation Account

Reconciliation Account

Particular		Rs.	Rs.
Profit as per Cost Account			1,72,400
Add:-			
Administration overheads recovered in excess		1,700	
Depreciation recovered in cost	12,500		
Depreciation charged in financial accounts	11,200	1,300	
Interest on investment not charged in cost accounts		8,000	
Bank interest and transfer fees not charged in cost accounts		750	
Stores adjustments (credit in financial books)		475	12,225
			1,84,625
Less:			
Works overheads under-recovered in cost		3,120	
Loss due to obsolescence		5,700	
Income tax		40,300	
Loss due to depreciation in stock values		6,750	55,870

Net profit as per Financial Accounts		1,28,755

MEMORANDUM RECONCILIATION ACCOUNT

(As at 31-12-2008)

	Rs.		Rs.
To Works overheads under-recovered in cost	3,120	By Net profit as per cost a/c	1,72,400
To Loss due to obsolescence	5,700	By Administration overheads recovered in excess	1,700
To Income tax	40,300	By Depreciation recovered in Cost a/c 12,500	
To Loss due to depreciation in stock values	6,750	Fin. a/c 11,200	
To net Profit as per Financial Accounts	1,28,755	By Interest on investment	1,300
		By Bank interest and transfer fees	8,000
	1,84,625	By Stores adjustments	750
			475
			1,84,625

Illustration 2

The cost book of Mr. Ravi Sen for the year 2006 shows a profit of Rs. 50,255. The profit disclosed by his financial book is Rs. 31,200. The following information is gathered through the observation of accounts: -

- Payment for income tax was Rs. 15,000 in financial accounts.
- Bad debts amounted of Rs. 2,000 in financial books
- Factory overheads in cost accounts were Rs. 15,000 while the actual overhead was Rs. 12,255.
- Transfer fees received was Rs. 1,200.
- Rs. 1000 was paid for directors fees
- Plant costing Rs. 50,000 was installed but not yet used. Depreciation @10% was charged.

You are required to prepare a statement reconciling cost accounts profit with profit of financial accounts

Reconciliation Account

Particular	Rs.	Rs.
Profit as per cost book		50,255
Add:-		
Factory overheads	2,745	
Transfer fees	1,200	3,945
		54,200
Less:		
Income tax not charged to cost accounts	15,000	
Director's fees	1,000	
Bad Debts	2,000	
Depreciation on plants	5,000	23,000
Net profit as per Financial Accounts		31,200

Illustration 3

From the following particulars, prepares (a) profit & loss accounts (b) a statement of cost of manufactures calculating overhead at 25% of prime cost and office overhead at 75% of factory overhead, (c) a statement reconciling the profit shown by the cost accounts with that shown by the financial accounts. The selling price is fixed at cost + 25%.

Stock on 1st January 2008	
Raw material	4,000
Finished goods	8,000
Stock on 31st December 2008	
Raw material	6,000
Finished goods	2,000
Purchase of raw material	24,000
Wages	10,000
Sales	65,000
Factory overhead	7,750

Office expenses 6,100

Profit And Loss Account

	Rs.		Rs.
To opening stock		By sales	65,000
Raw material	4,000	By Closing Stock	
Finished goods	8,000	Raw material	6,000
To Purchase of raw material	24,000	Finished goods	2,000
To Wages	10,000		
To Factory Expenses	7,750		
To Office Expenses	6,100		
To Net Profit	13,150		
	73,000		73,000

Statement of Cost and Profit

Opening stock of raw material	4,000	
+ Purchase of raw material	24,000	
	28,000	
- Closing stock of raw material	6,000	
Raw material Used		22,000
Wages		10,000
Prime Cost		32,000
Factory overheads(25% of prime cost)		8,000
Factory Cost		40,000
Office overheads (75% of factory overheads)		6,000
Cost of Production Add: Opening stock of finished goods		46,000
		8,000
Less: Closing stock of Finished goods		54,000
		2,000
Profit		52,000
Sales		13,000
		65,000

Reconciliation Statement

Particular	Rs.	Rs.
Profit as per cost accounts		13,000
Add:		
Factory overheads over charged in Cost Accounts (Rs.8,000-7,750)		250
		13,250
Less:		
Office overheads under charged in cost accounts (Rs. 6,000- 6,100)		100
Profit as per P/L A/c		13,150

Illustration 4

For the year 2008, the profit as per cost accounts of ABC Company has been estimated to be Rs. 23,063 but the profit and loss account as prepared by the auditors shows Rs.16,624 from the following information, prepare a Reconciliation statement showing the causes of differences:

		Rs.		Rs.
Material			Sales	3,46,000
Opening Stock	2,47,179		Sundry Incomes	316
+ Purchase	82,154			
	3,29,333			
-Closing stock	75,121			
		2,54,212		
Direct Wages		23,133		
Office Expenses		20,826		
Factory Expenses		9,845		
Selling expenses		22,176		

Profit	16,624		
	3,46,814		3,46,814

Cost records shows (i) closing balance of stock ledger Rs. 78,197; (ii) summary of wages shows wage payment Rs. 24,867; (iii) factory overhead Rs. 19,714; (iv) Office overhead are charged at 3% of sales value; (v) selling expenses charged at 5% of sales value; (vi) Sundry incomes not shown in cost accounts.

Solution Reconciliation Statement

Particular	**Rs.**	**Rs.**
Profit as per cost book		23,063
Add:-		
i. Wages over charged (24,867-23,133)	1,734	
ii. Office overhead over recovered (10,395- 9,845)	550	
iii. Sundry income not shown in cost accounts	316	2,600
Less:		
i. Over valuation of stock (75,197- 75,121)	3,076	
ii. Factory overhead under recovered (20,826-19,714)	1,112	
iii. Selling expenses under recovered (22,176-17,325)	4,851	9039
Net profit as per Financial Account		16,624

SELF CHECK QUESTION

1. There is a difference between the profit shown by cost accounts and the profit shown by financial accounts of a business concern. Explain the reasons for the difference by giving examples?

2. State the reasons for disagreement between the costing and financial result. Prepare an imaginary reconciliation statement?

PRACTICAL QUESTION:

1. The net profit disclosed by a company's cost accounts for the year was Rs, 30,114 while the net profit as shown by the financial accounts amounted to Rs. 19,670 due to the following reasons:

(a) Overheads in the cost accounts amounted were estimated at Rs. 7,500 however the charges for the year shown by the financial accounts was Rs. 6,932.

(b) Directors fees not charged in the cost accounts amounted to Rs. 750.

(c) General provision for bad debts, Rs. 600

(d) A new factory of Rs.12, 000 was installed this year, on which depreciation of 5% was provided for in the financial accounts.

(e) Transfer fees received amounted to Rs 28.

(f) Income tax charged Rs. 9,000.

2 The net profit of Kamal manufacturing Co. Ltd. appeared at Rs. 64,377 as per the financial records for the year ended 31st December 2008. The cost book however showed a net profit of Rs. 86,200 for the same period. A scrutiny of the figures from both the sets of accounts revealed the following facts:

(a) Works overhead under recovered in excess (in cost)		1,560
(b) Administrative overhead recovered in excess		850
(c) Depreciation recovered in costs		6,250
(d) Depreciation recovered in financial accounts		5,600
(e) Interest on investment not included in costs	4,000	
(f) Loss due to obsolescence charged in financial accounts	2,850	
(g) Income tax provided in financial accounts	20,150	
(h) Bank interest and transfer fees (in financial books)	375	
(i) Stores adjustment (credit in financial books)		237
(j) Loss due to depreciation in stock values (in financial account)	3,375	

Prepare a statement showing the reconciliation between the figure of net profit as per cost accounts and the figure of the net profit as shown in the financial books. Also prepare a memorandum reconciliation account.

3. From the following particulars prepare (a) a statement of cost of manufacture for the year 2007 showing the percentage which each individual items of cost bears to the cost; (b) a statement of profit as per cost accounts and (c) profit and loss accounts in the financial books, and show to what you would attribute the difference in the profit as shown by (b) and (c).

- Opening stock of raw materials 60,000
- Opening stock of finished articles 1,20,000
- Purchase of raw materials 3,60,000
- Stock of raw materials at the end 90,000
- Stock of finished articles at the ends 30,000
- Wages 1,50,000

Calculate factory overhead at 25% on prime cost and office overhead at 75% on factory overhead. Actual works expenses amounted to Rs. 1,16,250 and actual office expenses amounted to Rs 91,500. The selling price was fixed at a profit of 20% of the selling price.

4. Mittal industry Ltd. financial accounts shows the following profit & loss A/c for the year ending 31st Dec. 2008

	Rs.		Rs.
To Opening stock	2,47,179	By Sales	3,46,500
To Purchase	87,420	By closing stock	75,121
To Direct wages	24,867		
To Factory Expenses	20,826		
To Gross Profit c/d	48,329		
	4,21,621		4,21,621
To Administrative Expenses	9,845	By Gross Profit b/d	48,329
To Selling expenses	22,176	By Sundry Income	316
To Net Profit	16,224		
	48,645		48,645

The profit as per company cost accounts was Rs. 24,797; the following additional information is available from costing record:

(a) Closing stock Rs. 78,197

(b) Factory overhead absorption Rs. 19,714

(c) Administration overhead absorption @ 3%of sales

(d) Selling overheads @5% of sales

(e) No credit for sundry income was given

Prepare Reconciliation statement.

LESSON 10
CONTRACT COSTING - I

CONTEXT OF THE LESSON

Contract costing is a specialised system of job costing which is applied in long term contracts. This chapter deals with the various items of cost and the procedure of recording cost incurred on contracts and method to determine profit in case of incomplete contracts.

OBJECTIVES OF THE LESSON

To know the meaning of contract costing

To understand elements of cost in contract account

To deal with the methods for calculating profit or loss on contract accounts.

Meaning of Contract Costing:

Contract or terminal costing, as it is termed is one form of application of the principles of job costing. Contract costing is that form of specific order costing which applies where work is undertaken on the special requirements of customer and each order is of a long term period. Contract costing is usually adopted in civil construction, engineering projects, ship building, road and railways line construction, bridges etc.

Contract costing being a part of specific order costing method is applied where substantial time is taken for completion of the work and which may even take several years to get itself completed. However, some contract may even be finished within a short duration and may not involve more than one accounting period. If the profit on contracts is recorded only after their completion, then wide fluctuations in the profit may be noticed in different accounting periods. It may be possible that in some financial year only few contracts may be completed and in any other financial year a large number of contracts may be completed. To avoid the fluctuations in the reported profits and

to reflect the revenue in the same accounting period during which the activity is undertaken the profit in respect of each contract in progress is transferred to the profit and loss account of the year by calculating the notional profit. The portion of notional profit to be transferred to the profit and loss account depends on the stage of completion of a contract.

SELF CHECK QUESTION

1. What is the contract costing? Explain
2. Mention the type of job where contract costing is applied.

Procedure of contract costing:

Each contract is identified with a distinguished number for the purpose of accounting of cost and administration. For each contract a separate account is prepared and all costs related to the specific contract is charged to the respective contract. Contract cost generally includes a major part of expenses of direct nature in the form of cost of material, wages, plants and stores and direct expenses and some portion of indirect expense are apportioned as overheads. The items of cost which is generally dealt in contract costing is discussed as below:

Material Cost :

All materials supplied for the contract from the stores or purchased directly for the contract are debited to the concerned contract account.

The cost of material transferred from one contract to other contract, material returned to stores or material lying at site is credited to the contract account.

If any material is sold then the concerned contract account is credited with the sale price. Any profit or loss arising there from is transferred to the Profit and Loss Account.

Any theft or destruction of material by fire represent a loss and as such, the same is transferred to the Profit and Loss Account.

lf any stores items are used for manufacturing tools, the cost of such stores items are charged to the work expenses account.

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.

Labour Cost:

The labour actually employed or worked at the site of the contract is regarded as direct labour (irrespective of the nature of the task performed) and the wages paid to them are charged to the concerned contract directly or on the basis of a wage analysis sheet. The salaries and incentives of the administrative and supervisory staff of a specific contract is also charged to that specific contract.

Direct Expenses:

Direct expenses (if any) which are exclusively incurred for a specific contract are directly charged to the concerned contract.

Indirect Expenses:

Indirect expenses (such as expenses of engineers, surveyors, supervisors etc.) may be distributed over several contracts as a percentage of cost of materials, or wages paid or of the prime cost. lf however, the contracts are big, the labour hour method may be used for the distribution of expenses.

Plant and Machinery:

If the plant is taken on hire then hire charges paid will be debited to the contract account.

In case if the plant is purchased specifically for the contract or plant was sent to a specific contract then the value of the plant is debited to contract account and the written down value thereof at the end of the year is entered on the credit side for closing the contract account. The difference in the value debited and credited shows the value of plant used at site.

If in between the accounting period of the contract, any part of the plant is sold then the value of plant sold is credited to the contract account and profit and loss arising due to sale is transferred to the profit and loss account.

If any plant is damaged or returned to store, then the contract account is credited by its cost.

If a plant is to be used in the contract for a shorter period of time then the contract account is debited by the amount of depreciation for the time the plant was used in the contract account.

Sub-Contract Cost:

When any job to be performed on a contract or a part of the contract is given to a other contractor on sub contract basis then the payment made to the sub contractor is termed as Sub-contract costs and such costs are also debited to the Contract Account.

Cost of Extra work:

When any extra work is requested by the contractee to be performed on the contract which was earlier not included in the original contract then the cost of 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. lf it is not substantial, expenses incurred should be debited to the contract account as "Cost of Extra work".

Cost of work certified:

Contractor receives payments on the contract periodically known as "running payment" on the basis of the architect’s or surveyor’s certificates. These payments are not equal to the value of the work certified which has been certified by the surveyor. A certain amount or a percentage of the amount due is retained as security for any defective work which may be discovered later within the guarantee period or to safeguard himself from the risks that may arise in future from the contractor.

Mathematically:

Cost of work certified = Cost of work to date — (Cost of work uncertified + Material in hand + Plant at site) The amount retained is called retention money. The full value of the work certified should be credited to the Contract Account and debited to the account of the contract. Since the

cash received from him will be less, the balance in his account will be shown as an asset in the balance sheet.

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 contractee's architect. It is always shown at cost price.

The cost of uncertified work may be ascertained as follows:

Particular		Rs.
Total cost to date		-----
Less: Cost of work certified	-----	
Material in hand	-----	
Plant at site	-----	
Cost of work certified		-----

Retention money: A contractor does not receive full payment of the work certified by the surveyor. Generally the contractee retains some amount (say 10% to 20%) to be paid, after sometime, when it is ensured that there is no fault in the work carried out by contractor. 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.

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.

Work-in-progress: 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; and (iii) the amount of profit taken as credit. In the Balance Sheet, the work-in-progress is 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 and the cost of labour, material and expenses of work which has not yet reached the stage of completion are shown under the head "uncertified" work-in-progress.

SELF CHECK QUESTIONS

1. What are the various types of cost which are debited in contract account.
2. What are the various items which are shown in credit side of contract account.
3. What do you mean by work certified and work uncertified.
4. What is retention money. What is the use of retention of money in contract accounts.
5. How is cost of plant shown in contract account. Discuss.

Calculation of Profit and Loss Account

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 not yet certified)

Estimated profit: It is the excess of the contract price over the estimated total cost of the contract.

Profit/loss on incomplete contracts: To determine the profit to be taken to Profit and loss account the following conditions are taken into consideration:

(i) If completion of contract is less than 25% or less than one-fourth of the value of contract price: In this case no profit should be taken into profit and loss account.

(ii) If completion of contract is up to 25% or more than 25% but less than 50% of the value of contract: ln this case one-third of the notional profit, reduced in the ratio of cash received to work certified, should be transferred to the Profit and Loss Account.

Mathematically:

$$\frac{1}{3} \times \text{Notional Profit} \times \frac{\text{Cash received}}{\text{Work Certified}}$$

(iii) If the work completed on contract is up to 50% or more than 50% but less than 90%: In this case, two-third of the notional profit, reduced by proportion of cash received to work certified, is transferred to the Profit and Loss Account.

Mathematically:

$$\frac{2}{3} \times \text{Notional Profit} \times \frac{\text{Cash received}}{\text{Work Certified}}$$

(iv) If completion of the work on contract is up to 90% or more than 90% i.e. it is nearing completion - In this case the profit to be taken to Profit and Loss Account is determined by determining the estimated profit. In order to calculate the estimated profit any one of the following formula can be used which are as follows:

(a) $$\text{Estimated Profit} \times \frac{\text{Work received}}{\text{Contract price}}$$

(b) $$\text{Estimated Profit} \times \frac{\text{Work received}}{\text{Contract price}} \times \frac{\text{Cash received}}{\text{Work Certified}}$$

OR

(c) $$\text{Estimated Profit} \times \frac{\text{Cash received}}{\text{Contract price}}$$

(d) $$\text{Estimated Profit} \times \frac{\text{Cost of work to date}}{\text{Estimated total cost}} \times \frac{\text{Cash received}}{\text{Work Certified}}$$

(e) $\text{Notinal Profit} \times \frac{\text{Work certified}}{\text{Contract price}}$

(This formula may be preferably used in the absence of estimated profit figure.)

It is preferable to use formula (b) in the absence of specific instructions.

SELF CHECK QUESTIONS

1. Discuss the procedure of determining profit or loss in contract account.
2. What are the rules of calculating profit in case of incomplete contract.

Cost plus Contract: Under Cost plus Contract, the contract price is ascertained by adding a percentage of profit to the total cost of the work. Such type of contracts are entered into when it is not possible to estimate the contract cost with reasonable accuracy due to unstable condition of material, labour services, etc.

Escalation Clause - If during the period of execution of a contract, the prices of materials, or labour etc., rise beyond a certain limit, the contract price will be increased by an agreed amount. Inclusion of such a clause in a contract deed is called an "Escalation Clause".

HOME ASSIGNMENTS

1. What is contract costing? What important points should be kept in mind in its preparation?
2. What is a contract account? What are the various items debited and credited in contract accounts.
3. How is profit calculated in case of incomplete contracts? Discuss
4. Explain the following
    a. Work Certified
    b. Work Uncertified
    c. Retention Money
    d. Cost plus contract
    e. Escalation Clause

LESSON 11
CONTRACT COSTING - II

CONTEXT OF THE LESSON

This lesson deals with preparation of contract account in case of complete and incomplete contracts. It also specifies procedure of calculation of profits in case of long term contracts.

OBJECTIVES OF THE LESSON

- To deal with numerical aspects of preparation of contact account.
- To calculate profits in case of incomplete contracts.

Illustration: 1

The following expenses were incurred on a contract:

Material purchased	6,00,000
Material drawn from stores	1,00,000
Wages	2,25,000
Plant issued	75,000
Chargeable expenses	75,000
Apportioned indirect expenses	25,000

The contract was for `20,00,000 and it commenced on January 1, 1998. The value of the work completed and certified up to 30th November, 1998 was `13,00,000 of which `10,40,000 was received in cash, the balance being held back as retention money by the contractee. The value

of work completed subsequent to the architect's certificate but before 31st December, 1998 was `60,000. There were also lying on the site materials of the value `40,000. It was estimated that the value of plant as at 31st December, 1998 was `30,000.

Solution :

Contract Account

Particular	Amount	Particular	Amount
To Material purchased	6,00,000	By Work-in-progress:	
Stores issued	1,00,000	Work certified	13,00,000
Wages	2,25,000	Work uncertified	60,000
Plant	75,000	Plant less depreciation	40,000
Chargeable expenses	75,000	Material unused	30,000
Indirect expenses	25,000		
Profit and Loss Account2/3rds of profit on cash basis	1,76,000*		
Work—in-progress balance of profit c/d	1,54,000		
	14,30,000		14,30,000
Balance b/d Work certified	13,00,000		
Uncertified	60,000		
	40,000		
	30,000		

Material at site	14,30,000		
Plant at site	1,54,000		
	12,76,000		
Less: Reserves			

*Computation of Profit :	Rs.
Apparent profit	3.30,000
2/3rd of that since 65% of the work is complete	2, 20,000
80% of that on cash basis	1, 76,000

An alternative method of presentation can be to deduct the balance of profit to be carried down (Rs. 1,54.000 in the above case) from the work certified before it is entered in the contract account. It will be Rs. 1 1,46,000 in the illustration given above. Of course, the reserve to be so deducted from the work certified will have to be first ascertained by considering the value of the work certified.

Illustration: 2

A contractor prepares his accounts for the year ending 31st December each year. He commenced a contract on 1st April, 2007.

The following information relates to the contract as on 31st December, 2007:

Material used	2,51,000
Labour charges	5,65,600
Salary to foreman	81,300

A machine costing Rs. 2, 60,000 has been on the site for 146 days, its working life is estimated at 7 years and its final scrap value at Rs. 15,000. A supervisor, who is paid Rs. 8,000 p.m., has devoted one-half of his time to this contract.All other expenses and administration charges amount to Rs 1,36,500Material in hand at site costs Rs. 35,400 on 31st December, 2007.

The contract price is Rs. 20,00,000, On 31st December, two third of the contract was completed. The architect issued certificates covering.50% at the contract price, and the contractor had been paid Rs. 7,50,000 on account. Prepare Contract A/c and show how much profit or loss should be included in financial accounts to 3lst December, 2007.

Solution:

Contract Account

Particular	Amount	Particular	Amount
To Material issued	2,51,000	By Machine (see note-1)	2,46,000
Labour charges	5,65,600	Material (in hand)	35,400
Foreman salary	81,300	Works cost	10,49,000
Machine	2,60,000		
Supervisor's salary (Rs. 8,000 X 9) / 2	36,000		
Adm. Charges	1,36,500		
	13,30,400		13,30,400
To Work cost	10,49,000	By Work certified	10,00,000
Notional Profit	2,13,250	Work uncertified(see note-2)	2,62,250
	12,62,250		12,62,250
To, Profit & Loss A/c	1,06,625	By Notional Profit	2,13,250
Work- in -progress	1,06,625		
	2,13,250		2,13,250

Notes :

1. Machine:

$$[(\ Rs.2{,}60{,}000 - Rs.15{,}000)] \times \frac{146}{365} = Rs.14{,}000$$

Hence the value of machine after the period of 146 days is

Rs. 2,60,000 – Rs14,000 = Rs. 2,46,000

2. The cost of 66.67% of the contract is Rs. 10,49,000

Cost of 100% of the contract is Rs. $\frac{\boldsymbol{Rs.10{,}49{,}000}}{\boldsymbol{66.67}} \times 100$ = Rs. 15, 73,500

Cost of 50% of the contract which has been certified by the architect is Rs. 7, 86,750. Also the cost of 16.67% of the contract. Which has been completed but not certified by the architect is Rs. 2, 62,250

Illustrations: 3

Bansals Constuction Company Ltd. took a contract for Rs.6,00,000 expected to be completed in three years. The following particulars relating to the contract are available:

	2006 **Rs.**	**2007** **Rs.**	**2008** **Rs.**
Materials	6,75,000	10,50,000	9,00,000
Wages	6,20,000	9,00,000	7,50,000
Cartage	30,000	90,000	75,000
Other expenses	30,000	75,000	24,000

Cumulative work certified	13,50,000	45,00,000	60,00,000
Cumulative work uncertified	15,000	75,000	-

Plant costing Rs.3,00,000 was bought at the commencement of the contract. Depreciation was to be charged at 25% per annum, on the written down value method. The contractee pays 75% of the value of work certified as and when certified, and makes the final payment on completion of the contract.

You are required to make contract account and contractee account as they would appear in each of the three years. Also show the work-in-progress and other they items should appear in the balance sheet:

Solution

Contract Account

Particular	Rs	Particular		Rs.
To Materials	6,75,000	By Plant c\d		2,25,000
To Wages	6,20,000	By work-in-progress		
To Cartage	30,000	Work certified	13,50,000	
To Other expenses	30,000	Work uncertified	15,000	13,65,000
To Plant	3,00,000	By Profit & Loss a\c		65,000
	16,55,000			**16,55,000**

2007	Rs	2007	Rs.

To Work in progress		By Work in Progress c/d	
Work certified 13,50,000		Work certified 45,00,000	
Work uncertified 15,000	13,65,000	Work uncertified 75,000	45,75,000
To Plant b\d	2,25,000	Plant at site c\d	1,68,750
To Materials	10,50,000		
To Wages	9,00,000		
To Cartage	90,000		
To Other expenses	75,000		
To Notional profit c\d	10,38,750		
	47,43,750		47,43,750
Profit &Loss A\c	5,19,375	By Notional profit b\d	10,38,750
Work-in-progress c\d	5,19,375		
	10,38,750		10,38,750
2008		2008	
To Work-in-progress b\d		By Work-in-progress b\d	
Work certified 45,00,000		Plant at site	5,19,375
Work uncertified 75,000	45,75,000	Contractee's A\c	1,26,375
To Plant b\d	1,68,750		60,00,000
To Materials	9,00,000		
To Wages	7,50,000		
To Cartage	75,000		
To Other expenses	24,000		
To Profit & Loss\c	1,53,187		
	66,45,937		66,45,937

Working Notes:

1. In 2006, there is a loss, and so the whole of it will be transferred to the profit and loss account.

2. In 2007,the contract is 3\4th complete. Hence the profit to be transferred to the profit and loss account will be determined as under:

$$= \frac{2}{3} \times \text{Notional profit} \times \frac{\text{Cash received}}{\text{Work certified}}$$

$$= \frac{2}{3} \times 10{,}38{,}750 \times \frac{33{,}75{,}000}{45{,}00{,}000} = \text{Rs. } 5{,}19{,}375$$

Contractee's Account

	Rs.		Rs.
To Balance c\d2007	10,12,500	By Bank2007	10,12,500
		By Balance b\d	
To Balance c\d2008	33,75,000	By Bank2008	10,12,500
		By Balance b\d	23,62,500*
To Contract A\c	60,00,000	By Bank	
			33,75,000
			26,25,000
	60,00,000		60,00,000

*The total value of work certified at the end of 2007 was Rs.45,00,000 of that worth Rs.13,50,000 was certified in 2006.Hence,the cash to be received in 2007 is 75% of Rs.31,50,000(Rs.45,00,000-Rs.13,50,000)i.e.Rs.23,62,500.

Balance sheet (Extract 2006)

Liabilities	Rs.	Assets		Rs.
Capital	-	Plant at site		2,25,000
Less: Loss during the year	65,000			
		Work-in-progress: Rs.		
		Work certified	13,50,000	
		Work uncertified	15,000	
			13,65,000	
		Less: Cash received	10,12,500	3,52,500

Balance sheet (Extract 2007)

Liabilities	Rs.	Assets	Rs.

Capital	-	Plant at site		1,68,750
Add: profit during the year		Work-in-progress:Rs.		
	5,19,375	Work certified	45,00,000	
		Work uncertified	75,000	
			45,75,000	
		Less: Profit in reserve	5,19,375	
		40,55,625		
		Less: Cash received	33,75,000	6,80,625

Balance sheet (Extract 2008)

Liabilities	Rs.	Assets	Rs.
Capital	-	Plant at site	1,26,562
Add: Profit during the year	1,53,157		

Illustration:4

Compute a conservative estimate of profit on a contract (which has been 90% complete) from the following particulars. Calculate the proportion of profit to be taken.

Total expenditure to date	4,50,000
Estimated further expenditure to complete the contract(including contingencies)	25,000
Contract price	6,12,000
Work certified	5,50,800
Work uncertified	34,000
Cash received	4,40,640

Solution:

Computation of notional profit	**Rs.**
Value of work certified	5,50,800

Less: Cost of work certified (Rs.4,50,000-Rs.34,000)		4,16,000
Notional Profit		1,34,800
Computation of notional profit		6,12,000
Contract price	4,50,000	
Less: cost of work done	25,000	
Estimated further expenditure to complete the contract		
Estimated total cost		4,75,000
Estimated Profit		1,37,000

Profit &loss Account under various methods and give your recommendations

Profit to be transferred under various methods

(i) $= \text{Notional profit} \times \frac{\text{Work certified}}{\text{Contract price}}$

$= \text{Rs. } 1,34,800 \times \frac{\text{Rs.5,50,800}}{\text{Rs.6,12,000}}$ =Rs.1, 21,320

(ii) $= \text{Estimated profit} \times \frac{\text{Work certified}}{\text{Contract price}}$

$= \text{Rs. } 1,37,000 \times \frac{\text{Rs. 5,50,800}}{\text{Rs. 6,12,000}}$

=Rs.1,23,300

(iii) $= \text{Estimated profit} \times \frac{\text{Work Certified}}{\text{Contract Price}} \times \frac{\text{Cash Recevied}}{\text{Work Certified}}$

$$= \text{Rs. } 1,37,000 \times \frac{\text{Rs. 5,50,800}}{\text{Rs. 6, 12,000}} \times \frac{\text{Rs. 4,40,640}}{\text{Rs. 5, 50,000}}$$

= Rs.98, 640

(iv) $\text{Estimated Profit} \times \frac{\text{Cost of Work date}}{\text{Estimated total cost}}$

$$= \text{Rs. } 1,37,000 \times \frac{\text{Rs. 4, 50,000}}{\text{Rs. 4, 75,000}}$$

=Rs.1, 29,790

(v) $\text{Estimated Profit} \times \frac{\text{Cost of Work date}}{\text{Estimated total cost}} \times \frac{\text{Cash Recevied}}{\text{Work Certified}}$

$$= \text{Rs. } 1,37,000 \times \frac{\text{Rs. } 4,50,000}{\text{Rs. } 4,75,000} \times \frac{\text{Rs. } 4,40,640}{\text{Rs. } 5,50,800}$$

=Rs.1, 03,832

Recommendations:

It is recommended that a sum of Rs.98,640 may be transferred to the profit and loss account. This amount is the least and has been arrived by using the formula (iii) above. According to this formula, profit transferred to the profit and loss account is generally kept the minimum and allows withholding in reserve a larger portion of notional profit to meet future unforeseen expenses and contingencies.

5 M.P. Construction company took a contract of Rs. 50,00,000 for the construction of new buildings in a college. Following expenditure was incurred during the year.

Material directly purchased	4,50,000
Material issued from stores	5,00,000
Plant installed (cost)	3,50,000
Wages paid	10,00,000
Other expenses	1,65,000
Accrued Wages & Other Expenses	4,25,000

Of the plant and materials charged to contract account. Plant costing Rs. 20,000 and material costing Rs. 1,50,000 were destroyed. Material costing Rs. 20,000 were sold for Rs.25, 000. Plant costing Rs. 5,000 was transferred to stores at the last day of the year and a part of plant whose cost was Rs. 2,000 became useless due to damage. Work costing Rs. 24,00,000 was certified 80% of which was received in cash. Work done but not certified was Rs. 10,000. Depreciate plant @ 10 per annum. Prepare contract account for the year and show the items related contract in the balance sheet.

Solution: **Contract Account**

	Rs.			Rs.
To Materials Purchased	4,50,000	By Work-in-progress:		
To Materials issued from stores	5,00,000	Work certified	24,00,000	
To Wages Paid	10,00,000	Work uncertified	10,000	24,10,000
To Plant issued	3,50,000			
To Other expenses	1,65,000	By P/L A/c:		
To Accrued Wages & other expenses	4,25,000	Plant destroyed		20,000
To P/L A/c (Profit on Mat. Sold)	5,000	Materials destroyed		1,50,000

To Balance c/d(National Profit)	7,200	Plant damaged	2,000
		By Materials sold	25,000
		By Plant transferred to stores	4,500
		By Plant at site	2,90,700
	29,02,200		29,02,200
To P/L A/c	1,920	By Balance b/d(Notional Profit)	7,200
To Work-in-progress			
(Profit Reserved)	5,280		
	7,200		7,200

Profit to P/L A/c = 7,200 *1\3 *80\100 = Rs.1,920.

Work-in-Progress Account

	Rs.		Rs.
To Contract A/c:		By Contract A/c (Profit reserved)	5,280
Work certified	24,00,000		
Work uncertified	10,000	By Balance c/d	24,04,720

Balance Sheet (Asset side only)

	Rs.	Rs.
Work-in-Progress	24,04,720	
Less: Cash received from Contractee	19,20,000	4,84,720
Plant at site		2,90,700

Note: Plant at site:

		Rs.
(1) Total Cost of Plant issued		3,50,000
Less: Cost of Plant destroyed	20,000	
Cost of Plant returned	5,000	
Cost of Plant damaged	2,000	27,000
		3,23,000
Less: Depreciation @ 10% p.a.		32,300
	Plant at site	2,90,700
(2)Plant transferred to stores		
Cost of Plant returned		5,000
Less: Dep: for whole year @10% p.a.		500
		4,500

6 The following particulars relate to a contract undertaken by a firm of Engineers :

Materials sent to site	85,349
Labour engaged on site	74,375
Plant installed at cost	15,000
Direct expenditure	3,169
Establishment charges	4,126
Materials retuned to Stores	549
Work certified	1,95,000
Cost of work not certified	4,500
Materials in hand on 31st December	1,883
Wages accrued due at 3lst December	2,400
Direct expenditure accrued due at 3lst Dec.	240
Value of plant at 31st December	11,000

The contract price has been agreed at Rs. 2,50,000. Cash received from the contractee was Rs. 1, 80,000

You are required (a) to prepare Contract Account showing profit, (b) to prepare Contractee's Account, (c) suitable entries in the Balance Sheet of the Contractors.

Solution:(a) Contract Account

(for the year ended 31st December)

		Rs.		Rs.
To Materials		85,349	By Materials returned to stores	
To Labour	74,375		By Work-in-progress:	549
Add: Wages due	2,400	76,775	Work certified	
			Work uncertified	1,95,000
To Plant installed		15,000	By Materials in hand	4,500
To Direct expenditure	3,169		By Plant at site	1,883
Add: Direct exp.due	2,40	3,409		11,000
To Establishment charges		4,126		
To Balance c/d		28,273		
	Rs.	2,12,932		2,12,932
			By Balance b/d	
To Profit & Loss A/c		17,399		28,273
To Work-in-progress		10,874		
	Rs.	28,273	Rs.	28,273

(b) Contractee's Account

	Rs.		Rs.
To Balance c/d	1,80,000	By Bank A/c	1,80,000

(c)Balance Sheet(As at 31st December)

Liabilities	Amount Rs.	Assets	Amount Rs.
Outstanding Liabilities:		Materials in hand	1,883
Wages accrued due	2,400	Plant at site	11,000
Direct expenditure due	2,40	Work-in-progress	
Profit & Loss Account	17,399	(Rs.199,500-10,874)	
		1,88,626	

		Less: Cash received from contractee 1,80,000	8,626

(Methods of Determination of W.I.P)

Value of Work certified	1,95,000
Add: Cost of Work uncertified	4,500
	1,99,500
Less: Profit reserved (or Profit not taken credit of)	10,874
W.I.P. Rs.	1,88,626

Cost of Work certified	1,66,727*
Add: Cost of Work uncertified	4,500
Profit taken credit for	17,399
W.I.P. Rs.	1,88,626

*[{85,349+76,775+15,000+3,409+4,126-(549+4500+1,883+11,000}]

7 Surbhi & Co. closes its accounts annually on 31st December. Contract No 265 commenced on 1st April. The costing records show the following information on 31st December, 2006

Materials issued	24,000
Wages	45,000
Outstanding wages	2,000
Office expenses	4,000
Foreman's salary	5,000
Direct expenses	10,000
Sub-Contract costs	3,000

A machine costing Rs. 16,000 had been on the site for 146 days. Its working life is estimated at five year and its scrap value at Rs. 1,000. A supervisor who is paid Rs. 1,000 pm. has spent one-half of his time on this contract.

Materials at site on 3 l st Dec., 2006 were Rs. 3,000. The contract price is Rs. 2,00,000 and 2/3 of contract was completed by 31st Dec., 2006. Architect had issued certificate covering 60% of contract price. 80% has so far been received by the contractor. Prepare Contract Account, Works-in-Progress Account and Contractee‘s Account,

Solution: **Contract No.265 Account**

		Rs.		Rs.
To Materials issued		24,000	By Materials at site	3,000
To Wages	45,000		By Cost of work	95,700
Add: Outstanding	2,000	47,000		
To Office expenses		4,000		
To Foreman’s salary		5,000		
To Direct expenses		10,000		
To Sub-contract cost		3,000		
To Depreciation on machine		1,200		
To Supervision charges		4,500		
		98,700		98,700
To Balance c/d		33,870	By Work-in-progress A/c:	
			Work certified	1,20,000
			Work uncertified	9,570
		1,29,570		1,29,570
		18,064		33,870
To Profit & Loss A/c		15,806	By Balance b/d	
To Work-in-progress		33,870		33,870

Work- in-Progress Account

	Rs.		Rs.
To Contract A/c:		By Contract A/c(Profit reserved)	
Works certified	1,20,000		15,806
Works uncertified	9,570	By Balance c/d	1,13,764
	1,29,570		1,29,570

Contractee's Account

	Rs.		Rs.
To Balance c/d	96,000	By Bank A/c	96,000

Cost of Work Uncertified:

Cost of 2\3 work completed =Rs.95,700

Cost of full contract = 95,700 * 3\2 = Rs.1,43,550

Cost of Work certified =1,43,550 * 60%=Rs.86,130

Value of uncertified Work=95,700-86,130=Rs.9,570

(4) Profit taken to P/L A/c:

33,870 *2\3*80\100=Rs.18,064

NUMERICALS

1. Prepare Contract Account from the following particulars:

Materials Rs.40,000;Wages Rs.27,000;Plant Rs.18,000;Stores issued Rs.2,000;Loose tools Rs.3,500;Other indirect expenses Rs.2,700;Running materials of tractor and wages of drivers Rs.6,000;.The contract was completed in 73 days. At the end of this period plant was returned after charging 15% depreciation on original cost. The values of loose tools and stores returned were Rs.2,400 and Rs.900 respectively. The value of the tractor was Rs.18,000 and depreciation was to be charged to this contract at the rate of 15% per annum. You are required to provide for Administration expenses at the rate of 10% on total works cost. The contract price was Rs.1, 15,000.

Ans: Works cost Rs.81, 140, Total Profit Rs.25, 746.

2. A contractor undertook a contract of Rs.5, 00,000 on 1st January, 2007.The work was completed on 30th June, 2007.Following are the details of this contract.

Particular	Rs.
Materials sent to site from stores	30,200
Materials purchased directly from vendor	45,500
Materials received from other contracts	20,300
Labour engaged	1,35,000
Direct charges	42,000
Plant installed at site	40,000
General expenses	32,000
Establishment charges	18,000
Wages accrued	12,000
Direct charges accrued	3,000
General charges accrued	5,000
Materials returned to stores	15,000
Materials at site	13,000
Materials transferred to other contracts	11,000
Materials sold(costing Rs.8,000)	9,000
Plant sold (costing Rs.15,000)	10,000
Materials destroyed by fire	8,000

Prepare a contract account charging depreciation on plant@10% per annum from the above particulars.

Ans: Profit to Profit & Loss A\c,Rs.2,10,750.

Hints: It is assumed that plant has been sold in the beginning.

3. The following particulars relate to a contract undertaken by a firm of engineers:

(Year 1.1.2006 to 31.12.2006)

Particular	Rs.

Materials sent to site	85,349
Labour engaged	74,375
Plant installed	15,000
Direct expenses	3,169
Establishment charges	4,126
Materials returned to stores	549
Work certified	1,95,000
Work not certified	4,500
Materials in hand on 31.12.06	1,883
Wages due on 31.12.06	2,400
Direct expenses accrued 31.12.06	240
Value of Plant 31.12.06	11,000

The contract price was Rs.5, 00,000.Cash received from contractee was Rs.1, and 80,000.You are required to (a) Prepare the Contract Account, (b) Prepare the contracture's Account.

Ans: Total Profit Rs.28, 273, Profit to P &L-Rs.8, 699, Profit to WIP-Rs.19, 574.

4. The Gujarat Engineering Company Limited undertakes large contracts. On 31st Dec.,2006 when annual accounts were prepared, the position of a bridge contract which was commenced on 1st April,2006 was as follows:

Materials purchased RS. 6,00,000; Wages paid Rs.7,00,000;Sundary expenses Rs.30,000;Plant dispatched to site (cost) Rs.1,00,000;Wages accrued Rs.10,000;Materials in hand Rs 24,000.The value of work certified was Rs.14,40,000 of which Rs.10,80,000 has been received. The work finished but uncertified was valued at Rs.40, 000.The plant on the site on 31st Dec., 2006 was valued at Rs.80,000.The contract price was Rs.24,00,000 ant the cost of the work to date was within the estimates.

You are required to prepare Contract Account show in the profit which should reasonably be transferred to the Profit & Loss Account, to calculate Work-in-progress and to show how the particulars relating to the contract should appear in the Balance Sheet of the company as at 31st December,2006.

Ans. Total profit Rs.1,44,000;Profit transferred to P&L A\c Rs.72,000;Balance of W.I.P.Rs.14,08,000.

5. A Firm of Builders, carrying out large contracts kept in a contract ledger separate account for each contract. The following particulars relate to a certain contract carried out during the year ended 31st december,2006.

Particular	Rs.
Works certified by architects	4,29,000
Cash received from the contractee	3,90,000
Materials sent to site	1,93,500
Labour engaged on site	1,64,400
Plant installed on site	33,900
Value of plant at 31.12.06	24,600
Cost of work not certified	10,200
Establishment charges	9,750
Direct expenditure	7,200
Wages accrued at 31.12.2006	5,400
Materials in hand at 31.12.2006	4,200
Materials returned to store	1,200
Direct expenditure accrued due at 31.12.2006	600
Contract price	6,00,000

You are required to prepare an account showing the profit on the contract to 31st dec.,2006.

Ans. Total Profit Rs.54,450;Profit taken to Profit & Loss Account Rs.33,000.

5. From the following information, prepare a Contract Account for the year 2006.

Particular	Rs.

Contract price	5,00,000
Materials purchased	80,000
Materials issued from the store	70,000
Payment to labour	30,000
Direct expenses	40,000
Indirect expenses	5,000
Cost received being 80% of work certified	2,00,000
Work uncertified	40,000
Materials returned to store	4,000
Materials at site	3,000
Outstanding wages	5,000
Materials destroyed by fire	4,000

The construction of building was started on 1st January,2006.Plant costing Rs 40,000 was issued to contract on 1st March,06.On 31.8.06,plant costing Rs 2,000 was transferred to other contract. Plant costing Rs.1,000 was lost by theft and of Rs.500 was destroyed by fire. Plant costing Rs.2,000 was sold for Rs.2,200.Depreciation of plant is charged each year @ 10% p.a.

Ans. Total Profit Rs.68,025;Profit P\L A\c Rs.36,280;Total of Contract Account Rs.3,38,025.

LESSON 12

JOB COSTING

CONTEXT OF THE LESSON

Job costing is the process of identifying the expenses incurred on a job against the revenue generated by that job. Job costing is an important tool for determining the cost of job which is to be undertaken on request of customer which varies according to the customer's specific requirement and hence individual cost for each job has to be calculated. For example, building contractors, subcontractors, architects and consultants often use job costing.

OBJECTIVES OF THE LESSON

- Develop a job order cost sheet for a manufacturer.
- Record the costs for each job in the job order cost sheet.

INTRODUCTION

A job is a specific order for work which is generally performed within the factory premises or workshop and the work moves through various activities and operations as a continuously identifiable unit. Job costing is that form of specific order costing which is applied in those industries where work is undertaken on the special request of the customer on its specific requirement and each job is comparatively of a small duration.

In this method, accumulation and collection of cost are made in reference to specific jobs, products or work orders. Each job or work of production is treated as a separate unit for the purpose of costing. Job costing is carried out for the purpose of ascertaining cost of each job and takes into account the cost of materials, labour and overheads etc. The job costing method is also applicable to industries in which production are in batches. The method can also be described as "Batch Costing".

The job costing method of costing may be regarded as the principal method of costing since the basic object is to analyses and ascertain cost of each unit of production so that it may be possible to control and regulate cost and to determine the profitability or otherwise of each work order or product line. The basic principles enunciated for the job costing method are, therefore valid essentially for all types of industry. For example printing: furniture: hardware; ship-building; heavy machinery; interior decoration, repairs and other similar work.

In this method of costing the cost is ascertained through preparation of a separate cost sheet for each job, disclosing cost of material issued for the job, labour charges incurred for completion of the job and overhead charges are added for ascertaining total expenditure.

JOB COSTING MAY BE EMPLOYED IN THE FOLLOWING CASES:

- When jobs are to be performed for different customers according to their specific requirements and specifications.
- When two orders are not alike and each order/job needs special treatment.
- Where the work-in—progress differs from period to period on the basis of the number of jobs in hand.

PROCEDURE OF JOB COST ACCOUNTING:

ACCOUNTING FOR MATERIALS:

The cost of direct material must be traced to and identified with specific job or work order. The identification of materials cost by jobs or work orders mainly brought about by the use of separate stores requisitions for each job or work order.

The materials cost of each job is posted to individual job cost sheets or cards in the Work-in-Progress ledger, the postings are usually made weekly or monthly. Similarly, at periodical intervals, from the material abstract books, summary cost of indirect material is posted to different standing orders or expense code numbers in the Overhead Expenses ledger. If any special material has been purchased for a particular job, it is directly charged to the job concerned.

If any surplus material is left over in the case of any job, unless it can be immediately and economically used on some other job, the same is returned to the store, and the relevant job account is credited with the value of excess material returned to the store.

If the surplus material is transferred to some other job or utilized on some other job, instead of being returned to the store, the cost thereof can be adjusted in the Work-in-Progress Ledger.

ACCOUNTING FOR LABOUR:

All direct labour cost must be analysed according to individual jobs or work orders. Similarly indirect labour cost also must be collected and accumulated under appropriate standing order or expenses code number.

The analysis of labour according to jobs or work orders is, usually, made by means of job time cards or sheets. All direct labour is charged to the specific jobs. All the idle time also is charged against appropriate standing order expense code number either in the job time card for each job or on a separate idle time card for each worker (where the job time card is issued job-wise). The time booked or recorded in the job time and idle time cards is valued at appropriate rates and entered in the labour abstract or analysis book.

The abstraction of idle time costs under suitable standing order or expenses code numbers is likewise done and the amounts are posted to the relevant departmental standing order or expense code number in the Overhead Expenses Ledger at periodical intervals. As regards other items of indirect labour cost these are collected from the payrolls books for the purpose of posting against standing order or expenses code numbers in the Overhead Expenses ledger.

ACCOUNTING FOR OVERHEAD

Manufacturing overheads are collected under suitable standing order numbers and selling and distribution overheads against cost accounts numbers. Total overhead expenses so collected are apportioned to service and production departments on some suitable basis. The expenses of service departments are finally transferred to production departments. The total overhead of production departments is then applied to products on some realistic basis. e.g. machine hour; labour hour; percentage of direct wages; percentage of direct materials; etc.

Price of the job: Price of a job may be arrived by adding the desired percentage of profit to the total cost of the job.

Treatment of spoiled and defective work: Spoiled work is the quantity of production that has been totally rejected and cannot be rectified. Defective work on the other hand refers to production that is not as perfect as the saleable product but is capable of being rectified and brought to the required degree of perfection provided some additional expenditure is incurred.

DEFECTS ARISE IN THE FOLLOWING CIRCUMSTANCES:

(1) Where a percentage of defective work is allowed in a particular batch as it cannot be avoided: ln this case when a normal rate of defectives has already been established, if the actual number of detectives is within the normal limit or is near thereto the cost of rectification will be charged to the whole job and spread over the entire output of the batch. lf on the other hand, the number of defective units substantially exceeds the normal ,the cost of rectification of the number which exceeds the normal will be written off as a loss in the Costing Profit and Loss Account.

(2) Where defect is due to bad workmanship: When the defective work is due to bad workmanship the cost of rectification will be treated as abnormal cost. The cost of rectification shall be written off as a loss. Unless by an arrangement it is to be recovered as a penalty from the workman concerned. However, it may be possible that the management practices a policy to provide for a certain proportion of defectives on account of bad workmanship as an unavoidable feature of production. lf that be the case, the cost of rectifying to the extent provided for by the management will be treated as a normal cost and charged to the batch.

(3) Where defect is due to the Inspection department wrongly accepting incoming material of poor quality: If the defect is due to negligence of the inspection department, the cost of rectification will be charged to the department and will not be considered as cost of manufacture of the batch. Being an abnormal cost, it will be written off to the Costing Profit and Loss Account.

ILLUSTRATION

The information given below has been taken from the costing records of an

Engineering works in respect of job No. 123

Material – Rs. 4,010

Wages

Deptt. A	60 Hours @ Rs. 3 p.hr
Deptt. B	40 Hours @ Rs. 2 p.hr
Deptt. C	20 Hours @ Rs. 5 p.hr

Overhead expenses

for these departments were estimated as follows:

Variable overheads:

Deptt. A	Rs. 5,000 for 5,000 labour hours.
Deptt. B	Rs. 3,000 for 1,500 labour hours.
Deptt. C	Rs. 2,000 for 500 labour hours.

Fixed overheads

Estimated at Rs. 20,000 for 10,000 normal working hours.

You are required to calculate the cost of job 123 and calculate the price to give profit of 25% on selling price.

Solution:

COST SHEET OF JOB No. 123

Particular				Amount
Materials				4,010
Wages				
	Deptt.	A(60 hrs X Rs. 3)	180	
		B (40 hrs X Rs. 2)	80	
		C(20 hrs X Rs. 5)	100	360
Overheads:				
Variables Overhead				
Deptt.	A (60 hrs X Rs. 1)	180		
	B (40 hrs X Rs. 2)	80		
	C (20 hrs X Rs. 5)	100		220
Fixed Overheads				
(120 hrs X Rs. 2)				240
TOTAL COST				4,830
Profit (25% of selling price or 33% on cost)				1,610
Sales				6,440

Working Notes:

1. **Calculation of variable overheads rate labour hour**

   Department

   A = Rs. 5,000/ 5,000 L.H. = Re. 1

   B = Rs. 3,000/1,500 L.H. = Rs. 2

   B = Rs. 2,000/ 500 L.H. = Rs. 4

2. Calculation of fixed overheads per hour

   Rs. 20,000 / 10,000 = Rs. 2

LESSON 13
PROCESS COSTING

CONTEXT OF THE LESSON

This lesson deals with process costing method which is a part of contionus operating method and applied in those industries where production is carried on regular bases and production is done on mass scale. The output is received after a sequence of process where by the output of one process becomes the input of the next process.

OBJECTIVES OF THE LESSON

- Meaning of process costing.
- Features of process costing.
- Component of cost in case of process costing method.
- Terminologies used in process costing and their treatment in process account

DEFINITION

Process costing is a method for ascertaining the total unit cost of the output of a continuous production run (such as in foodprocessing, petroleum, and textileindustries) in which a product passes through various processes. It is a method that aggregates manufacturing costs by departments or by production processes. Total manufacturing costs are accumulated in form of - direct materials, direct labor, and factory overhead incurred. Unit cost is determined by dividing the total costs charged to a process by the output of that process. Process costing is applied in those industries that produce a continuous mass of simil*ar* units through a series of operations or processes-generally used in such industries as petroleum, chemicals, oil refinery, textiles, and food processing.

CIMA's definition: The costing method applicable where goods or services result from a sequence of continuous or repetitive operations or processes. Costs are average over the units produced during the period, being initially charged to the operation or process.

FEATURES/CHARACTERISTICS OF PROCESS COSTING

Process Costing Method is applicable where the output results from a sequence of continuous or repetitive operations or processes and products are identical and cannot be segregated.

Process Costing enables the ascertainment of cost of the product at each process or stage of manufacture.

The following features may be identified with process costing:

1. The output consists of products which are homogenous.
2. Production is carried on in different stages (each of which is called a process) having a continuous flow.
3. Production takes place continuously except in cases where the plant and machinery are shut down for maintenance etc. Output is uniform and all units are identical during each process. It would not be possible to trace the identity of any particular lot of output to any lot of input.
4. The input will pass through two or more processes before it takes the shape of the output. The output of each process becomes the input for the next process until the final product is obtained, with the last process giving the final product.

5. The output of a process (except the last) may also be saleable in which case the process may generate some profit.
6. The input of a process (except the first) may be capable of being acquired from the outside sources.
7. The output of a process is transferred to the next process generally at cost to the process. It may also be transferred at market price to enable checking efficiency of operations in comparison to the market conditions.
8. Normal and abnormal losses may arise in the processes
9. An account called a process account is maintained for each process.

Elements of Cost

For the purpose of cost accounting, the process industry is divided into separate divison or departments with each division or department representing a specific process. The Direct Material and Direct Labour costs are collected for each division or department individually and the total overheads collected are apportioned over the various departments/processes on some suitable basis.

The following are the main elements of costs involved in the manufacturing organisation where process costing method is adopted.

1. **Direct Materials**

   In industries where process costing method is used the direct material can be classified into two parts:

   - **Primary Material**

     Primary materials are those materials which are introduced in the initial process and passed on to the next process as a part of output after completion of processing.

   - **Secondary Material**

     Secondary materials are those materials which are introduced in the first or subsequent processes in addition to the main material introduced in the initial process. The secondary material gets mixed up with the main material and is passed on to the subsequent processes as a part of the output.

2. **Direct Labour Cost**

   The direct labour cost is generally incurred in every process for the purpose of conversion of the shape of raw material. Identification of direct labour cost is also relatively easy in process costing industry

3. **Direct Expenses**

   All those expenses which are relevant to a specific process and are expenses which are incurred in addition to direct material and labor and which can be directly attributable to a particular process are termed as direct expenses.

   Production Overheads

The overhead expenses are generally expended over all the processes involved in production. These are to be apportioned over the various processes in an suitable manner.

- **Preparation of Process Accounts**

  A nominal account for each process is prepared to record all the costs related to the process.

  Each process account is Debited with the cost of:

  - Primary Direct Material
  - Secondary Direct Material
  - Direct Labor
  - Direct Expenses and
  - Production Overheads allocated and/or apportioned to the process.

  Each process account is Credited with:

  The value of output transferred to the subsequent process or finished stocks.

- **Process Stock Accounts**

  Stocks relevant to a process that are maintained in a separate stock account. Stock accounts for input may be maintained where all the input acquired/received for a process during a period is not used up. Stock accounts for output may be maintained where all the output produced/completed in a process during a period is not disposed off either by transfer to the next process or by sale.Where the output relevant to a process is sold apart from being transferred to the next process, it generates revenue. These revenues relevant to a process, are generally recorded using the process account or the stock account.

FORMAT OF PROCESS ACCOUNT

Process I A/c

Particulars	Quantity (in Units)	Amount (in Rs)	Particulars	Quantity (in Units)	Amount (in Rs)
To Direct Material To Other Material To Direct Labour/Labor To Production Overheads	10,000	4,00,000 50,000 1,20,000 54,000	By Process II a/c	10,000	6,24,000
		6,24,000			6,24,000

SELF CHECK QUESTIONS

1. What is process costing?

2. In which industries process costing is apply?
3. What are the characterstics of process costing?

TREATMENT OF NORMAL /ABNORMAL LOSS AND ABNORMAL GAIN

Losses can be classified based on the basis of their nature as well as of their physical form.

On the basis of nature the loss can be classified as:

- **Normal Loss**

  The loss of input/output where the occurrence is inevitable i.e. which occur on account of normal reasons are normal losses. The magnitude of the loss is dependent on the production process in consideration. Normal losses may be expressed in absolute terms as 100 units or in proportionate terms as 1/10th or in percentage terms as 2% of the inputs. Whether the calculation of loss should be based on the input or output is dependent on the method used to express the loss and to some extent on the process in consideration.

  In problem solving, where no specific mention is made, the loss is calculated (where it is given as a proportion or percentage) based on gross input.

  In process account normal loss is credited in the respective process account to which it belongs. In the unit column of the process account the normal loss units are shown and if the normal loss can be sold and some value can be realized then the value is also credited in the process account. If due to any reason the normal loss does not fetch any value then process account will be credited by the normal loss unit and no value will be credited in the amount column. If the loss is due to loss in weight of the material then loss of weight unit will be credited in the respective process account as loss in weight will fetch nothing.

- **Abnormal Loss**

  The loss of input/output whose occurrence can be avoided i.e. which occur on account of abnormal reasons are abnormal losses. This can also be interpreted as the magnitude of actual loss that is incurred in excess of the normal loss.

  It is given by the relation "Abnormal Loss Units" = "Normal Output Units" − "Actual Output Units"

  Abnormal loss is not expected to arise, when operations are carried on efficiently according to norms relating to manufacturing operations. Cost of normal loss is shared by good units of production in the process, but the same treatment cannot be given to abnormal loss.

  Abnormal loss units are valued like good units produced and the value of units representing abnormal loss is debited to a separate account, which is known as abnormal loss account. The value of abnormal loss is calculated with the help of the following formula:

$$Cost\ of\ Abnormal\ Loss = \frac{Total\ Cost - \left(\begin{matrix}Scrap\ value\ of \\ normal\ Quantity\ loss\end{matrix}\right)}{\left(\begin{matrix}Total\ Quantity \\ Input\end{matrix}\right) - \left(\begin{matrix}Normal\ Quantity \\ Loss\end{matrix}\right)} \times AbnormalQuantity\ loss$$

If the abnormal loss has got any scrap value, it should be credited to the abnormal loss account and the balance is ultimately written off to costing profit and loss account. Abnormal loss represent good units, which could have been produced if the operations had been carried out according to accepted norms of manufacturing operations.Hence, units reperesnting abnormal loss are treated at par with good units for the purpose of valuation. All cost relating to abnormal loss is debited to abnormal loss account and credited to process account.

ABNORMAL GAIN

If the quantum of loss is less than the determined percentage of normal loss, the difference is called as abnormal gain or effectiveness. Abnormal gain units should not effect the cost of good units in the normal circumstances. The value of abnormal gain is debited to the concerned process account and credited to abnormal gain account. This value is calculated at the rate at which the effective output would have been valued if normal wastage had taken place according to expectation. The value of abnormal gain is calculated by the help of the following formula:

FORMULA

$$Cost\ of\ Abnormal\ Gain = \frac{Total\ Cost - \left(\begin{matrix}Scrap\ value\ of \\ normal\ Quantity\ loss\end{matrix}\right)}{\left(\begin{matrix}Total\ Quantity \\ Input\end{matrix}\right) - \left(\begin{matrix}Normal\ Quantity \\ Loss\end{matrix}\right)} \times AbnormalQuantity\ Gain$$

A Problem (illustration)

A product is finally obtained after it passes through three distinct processes. The following information is available from the cost records.

	Process I Rs.	Process II Rs.	Process III Rs.	Total Rs.
Materials	5,200	3,960	5,924	15,084
Direct Wages	4,000	6,000	8,000	18,000
Production Overheads				18,000

1,000 units @ Rs. 6 per unit were introduced in process I. Production overheads are absorbed as a percentage of direct wages. The actual output and normal loss of the respective processes are giben below:

	Output (Units)	Normal loss as a percentage of input	Value of scrap (per unit)
Process I	950	5%	Rs. 4
Process II	840	10%	Rs. 8
Process III	750	15%	Rs. 10

Prepare the process accounts and the other relevant accounts.

SOLUTION:

Ledger Accounts

Process I a/c

Particulars	Quantity (in Units)	Amount (in Rs)	Particulars	Quantity (in Units)	Amount (in Rs)
To Material (Primary)	1,000	6,000	By Normal Loss a/c	50	200
To Material (Secondary)		5,200	By Process II a/c	950	19,000
To Direct Labour		4,000	[Output Transferred]		
To Production Overheads		4,000			
	1,000	19,200		1,000	19,200

Normal Loss a/c

Particulars	Quantity (in Units)	Amount (in Rs)	Particulars	Quantity (in Units)	Amount (in Rs)
To Process I a/c	50	200			

Process II a/c

Particulars	Quantity (in Units)	Amount (in Rs)	Particulars	Quantity (in Units)	Amount (in Rs)
To Process I a/c (Primary)	950	19,000	By Normal Loss a/c	95	760
To Material (Secondary)		3,960	By Abnormal Loss a/c	15	600
To Direct Labour/Labor		6,000	By Process III a/c [Output Transferred]	840	33,600
To Production Overheads		6,000			
	950	34,960		950	34,960

Normal Loss a/c

Particulars	Quantity (in Units)	Amount (in Rs)	Particulars	Quantity (in Units)	Amount (in Rs)
To Process I a/c	50	200			
To Process II a/c	95	760			

Abnormal Loss a/c

Particulars	Quantity (in Units)	Amount (in Rs)	Particulars	Quantity (in Units)	Amount (in Rs)
To Process II a/c	15	600			

Process III a/c

Particulars	Quantity (in Units)	Amount (in Rs)	Particulars	Quantity (in Units)	Amount (in Rs)
To Process II a/c (Pr)	840	33,600	By Normal Loss a/c	126	1,260
To Material (Secondary)		5,924	By Finished Stock a/c	750	57,000
To Direct Labour		8,000	[Output Transferred]		
To Production Overheads		8,000			
To Abnormal Gain a/c	36	2,736			
	876	58,260		876	58,260

Normal Loss a/c

Particulars	Quantity (in Units)	Amount (in Rs)	Particulars	Quantity (in Units)	Amount (in Rs)
To Process I a/c	50	200	By Ab Gain a/c	36	360
To Process II a/c	95	760			
To Process III a/c	126	1,260	By Bal c/d	235	1,860
	271	**2,220**		**271**	**2,220**
To Bal b/d	235	1,860			

Abnormal Loss a/c

Particulars	Quantity (in Units)	Amount (in Rs)	Particulars	Quantity (in Units)	Amount (in Rs)
To Process II a/c	15	600			

Abnormal Gain a/c

Particulars	Quantity (in Units)	Amount (in Rs)	Particulars	Quantity (in Units)	Amount (in Rs)
To Normal Loss a/c	36	360	By Process III a/c	36	2,736
To Costing P&L a/c	–	2,376			
	36	**2,736**		**36**	**2,736**

SELF CHECK QUESTIONS:

1. What do you mean by process costing? Explain it's features and industry to which it applies?
2. Discuss the components of cost and their treatment in process accounts?
3. Discuss the type of losses nad gains in process accounts? What accounting treatment id done for them in process accounts?

LESSON 14

PROCESS COSTING-II

(1) The product of a manufacturing concern passes through two processes A and B and then to finished stock. It is ascertained on the basis of past experience that in each process 2% of the total weight put in is lost and 10% is scrap which from process A and B realizes Rs. 100 per kg and Rs. 150 per kg respectively.

Particular	Process 1	Process 2
	Rs.	Rs.
Material consumed in kg	1,000	70
Cost of material per kg	120	200
Wages	17,500	10,000
Manufacturing expenses	5,380	5,342

Prepare process Accounts, showing the cost of the output of each process and the cost per kg.

Solution

Process A Account

Particular	**Kg**	**Rs.**	**Particular**	**Kg**	**Rs.**
To Material @Rs. 120 per kg	1000	1,20,000	By Loss in weight(2% of 1000 kg)	20	—
To Wages		17,500	By Sale of Scrap (10% of 1,000 kg)	100	10,000
To Manufacturing expenses		5,380	By Process B A/c @Rs. 151 Per Kg	880	1,32,000
	1000	1,42,880		1000	1,42,880

Process B account

Particular	Kg	Rs.	Particular	Kg	Rs.
To, Process A A/c (transfer)	880	1,32,880	By Loss in weight(2% of 950 kg)	19	—
To Material consumed	70	14,000	By Sale of Scrap (10% of 950 kg)	95	14,250
To Wages		10,000	By Finished Stock A/c @Rs. 177Per Kg	836	1,47,972
To Manufacturing expenses		5,342			
	950	1,62,222		950	1,62,222

(2) On the basis of the following information prepare process Account and a statement of profit:

Particular	Process 1	Process 2	Process 3
Raw material used	1000 ton	-	-
Cost per ton	Rs. 200	-	-
Manufacturing wages & expenses	Rs. 87,500	Rs. 34,500	Rs. 10,710
Weight lost	5%	10%	20%
Scarp (sales price Rs. 50 per ton)	50 ton	30 ton	51 ton
Sale price of output per ton	Rs. 350	Rs. 500	Rs. 800

Management expenses were Rs. 17,500 and selling expenses Rs. 10,000. Two-third of the output of process I and on half of the process II are transferred to next process and the balance are sold. The entire output of process III is sold.

Solution **Process I Account**

Particular	ton	Rs.	Particular	ton	Rs.
To Raw material used (1000 X Rs. 200)	1000	2,00,000	By Loss in weight(5% of 1000 ton)	50	—
To Manufacturing expenses & Wages		87,500	By Sale of Scrap (50 ton X Rs. 50)	50	2,500
			By Transfer to warehouse 1/3	300	95,000
			By Process II (2/3) @Rs. 316.67 per ton	600	1,90,000
	1000	2,87,500		1000	2,87,500

Process II Account

Particular	ton	Rs.	Particular	ton	Rs.
To Process I A/c	600	1,90,000	By Loss in weight(5% of 1000 ton)	60	—
To Manufacturing expenses & Wages		34,500	By Sale of Scrap (30 ton X Rs. 50)	30	1,500
			By Transfer to warehouse 1/2	255	1,11,500
			By Process III (1/2) @Rs. 497.25 per ton	255	1,11,500
	600	2,24,500		600	2,24,500

Process III Account

Particular	ton	Rs.	Particular	ton	Rs.
To Process II A/c	255	1,11,500	By Loss in weight (20% of 255 ton)	51	–
To Manufacturing expenses & Wages		10,710	By Sale of Scrap (51 ton X Rs. 50)	51	2,550
			By Transfer to warehouse @Rs. 782.09 per ton	153	1,19,660
	255	1,22,210		255	1,22,210

Statement of Profit

Particular			Rs.
Sales Price of output			
Process I = 300 ton X Rs. 350		1,05,000	
Process II = 255 ton X Rs. 500		1,27,500	
Process III = 153 ton X Rs. 800		1,22,400	3,54,900
Less : Cost of production in each process			
Process I = 300	95,000		
Process II = 255	1,11,500		
Process III= 153	1,19,660		3,26,160
		Gross Profit	28,740
Less			
Management Expenses	17,500		
Selling Expenses	10,000		
		Net Profit	27,500
			1,240

(3) The imperial manufacturing company's product passes through two distinct processes A and B and then to finished stock. It is known past experience that wastages in the processes are as under:

In process A 5% of the units entering the process.

In process B 10 % of the units entering in process.

The scrap value of the wastages in process A is Rs. 8 per 100 units and in process B is Rs. 10 per 100 units.

The process figures are:

Particular	Process A	Process B
Material consumed	3,000	1,500
Wages	3,500	2,000
Manufacturing expenses	1,000	1,000
5,000 units were brought into A costing Rs. 2,500		

The outputs were:

Process A 4,700 units

Process B 4,150 units

Prepare process cost accounts showing the cost of the output. Also show abnormal wastage.

Solution

Process A account

Particular	units	Rs.	Particular	units	Rs.
To Units introduced	5000	2,500	By Normal wastage (5% of 5000 units @ Rs. 8 per 100 units)	250	20
To Materials		3,000			
To Wages		3,500			
To Manufacturing expenses		1,000	By Abnormal wastages A/c	50	105
			By Process B A/c @Rs. 2.10 Per unit	4700	9,875
	5000	10,000		5000	10,000

Abnormal Wastage Account (Process A)

Particular	units	Rs.	Particular	units	Rs.
To, Process A A/c (transfer)	50	105	By Cash A/c sale of Scrap (Rs. 8 per 100) By P/L A/c Loss transferred	50	4 101
	50	105		50	105

Process B account

Particular	units	Rs.	Particular	units	Rs.
To, Process A A/c (transfer) To Material To Wages To Manufacturing expenses	4,700	9,875 1,500 2,000 1,000	By Normal weight (10% of 4700 units @ Rs. 10 per 100 units) By Abnormal wastages A/c By Finished Stock A/c @Rs. 3.39Per unit	470 80 4150	47 271 14,057
	4,700	14,375		4,700	14,375

Abnormal Wastage Account (Process B)

Particular	units	Rs.	Particular	units	Rs.
To, Process B A/c (transfer)	80	271	By Cash A/c sale of Scrap (Rs. 10 per 100) By P/L A/c Loss transferred	80	8 263
	80	271		80	271

(4)The product of a manufacturing concern passes through two processes A and B and then to finished stock. It is ascertained that in each process 5% of the total weight is lost an 10% is

scarp which from processes A and B realize Rs. 80 per tonne and Rs. 200 per tonne, respectively.

The following are the figures relating to both the processes:

	Process A	Process B
Material(tonne)	1,000	70
Cost of material (Rs. Per tonne)	125	200
Wages (Rs.)	28,000	10,000
Manufacturing expenses (Rs.)	8,000	5,250
Output (tonne)	830	780

Prepare process cost accounts showing cost per tonne of each process there was no stock in any process.

Solution:

Process A Account

Particular	ton	Rs.	Particular	ton	Rs.
To Material	1000	1,25,000	By Loss in weight(5% of 1000 tonne)	50	
To Wages		28,000			—
To Manufacturing expenses		8 ,000	By Normal loss(5% of 1000 tonne Rs. 80 per tonne)	100	8,000
			By Abnormal Wastage	20	3,600
			By Transfer to process B @ Rs. 180 per tonne	830	1,49,400
	1000	1,61,000		1000	1,61,000

Cost of abnormal wastage = $\frac{\text{Rs. 1, 61,000 – Rs. 8,000}}{900 – (45+90)}$ X 15 = Rs. 3,600

Process A Account

Particular	ton	Rs.	Particular	ton	Rs.
To Transfer from Process A A/c	830	1,48,400	By Loss in weight(5% of 900 tonne)	45	—
To Material	70	14,000	By Normal loss(10% of 1000 tonne Rs. 200 per tonne)	90	8,000
To Wages		10,000			
To Manufacturing expenses		5,250	By Transfer finished stock @ Rs. 210 per tonne	780	1,63,800
To Abnormal Effectives A/c	15	3,150			
	915	1,81,800		915	1,81,800

Cost of Abnormal Wastage = $\frac{\text{Rs. 1, 78,650 – Rs. 18,000}}{900 – (45+90)}$ X 15 = Rs. 3,150

(5) A limited company manufactures and sells three chemicals produced by consecutive process known as A, Band C. in each process 2% of the total weight put in is lost and 10% is residue which is from process A and B realized Rs. 100 a ton and from C process Rs. 20 per ton. The products of the three processes are dealt with as follows: -

Particular	A	B	C
Sent to warehouse	25%	50%	100%
Passed on to the next process	75%	50%	---
The following particulars are for the month of march: -			
Material used	1,000	140	1,348
Cost per tons of material used	120	200	80
Manufacturing Expenses	30,800	25,760	18,100

Prepare an account for each process, showing the cost per ton of each product

Process A Account

Particular	ton	Rs.	Particular	ton	Rs.
To Raw material used (1000 X Rs. 200)	1000	1,20,000	By Loss in weight(2% of 1000 tons)	20	__
To Manufacturing expenses & Wages		30,800	By Sale of Scrap (100 ton X Rs. 100)	100	10,000
			By Transfer to warehouse cost Rs.160	220	35,200
			By Transfer to process B @ Rs. 160 per ton	660	1,05,600
	1000	1,50,800		1000	1,50,800

COST PER TON: - 1, 50,800-10,000 = Rs. 160 per ton

880 tons

Process B Account

Particular	ton	Rs.	Particular	ton	Rs.
To Process A A/c	660	1,05,600	By Loss in weight(2% of 800 tons)	16	--
To, Material	140	28,000	By Sale of Scrap (10% of 800 tons)	100	8,000
To Manufacturing expenses & Wages		25,760	By Transfer to warehouse @ Rs. 215	352	75,680
			By Transfer to Process C @Rs. 215 per ton	352	75,680
	800	1,59,360		800	1,59,360

COST PER TON: - 1, 59,360-8,000 = Rs. 215 per ton

704 tons

Process C account

Particular	ton	Rs.	Particular	ton	Rs.
To Process B A/c	352	75,680	By Loss in weight(2% of 1700 tons)	34	--
To, Material	1,348	1,07,840	By Sale of Scrap (10% of 1,000 tons)	170	3,400
To Manufacturing expenses & Wages		18,100	By Transfer to warehouse @ Rs. 132.50	1,496	1,98,220
	1,700	2,01,620		1,700	2,01,620

COST PER TON: - 2, 01,620-3,400 = Rs. 132.50 per ton

1,496 tons

(6) The process of a company passes though two processes A and B respectively . From past experience the percentage of loss, which is computed on the computer on the number of units entering the process concerned, is ascertained as under:

Process A 2% Process B 5%

The loss of each process has a scrap value. The wastages of process A is sold at Rs. 10 per 100 units and that of process B at Rs.20 per 100 units. The following information is available for the year ended 31st March 2007.

	Process A	Process B

	8,000	2,800
Materials consumed	12,200	14,000
Direct Wages	3,080	1,000
Manufacturing Expenses	Units	Units
	39,000	38,500
Finished Product		
Stock:	4,000	6,000
1st April 2004	3,000	8,000
31st March 2005		

40,000 units of crude materials were introduced in Process A at a cost Rs. 16,000. Stock valuation on April 1(per unit): Process A : Re 0.90; Process B : Re 1.47

Stock at 31st March is to be valued at the cost shown by the year's process accounts.

Prepare the necessary accounts

Solution:

Process A Account

Particular	unit	Rs.	Particular	unit	Rs.
To Unit Introduced	40,000	16,000	By Normal Wastage (2% of 40,000 units @ Rs.10 per 100 unit	800	80
To Material		8,000			
To Wages		12,200	By Abnormal Wastage	200	200
To Manufacturing expenses		3,080	By Process A Stock @ Rs. 1 per unit	39,000	39,000
	40,000	39,280		40,000	39,280

Process A Stock

Particular	units	Rs.	Particular	units	Rs.

To, Balance b/d @ Rs. 0.90	4000	3,600	By Process B A/c (Unit Transfer)	40,000	39,600
To, Process A A/c (transfer)	39,000	39,000	By Balance c/d @ Re. 1 per unit	3,000	3,000
	43,000	42,600		43,000	42,600

Process B account

Particular	unit	Rs.	Particular	unit	Rs.
To Unit Introduced	40,000	39,600	By Normal Wastage (5% of 40,000 units @ Rs.20 per 100 unit	2000	400
To Material		2,800	By Process B Stock @ Rs. 1.50 per unit	38,500	57,750
To Wages		14,000			
To Manufacturing expenses		1,000			
		750			
To Abnormal Effectives	500				
	40,500	58,150		40,500	58,150

Process B Stock

Particular	units	Rs.	Particular	units	Rs.
To, Balance b/d @ Rs. 1.47	6000	8,820	By Finished stock A/c	36,500	54,570
To, Process A A/c (transfer)	38,500	57,500	By Balance c/d @ Re. 1.50 per unit	8,000	12,000
	44,500	66,570		44,500	66,570

Calculation of cost of Abnormal Wastages and Abnormal Effectiveness: -

Process A: - Abnormal Wastages: - 39,200 X 200/ 39,200 = Rs.200

Process B: - Abnormal Effectiveness: - 57,000 X 500 / 38,000 = Rs.750

(7). The product of a manufacturing concern passes through two processes A and B and then to Finished Stock. It is ascertained on the basis of past experience that in each process 2% of the total weight put in is lost and 10% is scrap which from process A and B realises. Rs.100 per Kg and Rs.150 per Kg respectively.

The process figures are as follows:

	Process A	**Process B**
Materials consumed in Kg	Rs.	Rs.
Cost of material per Kg	1000	70
Wages	120	200
Manufacturing Expenses	17,500	10,000
	5,380	5,342

Prepare Process Accounts, showing the cost of the output of each process and the cost per Kg.

Solution:

Process A Account

Particulars	kg	Rs.	Particulars	Kg	Rs.
To Materials @Rs.120 per Kg	1,000	1,20,000	By Loss in Weight (2% of 1000Kg)	20 100	- 10,000
To Wages		17,500	By Sale of Scrap		
To Manufacturing Expenses		5,380	(10% of 1,000Kg	880	1,32,880
			By Process B A/c @ Rs.151 per kg		
	1,000	1,42,880		1,000	1,42,880

Process B Account

Particulars	Kg	Rs.	Particulars	Kg	Rs.
To Process A A/c (Transfer)	880	1,32,880	By Loss in Weight (2% of 950 kg)	19	-
To Materials Consumed	70	14,000	By Sale of Scrap	95	14,250
To Wages		10,000	(10% of 950 kg)		
To Manufacturing Expenses		5,342		836	1,47,972

			By Finished Stock A/c @ Rs.177 per kg		
	950	1,62,222		950	1,62,222

(8)On the basis of the following information prepare Process Accounts and a statement of Profit:

Particular	**Process I**	**Process II**	**Process III**
Raw Materials used	1,000 Ton		
Cost per ton	Rs.200		
Manufacturing Wages & Expenses	Rs87,500	Rs.34,500	Rs,10,710
Weight lost	5%	10%	20%
Scrap(Sales price Rs.50 per ton)	50 ton	30 ton	51 ton
Sale price output per ton	Rs.350	Rs.500	Rs.800

Management Expenses were Rs.17,500 and selling expenses Rs.10,000.Two third of the output of process I and one-half of the output of process II are transferred to next process and the balance are sold. The entire output of Process III is sold.

Solution:

Process I Account

Particulars	Ton	Rs.	Particulars	Ton	Rs.
To Raw materials used (1000 * Rs.200)	1,000	2,00,000	By Loss of Weight (5% of 1,000 Ton)	50	_
To Manufacturing Wages & Exp.	_	87,500	By Sale of Scrap (50 ton *Rs.50)	50	2,500
			By Transfer to Warehouse(1/3)	300	95,000
			By Process II A/c (2/3) @ Rs.316.67 per ton	600	1,90,000
	1,000	2,87,500		1,000	2,87,500

Process II Account

Particulars	Ton	Rs.	Particulars	Ton	Rs.
To Process I A/c	600	1,90,000	By Loss of Weight (10% of 600 ton)	60	_
To Manufacturing Wages & Exp.	_	34,500	By Sale of Scrap (30 ton * Rs.50)	30	1,500
			By Transfer to Warehouse(1/2)	255	1,11,500
			By Process III A/c(1/2)@ Rs.437.25 per ton	255	1,11,500
	600	2,24,500		600	2,24,500

Process III Account

Particulars	Ton	Rs.	Particulars	Ton	Rs.

To Process II A/c	255	1,11,500	By Loss of Weight	51	_
To Manufacturing Wages & Exp.	_	10,710	(20% of 255 Ton) By Sale of Scrap (51 Ton * Rs.50)	51	2,550
			By Transfer to Warehouse @Rs.782.09 per ton	153	1,19,660
	255	1,22,210		255	1,22,210

Statement of Profit

	Rs.	Rs.
Sales price of Output:		
Process I=300 Ton * Rs.350	1,05,000	
Process II=255 Ton * Rs.500	1,27,500	
Process III=153 Ton * Rs.800	1,22,400	3,54,900
Less: Cost of production in each Process:		
Process I=300Ton	95,000	
Process II=255Ton	1,11,500	
Process III=153 Ton	1,19,660	3,26160
	Gross Profit	28,740
Less: Management Expenses	17,500	
Selling Expenses	10,000	

	27,500
Net Profit	1,240

NUMERICAL QUESTIONS

Q1. A product passes through three processes. The normal wastages of each process is. Process A 3% Process Rs- 5% and process C- 8% the wastage of each process were sold at 0.25, 0.50 and Re 1/- Per unit respectively. 20,000 units were issued to process A at a cost of Re 1/- Per unit. The other expenses were as under:

	Process A	Process B	Process C
Rs Rs Rs			
Materials	2,000	3,000	1,000
Wages	10,000	16,000	13,000
Direct expenses	2,000	3,000	4,000
Actual output	19,000 units	18,200 units	16,200 units

Prepare process Account.

Q2. A product passes through there processes as X, Y and Z. The information is given as under:

	Process X	Process Y	Process Z
Raw Material	2,000 tons	-	-
Cost per ton	Rs 200	-	-
Manufacturing exp.	1,75,000	80,000	20,000

Weight of loss	5%	10%	20%
Scrap sold per ton	100	200	100
Sale price per ton	400	500	1000

2/3 of output of process X and ¼ output of process Y are passed to next process and balance are sold out. Prepare processes Account.

Q 3. From the following particulars, prepare Process X account showing the cost per tonne of output:

Materials in tonnes	1,000
Manufacturing expenses	Rs. 10,000
Wages	Rs. 26,000
Output in tonnes	830
Cost of material per tonne	125

It is ascertained that in .the process normally 5% of the total weight is lost and 10% is Scrap which realizes Rs. 80 per tonne. There was no stock or work-in-progress.

Q 4. A product passes through two processes. The output of Process I becomes the input of Process II and the output of Process II is transferred to Warehouse. The quantity of raw materials introduced into Process I is 20,000 kg at Rs. I0 per kg. The cost and output data for the month under review are as under:

	Process I	Process II
Direct materials	Rs. 60,000	Rs. 40,000
Direct labour	Rs. 40,000	Rs. 30,000
Production overhead	Rs. 39,000	Rs. 40,250
Normal loss	8%	5%
Output	Rs. 18,000	Rs. 17,400
Loss realization of Rs/unit	200	300

The company's policy is to fix the selling price of the end product in such a way as to yield `a profit of 20% on selling price.

Required:

(i) Prepare the Process Accounts

(ii) Determine the selling price per unit of the end product.

Q 5. Product B is obtained after it passes through three distinct processes. The following information is obtained from the accounts for the week ending 31st October, 2008:

Items	Total	Process		
		I	II	III
	Rs.	Rs.	Rs.	Rs.
Direct materials	7,542	2,600	1,980	2,962
Direct wages	9,000	2,000	3,000	4,000
Production overhead	9,000	-	-	-

1,000 units at Rs. 3 each were introduced to Process 1. There was no stock of material or work-in-progress at the beginning or at the end of the period. The output of each process passes direct to the next process and finally to finished stock.

Production overhead is recovered on 100% of direct wages. The following additional data are obtained:

Process	Output during the week	Percentage of normal loss to input	Value of scrap per unit
Process I	950 units	5%	Rs.2 /-
Process II	840	10%	4
Process III	750	15%	5

Prepare process cost accounts and abnormal gain or loss accounts.

Q 6. A product manufactured by the standard Chemicals Ltd. passes through three processes I, II and III. The following cost have been incurred for the month of September 2009:

	Process I	Process II	Process III
	(Rs.)	(Rs.)	(Rs.)
1. Materials Consumed	40,000	75,000	5,000
2. Direct Wages	22,500	10,000	10,000
3. Direct Expenses	20,500	2,250	2,505
Total Rs.	83,000	19,750	17,505
	Units	Units	Units
4. Output	3,900	3,850	3,200
5. Finished Process Stock:			
(i) 01-9-2009	600	550	800
(ii) 30-9-2009	500	800	Nil
6. Stock Valuation on 01.9.2008 (Rs. per unit)	24.50	31.00	37.00
7. Percentage of wastage	2	5	10
8. Net Realizable Value of wastage per unit (Rs.)	13.50	16.25	21.00

Four thousand units of raw materials were introduced in Process No. 1 at a cost of Rupees twenty thousand.

Stocks are valued and transferred to subsequent processes at weighted average cost. The percentage of wastage is computed on the number of units entering the process concerned.

Prepare (i) Process A/cs; (ii) Process Stock A/cs; (iii) Normal Wastage A/c: (iv) Abnormal wastage/Effective A/c.

Q 7. Product passes through three processes-A, B and C. The details of expenses incurred on the three processes during the year were as under:

Processes	A	B	C
Units introduced-	10,000		

Cost per unit	Rs. 100/-		
	Rs.	Rs.	Rs
Sundry materials	10,000	15,000	5,000
Labour	30,000	80,000	65,000
Direct expenses	6,000	18,150	27,200
Selling price per unit of output	120	165	250

Management expenses during the year were Rs. 80,000 and selling expenses were Rs. 50,000. These are not allocable to the processes.

Actual output of the three process was: A—9,300 units, B-5,400 units and C—2,100 units. Two-thirds of the output of Process A and one-half of the output of Process B was passed on to the next process and the balance was sold. The entire output of Process C was sold.

The normal loss of the three processes, calculated on the input of every process was: Process A-Wo, B-15% and C-20%. The loss of Process A was sold at Rs. 2 per unit, that of B at Rs. 5 per unit and of Process C at Rs. 10 per unit.

Prepare the three Process Accounts and the Profit and Loss Account.

Q 8. The following details are extracted from the costing records of an oil refinery for the week ended 30 September, 2008.

Purchase of 500 tonnes of copra Rs. 2,00,000.

	Crashing plant	Refinery plant	Finishing
Cost of labour	2,500	1,000	1,500
Electric power	600	360	240
Sundry material	100	2,000	—
Repairs to machinery and plant	280	330	140
Steam	600	450	450
Factory expenses	1,320	660	220
Cost of casks	—	—	7,500

300 tonnes of crude oil was produced.

250 tonnes of oil was produced by refining process.

248 tonnes of refined oil was finished for delivery.

Copra sack sold Rs. 400.

175 tonnes of caprin residue sold Rs. 11,000.

Loss in weight in crushing 25 tonnes.

45 tonnes by-product was obtained from refining process valued at Rs. 6,750. You are required to show the accounts in respect of each of the following stages of manufacture for the purpose of arriving at the cost per tonne of each process and also the total cost per tonne of finished oil.

(a) Copra crushing process, (b) Refining process, (c) Finishing process.

LESSON 15
COSTING OF JOINT PRODUCT AND BY PRODUCT

CONTEXT OF THE LESSON

In case of processing industry some time more than one products are produced from the common raw material which are classified into joint products or by-products on the basis of significance of their value. In this lesson we will deal with the criteria for differentiating between joint products and by products and the method of costing of these products.

OBJECTIVES OF THE LESSON

INTRODUCTION

A manufacturing organization which deals in multi-product/ multi-process and multi service industries are always uncertain on one of the major issue of identifying and allocating and apportioning joint cost or common costs to various products or output services. The final product/service cost will reflect the full cost only if the joint/ common costs are allocated or apportioned on some suitable basis to the individual final products. The problem of allocation and apportionment of common or joint costs becomes more significant in process industries, where there is common process being applied up to a certain stage and then segregates into two or more process lines to produce more than one product from a common initial process.

The essence of joint product/by-product costing lies in the allocation/apportionment of joint processing costs to the individual products in an equitable manner as possible. The ascertainment of joint costs is very much essential for valuation of work-in-progress inventory, external financial reporting and for the purposes of valuation under various statutory and tax legislations. It is necessary to understand the cost practices for the apportionment of joint costs to individual products in the cost statements in case of those industries where a product has to pass through various process in order to become a finished product.

Following are some examples of the industry where more than one product are produced simultaneously through various process with their joint products:

Coal mining washing and Coke production resulting in the production of Coal, Coke, Gas, Benzene, and Tar and Ammonia.

Petroleum refining resulting in the production of Petrol, Kerosene, Diesel, Furnace oil etc. In this industry a very large number of joint and by-products occur in cracking or refining crude oil.

Agricultural Product industries such as vegetable oil - crushing of oil seeds resulting in production of oil and cake. From the process of refining oil, soap stock arises which could be further processed into soap and allied products. The refined oil can be further hydrogenated to produce Vanaspati.

In sugar industry, the three by-products are bagasse, molasses and pressmud.

In Milk industry , the three joint products are Cream, Liquid Milk and Skim. The cream is again processed into Butter and ghee. The liquid milk and skim is processed to produce whole milk, full cream milk and standard milk.

Chemical industry: Processing of naphtha results in Ethylene, Propylene, Methane, Ethane, Butane etc.

Terminology

Joint-Products:.

Multiple products deriving out of same raw materials through a common process simultaneously which have substantial market value is termed as joint product

Two or more products separated in the course of processing, each having a sufficiently high saleable value to merit recognition as a main product.

Example: Ethylene and Propylene arising from the cracking of Naphtha

By-Product:

A product, which is secondary to the main product and obtained during the course of manufacture of recognized main product. It is called a by-product because it is less significant as compared with the main product or products.

A product which is produced incidentally from the material used in the manufacturing of main products, having either a net realizable value or a usable value which is relatively low in comparison with the saleable value of the main products is termed as by product.

By-product may be subjected to further processing after separation from the main product, if such processing will increase the value added or promote the sale of the main product. It is called a by-product because of the relatively lower importance or lower market value or lower ultimate value at the end of the value chain it has, compared with the main product or products.

Example: Groundnut crushing in which oil is the main product and cake is a by-product. Cake is used as raw material for manufacture of cattle feed.

The productions of the by-products are incidental to the production of main product. A by-product may get promoted to the status of joint product if the market perception changes or a joint product could be relegated it the position of a by-Product in future. The classification could vary over a period time. For example, in a Petroleum Refinery, gas was earlier considered as a by-product. Now, it has assumed importance like petrol, diesel, etc. and it is being treated as a joint product.

Split off point:

It is the stage in the manufacturing process where joint products are separated and can be identified as separate product.

Scrap:

Scraps are discarded material which has some recovery value and are either disposed of without further treatment (other than reclamation and handling), or reintroduced into the production process in place of raw material.

Waste:

The discarded material or substances having no significant value (as distinct from scrap) is treated as waste.

Joint Costs:

Joint Costs are the common cost of facilities or services employed in the output of two or more simultaneously produced or otherwise closely related operations, commodities or services. The costs incurred in the joint process cannot be separately traced to the individual product outputs. The specific feature of joint products is that they incur joint costs up to the stage of production, known as the split-off point, when they become recognisable as separate products. The costs incurred in the joint process cannot be separately traced to the individual product outputs.

Separate cost or Separable cost:

Any cost incurred after the split off point e.g. the additional processing costs, which can be identified with specific products may be termed separate costs. For a cost to be treated as separate cost, it must be possible to trace it with reasonable certainty to a single product.

Costing Principles for Joint Product / By-product costing:

There are two basic principles or approaches for costing of joint product and by-products, which are as follows:

Joint Product Approach:

More than one product is treated as joint product under this approach and the joint processing costs are allocated between the products on an appropriate basis.

Main Product / By-product Approach:

Only one product is considered as a main product under this approach and all other products arising from the process will be treated as by-products.
In this approach, the joint costs are not allocated between the products but the amount of sales revenue (sales value less further processing expenses, selling expenses, etc. if any)

realised from the products is credited to the joint costs and the remaining joint cost is totally absorbed by the main product.

Recognition of a Product as Joint Product or By-Product

Whether a product is to be recognised as a joint product or by-product, in this regard there is no specific rules or guidelines. Products which are incidental to the production of main products and products which are insignificant in value compared to the main product are treated as by-products. However, the status of a product may change from by-product to main product or vice versa due changes in market price, competition, demand or technology and thus may require a re-classification. Therefore, the classification between the main product and by-product has to be reviewed continuously. Recognition of joint products and by-products is purely by relative commercial values. Further, such relative values are not permanent as their relative importance of joint and by-products is evanescent in nature.

Methods of Apportionment of Joint Costs

The following are the methods which are used for the apportionment of Joint cost:

Market Value Bases:

The total joint cost of production is apportioned among the joint products on the basis of their relative sales value in this method.

The fundamental principle of this method is that joint products should absorb joint costs according to their ability to pay as reflected by the market values of the individual products.

The market value or the sales value for the purpose of joint cost can be as follows-

(i) Market value after further processing i.e. the final sales value.

(ii) Net Realisable value i.e. the final sales value less the further processing costs.

(iii) Gross Margin Percentage.

(iv) Market value at the point of separation.

(i).Market value after further processing i.e. the final sales value:

When there is a wide parity in selling prices of final products, this base is to be adopted. While choosing a selling price, it is important to choose a representative period considering the normal cycle of fluctuations which may be the daily average of the past month or

quarterly average or any suitable period.

Example 1

Joint production cost of the Products

	Total	**Prod A**	**Prod B**	**Prod C**
Raw Materials	1,20,000			
Chemical	10,000			
Labour	50,000			
Manufacturing overhead	45,000			
	2,25,000			
Apportioned on the basis of use of services				
- Administration Overhead	25,000	10,000	10,000	5,000
- Selling & Distribution Overheads	30,000	15,000	5,000	10,000
Total cost	2,80,000			
i) Unit produced	1150	400	400	350
ii) Sales Price per unit (Rs)		250	300	200
iii) Sales Value (Rs)	2,90,000	1,00,000	1,20,000	70,000
iii)Joint production cost apportioned on the basis sales value (Rs)	2,25,000	77,586	93,104	54,310
iv) Administration overhead (Rs)	25,000	10,000	10,000	5,000
v) Selling & Dist. Overheads (Rs)	30,000	15,000	5,000	10,000
vi) Total Cost	2,80,000	1,02,586	108,104	69,310
iv) Cost per Unit		256.47	270.26	198.03

(ii). Net Realisable value i.e. the final sales value less the further processing costs: If a product require further processing after split-off point, then the further processing cost has to be determined and deducted from the sales value to arrive at the basis for apportionment

of joint cost among the products.

Example 2

Apportionment of joint costs on the basis of net realisable value

	Total	Prod. A	Prod.B	Prod.C
I. Units produced	1150	400	400	350
II. Sale Price per unit (Rs.)		300	350	200
III. Sale Value	3,30,000	1,20,000	1,40,000	70,000
IV. Further Processing Cost	22,000	10,000	12,000	--
V. Net Realisable Value	3,08,000	1,10,000	1,28,000	70,000
VI. Joint Cost Apportioned on the Basis of V (35.71%, 41.56%, 22.73%)	2,25,000	80,357	93,507	51,136
VII. Administration Overhead	25,000	10,000	10,000	5,000
VIII. Selling & Distribution Overhead	30,000	15,000	5,000	10,000
IX. Total Cost	2,80,000	1,05,357	1,08,506	66,136
X. Joint Cost Per Unit		200.89	233.77	146.10
XI. Further Processing Cost Per Unit		25.00	30.00	
XII. Cost Per Unit Of Finished Goods		225.89	263.77	146.10

(iii). Gross Margin Percentage: When the products have same profitability on sales, Joint costs shall be allocated on the basis of Gross Margin Percentage

Example 3

(iii).Apportionment of Joint Cost on the Basis of Gross Margin Percentage.

	Total	Prod A	Prod B	Prod C
Unit produced	1150	400	400	350
Sales Price per unit (Rs)		300	350	200
Sales Value (Rs)	3,30,000	1,20,000	1,40,000	70,000
Joint cost	2,25,000			
Further Processing Cost	22,000			

Gross Margin	83,000			
Gross Margin Percentage	25%			
Deduct Gross Margin @ 25%	83,000	30,000	35,000	18,000
Cost of Goods Sold	2,47,000	90,000	1,05,000	52,000
Less: Further Processing Cost	22,000	10,000	12,000	-
Joint Cost Allocated	2,25,000	80,000	93,000	52,000

The obvious assumption in this method is that all the products have the same profitability ratio on sales.

(iv). Market value at the point of separation:

Joint costs apportionment on the basis of sales value of the products shall be followed when no other rational basis for apportionment of joint cost is available and joint products are sold without further processing at split off point.

Physical unit base method

Where individual products are from a common input, and none of the products can be categorised as by-product, the benefits received by individual products from the common input is to be measured by physical units e.g. weight, length, volume, etc. The joint costs are to be allocated to individual products on the basis of this measurement.

Example 4:

Joint production cost of the Products:

	Total	**Prod A**	**Prod B**	**Prod C**
Raw Materials	1,20,000			
Process Chemical	10,000			
Employees cost	30,000			
Production Overhead	40,000			
	2,00,000			
Apportioned on the basis of use of services				
- Administration Overhead	15,000	40%	30%	30%
- Selling & Distribution Overheads	20,000	20%	40%	40%

Total cost	2,35,000			

	Total	**Prod A**	**Prod B**	**Prod C**
i) Unit Produced (No)	1,00,000	50000	30000	20000
ii) Joint production cost apportioned on the basis of Units of production (Rs)	2,00,000	1,00,000	60,000	40000
iii) Administration overhead (Rs)	15,000	6,000	4,500	4,500
iv) Marketing expenses (Rs)	20,000	4,000	8,000	8,000
v) Total Cost	2,35,00	1,10,000	72,500	52,500
iv) Cost per Unit (Rs)		2.20	2.42	2.63

Treatment of cost of by-products:

The by-products are normally additional output in the production of main products. The standardization of treatment of by-product costs is important from the point of cost accounting.

The uniform system of treatment of cost accounting for by-product shall be followed. **Sales value of by-products less further processing cost, administrative expenses and selling and distribution expenses shall be credited to the total cost of main product**.

Example 5

Joint Cost Rs 2, 80,000

Sales value of by-product Rs 15,000

Less: Further processing cost. Rs. 3,000

Administration & selling and Rs 2,000

Distribution Cost ----------

Amount to be credited to Joint Cost Rs 10,000

Joint Cost to be apportioned among joint products Rs 2, 70,000

NUMERICAL ILLUSTRATIONS

1 In a manufacturing concern in a certain product A yield by-products B and C. The joint expenses of the manufacture are:

Material Rs. 10,200 Labour Rs. 11,500 and On cost Rs. 7,500

Subsequent expenses are as under:

Particular	**A**	**B**	**C**
Material	2,500	1,200	1,400
Labour	1,900	1,600	2,000
Oncost	1,500	900	1,050
Total	5,900	3,700	4,450

Selling prices are: A = 30,000; B = 20,000 C = 15,000. Estimated profits on turnover are A = 40% B = 30% C = 25%.

Show how would you apportion the joint expenses of manufacture and prepare necessary accounts.

Solution: -

Apportionment of joint Expenses

Particular	**A**	**B**	**C**
Selling Price	30,000	20,000	15,000
Less: Estimated Profit	12,000	6,000	3,750
Total cost	18,000	14,000	11,250
Less : Total Separate Expenses	5,900	3,700	4,450
Share in Joint Expenses(Rs29,000)	12,100	10,300	6,800

A (Main Product) Account

Particular	**Amount**	**Particular**	**Amount**
To Joint Expenses			
Material	10,200	By By-product B	10,300
Labour	11,500	By By-product C	6,800
Oncost	7,500	By Balance c/d	12,100
	29,200		29,200

To Balance c/d	12,100		
To Separate Expenses			18,000
Material	2,500	By Cost of Production	
Labour	1,900		
Oncost	1,500		
	18,000		18,000
To Cost of Production	18,000		30,000
To Profit	12,000	By Sales	
	30,000		30,000

B (By-Product) Account

To A (Main Product) A/c	10,300		
To Material	1,200	By Cost of Production	14,000
To Labour	1,600		
To Oncost	900		
	14,000		14,000
To Cost of Production	14,000	By Sales	20,000
To Profit	6,000		
	20,000		20,000

C (By-Product) Account

To, A (Main Product) A/c	6,800		
To Material	1,400	By Cost of Production	11,250
To Labour	2,000		
To Oncost	1,050		
	11,250		11,250

To Cost of Production	11,250	By Sales	15,000
To Profit	3,750		
	15,000		15,000

2. A factory providing articles X also Y and Z as by product. The joint cost of manufacturing is:

Material	10,000
Labour	2,000
Factory and office Overhead	8,000
Total	**20,000**

Subsequent separate costs are as under:

Particular	**A**	**B**	**C**
Material	1,500	1,300	1,000
Labour	200	150	100
Factory and office Overhead	800	550	400
Total	**2,500**	**2,000**	**1,500**
Sales value	20,000	15,000	10,000
Estimated profits on sales value	30%	25%	20%

Assume that selling and distribution expenses are in proportion to sales value.

Show how you would propose to apportion the joint cost f manufacture and prepare the necessary accounts of X, Y and Z

Solution:

Apportionment of joint Expenses

Particular	**X**	**Y**	**Z**	**Total**
Sales	20,000	15,000	10,000	45,000
Less: Profit	6,000 (30%)	3,750 (25%)	2,000 (20%)	11,750
Total cost	14,000	11,250	8,000	33,250
Less : Total Separate Expenses	2,500	2,000	1,500	6,000
Share in Joint Expenses(Net Value)	11,500	9,250	6,500	27,250

The difference between Rs. 27,250 and in joint cost of Rs. 20,000, i.e., Rs. 7,250 is that of selling and distribution cost which is further apportioned in the ratio of sales values n the three products as under:

Particular	**X**	**Y**	**Z**	**Total**
Estimated joint cost	11,500	9,250	6,500	27,250
Less: selling and distribution cost Share in joint cost	3,222	2,417	1,611	7,250
	8,278	6,833	4,889	20,000

X (Main Product) Account

Particular	**Amount**	**Particular**	**Amount**
To Joint Expenses			
Material	10,000	By By-product Y	6,833
Labour	2,000	By By-product Z	4,889
Factory and office Overhead	8,000	By Balance c/d	8,278
	20,000		20,000
To Balance c/d	8,278	By Sales	20,000
To Separate Expenses			
Material	1,500		
Labour	200		
Factory& office Overhead	800		
To Selling and Distribution	3,222		
To Profit	6,000		
	20,000		20,000

Y (By-Product) Account

To X (Main Product) A/c	6,833	By Sales	15,000
To Material	1,300		
To Labour	150		
To Fact.& office Overhead	550		
To Selling and Distribution	2,417		
To Profit	3,750		
	15,000		15,000

Z (By-Product) Account

To X (Main Product) A/c	4,889	By Sales	10,000
To Material	1,000		
To Labour	100		
To Factory and office Overhead	400		
To Selling and Distribution	1,611		
To Profit	2,000		
	10,000		10,000

3 Product P yields by-product Q and R. The joint expenses and subsequent expenses are as follows :

Particular	**Joint expenses Rs.**	**Subsequent expenses**		
		P	**Q**	**R**
Material	10,000	2,000	1,600	1,800
Labour	8,000	2,400	1,400	1,700
On cost	9,000	2,600	1,000	1,500
	27,000	7,000	4,000	5,000
Sales		42,000	20,000	18,000
Percentage of profit on sales		50%	50%	33.1/3%

Show how you would apportion the joint expenses and prepare the necessary accounts.

Solution:

Statement of Apportionment of Cost

Particular	**P** **Rs.**	**Q** **Rs.**	**R** **Rs.**
Sales	42,000	20,000	18,000
- Profit (50%, 50%, 331/3%)	21,000	10,000	6,000
Total	21,000	10,000	12,000
-Post Separation Cost(Total)	7,000	4,000	5,000
Joint cost to be Apportioned	14,000	6,000	7,000
Ratio	14:	6:	7
Material	$10{,}000 \times \frac{14}{27} = 5{,}185$	$10{,}000 \times \frac{6}{27} = 2{,}222$	$10{,}000 \times \frac{7}{27} = 2{,}593$
Labor	$8{,}000 \times \frac{14}{27} = 4{,}185$	$8{,}000 \times \frac{6}{27} = 1{,}778$	$8{,}000 \times \frac{7}{27} = 2{,}074$
O.H	$9{,}000 \times \frac{14}{27} = 4{,}667$	$9{,}000 \times \frac{6}{27} = 2{,}000$	$9{,}000 \times \frac{7}{27} = 2{,}333$

P Account

Particular		Amount	Particular	Amount
To Joint Cost			By Sales	42,000
Material	5,185			
Labor	4,148			
O.H.	4,667	14,000		
To Separate Cost:				
Material	2,000			

Labor 2,400 O.H. 2,600 To Profit (50% of 42,000)	7,000 21,000		
	42,000		42,000

Q Account

Particular	Amount	Particular	Amount
To Joint Cost Material 2,222 Labor 1,778 O.H. 2,000 To Separate Cost: Material 1,600 Labor 1,400 O.H. 1,000 To Profit (50% of 20,000)	6,000 4,000 10,000	By Sales	20,000
	20,000		20,000

R Account

Particular	Amount	Particular	Amount

To Joint Cost		By Sales	18,000
Material 2,593			
Labor 2,074			
O.H. 2,333	7,000		
To Separate Cost:			
Material 1,800			
Labor 1,700			
O.H. 1,500	5,000		
To Profit (50% of 18,000)	6,000		
	18,000		18,000

4. Three products, viz, Nima, Bima, Rima are prepared out of a single process. The joint expenses are: Material Rs. 2, 20,000; Labour Rs. 1, 00,000 O.H. Rs. 80,000. Post separation is:

Particular	**Nima**	**Bima**	**Rima**
Other Material	30,000	20,000	15,000
Labour	20,000	30,000	10,000
O.H.	5,000	6,000	5,000
	55,000	56,000	30,000
Sales value	5,00,000	3,00,000	2,00,000
Profit on Sales	50%	30%	25%

Prepare statement showing apportionment of joint expenses, and Account for each product.

Solution: Statement of Apportionment of Cost

Particular	Nima	Bima	Rima	Total
Sales	5,00,000	3,00,000	2,00,000	
- Profit (50%, 30%, 20%)	2,50,000	90,000	50,000	
Total	2,50,000	2,10,000	1,50,000	

- Post Separation Cost(Total)	55,.000	56,000	30,000	
Cost before selling expenses	1,95,000	1,54,000	1,20,000	4,69,000
-Selling expenses (Note)	34,500	20,700	13,800	69,000
Joint cost to be apportioned	1,60,500	1,33,300	1,06,200	4,00,000

Ratio	**1,605**	**1,333**	**1,062**
Material	$\frac{1,605}{4,000} \times 2,20,000 = 88,275$	$\frac{1,333}{4,000} \times 2,20,000 = 73,315$	$\frac{1,062}{4,000} \times 2,20,000 = 58,410$
Labour	$\frac{1,605}{4,000} \times 1,00,000 = 40,125$	$\frac{1,333}{4,000} \times 1,00,000 = 33,325$	$\frac{1,062}{4,000} \times 1,00,000 = 26,550$
O.H.	$\frac{1,605}{4,000} \times 80,000 = 32,100$	$\frac{1,333}{4,000} \times 80,000 = 26,660$	$\frac{1,062}{4,000} \times 80,000 = 21,240$

Nima Account

Particular		Amount	Particular	Amount
To Joint Cost			By Sales	5,00,000
Material	88,275			
Labour	40,125			
O.H.	32,100	1,60,500		
To Separate Cost:				
Material	30,000			
Labour	20,000			
O.H.	5,000	55,000		
To Selling Expenses		34,500		
To Profit (50% of 5,00,000)		2,50,000		
		5,00,000		5,00,000

Bima Account

Particular		Amount	Particular	Amount
To Joint Cost			By Sales	3,00,000
Material	73,315			
Labour	33,325			
O.H.	26,660	1,33,300		
To Separate Cost:				
Material	20,000			
Labour	30,000			
O.H.	6,000	56,000		
To Selling Expenses		20,700		
To Profit (30% of 3,00,000)		90,000		
		3,00,000		3,00,000

Rima Account

Particular		Amount	Particular	Amount
To Joint Cost			By Sales	2,00,000
Material	58,410			
Labor	26,550			
O.H.	21,240	1,06,200		
To Separate Cost:				
Material	15,000			
Labor	10,000			
O.H.	5,000	30,000		
To Selling Expenses		13,800		
To Profit (25% of 3,00,000)		50,000		
		2,00,000		2,00,000

SELF CHECK QUESTIONS

1. What do you mean by joint cost? Discuss the method of apportionment of joint cost?
2. Diffrenceate between joint product and by product and discuss the method of costing of joint product.
3. What do you mean by- product? Discuss the method of costing of by product?

NUMERICAL QUESTION

Q.1.Product A yields bye-products B and C and the joint expenses of manufacture are:

Particular	A	B	C
Materials	8,000	4,000	2,000
Labour	4,000	3,000	1,000
On Cost	600	500	500
	12,600	7,500	3,500
Selling Price	51,000	21,000	10,000
Estimated profit on sale	40%	30%	20%

Show the manner in which you would apportion the joint expenses of manufacture. Also prepares accounts showing cost of each product.

Ans. Share in joint expenses A Rs.18,000;B Rs.7,200;and C Rs.4,500;Cost of Production A Rs.30,600;B Rs.14,700,and C Rs.8,000.

Q.2.In a manufacturing concern a certain product A yields bye-products B and C. The joint expenses of the manufacture are: Materials Rs.8,500;Labour Rs.9,000 and Overheads Rs.7,500.Subsequent expenses are as follows.

Particular	A	B	C
Materials	2,500	1,200	1,400
Labour	1,900	1,600	2,000
Overhead	1,500	900	1,050
	5,900	3,700	4,450
Selling Price	30,000	20,000	15,000
Estimated profit on turnover	40%	30%	25%

Show how would you apportion the joint expenses of manufacture and prepare the accounts.

Ans. Apportionment of joint expenses: A Rs.10, 360, B Rs.8,818, C Rs.5,822

Q.3.The joint products X,Y and Z are produced from a common process. The joint expenses of manufacture are:

	Rs.
Material	57,000
Labour	30,000
Overhead	2,100
Total	89,100

Subsequent expenses are as follows

	X	Y	Z
	Rs.	Rs.	Rs.
Materials	24,000	12,000	6,000
Labour	12,000	9,000	3,000
Overhead	1,800	1,500	1,500
Total	37,800	22,500	10,500
Sales	1,53,000	63,000	30,000
Estimated profit on sale	40%	30%	20%

Show the manner in which you want to apportion the joint expenses of production.

Ans. Joint expenses will be apportioned in the ratio of 20:8:5; Total Cost A-Rs.91, 800, B-Rs.44, 100 and C-Rs.24, 000.

Q.4.A Factory producing article A also yields B and C as by-products. The joint cost of manufacture is:

	Rs.
Materials	10,000
Labour	2,000
Overheads	8,000
Total	20,000

Subsequent costs are as follows:

	A	B	C
	Rs.	Rs	Rs.
Materials	1,500	1,300	1,000
Labour	200	150	100
Overheads	800	550	400
	2,500	2,000	1,500
	30,000	24,000	20,000
Selling Price	30%	24%	20%
Estimated Profits on Selling Prices			

Show how you would propose to apportion the joint costs of manufacture and prepare the necessary statement in respect of A, B and C.

Ans. Share in joint cost of manufacture; A Rs.6, 743; B Rs.6, 595; C Rs.6, 662