மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI – 12

தொலைநிலை தொடர்கல்வி இயக்கம்

DIRECTORATE OF DISTANCE & CONTINUING EDUCATION

BBA – SECOND YEAR

COST ACCOUNTING

COSTACCOUNTING

COURSE OBJECTIVES:

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- To provide basic knowledge on cost concepts
- To impart knowledge on accounting techniques useful in managerial functions.
- To enable the students to ascertain the cost control methods and the ascertainment of theprofitability of activates planned

COURSE OUTCOMES:

CO1: Prepare cost sheet to ascertain total cost and cost/ unit in order to prepare quotation

CO2: To differentiate methods of calculating material consumption

CO 3: Apply various labor control Techniques for cost reduction and smooth functioning of business.

CO4: Explain meaning of Overheads. Classify, Allocate, Apportion and Reapportion various overheads to calculate cost.

CO 5: Apply costing methods and costing techniques appropriately

UNIT-1: INTRODUCTION TO COST ACCOUNTING

Cost Accounting -Meaning of Cost, Costing and Cost Accounting. Comparison between Financial Accounts and Cost Accounts-Application of Cost Accounting-Cost Concepts -Cost Unit-Cost Centre-Elements of Costs-Preparation of Cost Sheet.

UNIT-2: MATERIAL COSTING

Classification of Materials-Material Control-Purchasing Procedure-Store Keeping-Techniques of Inventory Control-Setting of Stock Levels- EOQ Method of Pricing- Materials Issues - LIFO-FIFO - Weighted Average Method- Simple Average Method.

UNIT-3: LABOUR COSTING

Control of Labour Cost -Labour Turnover – Method of wage payments - Remuneration and Incentives - Time Rate System - Piece Rate System - Premium and Bonus Plans.

UNIT-4: OVERHEAD COST CONTROL

Meaning- Classification-Procedure - Allocation and Apportionment- Principles of Apportionment -Reapportionment, Direct, Step, Reciprocal, Simultaneous Equation Trial and Error.

UNIT-5: TECHNIQUES OF COSTING

Unit costing, Job Batch costing, Contract costing, Process Costing-excluding inter process profits.

(Marks: Theory 40% and Problems 60%)

TEXT BOOKS:

Jain, S.P. & Narang, Cost Accounting: Principles & Methods - K.L.-Kalyani Publishers

M.N. Arora, A Text Book of Cost Accountancy - Vikas Publishing Pvt. Ltd.

REFERENCE BOOKS:

R.S.N.Pillai&Bagavathi, Management accounting- S.Chand, New Delhi.

N.P.Srinivasan & M.Sakthivel Murugan, Accounting For Management- S.Chand, New Delhi

S.Pandian, Accounting for Managers, Ane Book Pvt.Ltd, New Delhi

S.N. Maheshwari, Studies in Cost Management- Sultan Chand & Sons

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LEARNING MATERIAL PREPARED BY

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COST ACCOUNTING

UNIT: 1 INTRODUCTION TO COST ACCOUNTING

COST ACCOUNTING -MEANING OF COST, COSTING AND COST ACCOUNTING. COMPARISON BETWEEN FINANCIAL ACCOUNTS AND COST ACCOUNTS-APPLICATION OF COST ACCOUNTING-COST CONCEPTS -COST UNIT-COST CENTRE-ELEMENTS OF COSTS-PREPARATION OF COST SHEET

INTRODUCTION:

Today business is a dynamic organism. Every businessman has to face tough competition, uncertainty and risk prevailing in the trade. A business may be altered because of technological development, economic situation, political changes social considerations etc. Increase in population may be turned into more demand, and thus new enterprises take birth to meet the demands. when many enterprises come up, there arises widespread competition, and this will cause the business more and more complex. Thus, the sellers must be ready to face survival situation and stiff competition. In the ordinary situation of business, in the past, the businessman or the entrepreneur was in close touch with his customers and suppliers. He was able to have a close observation and also measure the efficiency of his business. But, when the business grows in size and begins to function through stiff competition, uncertainty and risk, the businessman has to divert his attention to the problems of policies. It is possible only by delegating some of his authority to his subordinates. A busy businessman looks into the accounting information. The accounting information – profit and loss account and balance sheet – is aimed to serve the interests of owners, shareholders, bankers, agencies, government etc. the proprietors, who invest money can be satisfied when they know the income accruing to them; the law of a country also needs such financial statements. thus, financial accounting is mainly concerned with external reporting.

Every businessman tries to reduce the cost of manufacture to the minimum in the stage of complexity and competition more particularly in the large – scale production. therefore, the businessman looks for information to study the cost of a manufacture in the past, and on this basis, he assesses what it will cost in the future. Therefore, more importance is given to profit and loss account, which is prepared on the cost principle.

MEANING OF FINANCIAL ACCOUNTING:

The field of financial accounting is mainly concerned with the final preparation of profit and loss account and balance sheet_ profit and loss account show the net result of the transaction and balance sheet shows the financial position of the concern. These statements are helpful to the management to have an overall control on major function of the business finance, production, distribution etc. In the words of head kings, "the ordinary trading account is a locked storehouse of most information to which cost system is the key". The financial accounting does not give details regarding the operating efficiency of the concern.

LIMITATION OF FINANCIAL ACCOUNTING

The following deficiencies of financial are the causes for the development of cos accounting:

1. Financial accounting discloses only the net results of the overall activities of business; but i dos not reveal the profit of each department, process, products, jobs, etc

2. Materials and supplies are not properly controlled; as such deterioration, misappropriation, obsolescence, loss from scarp, defectives etc. Are the consequences.

3. Labour charges and wages are not recorded by jobs, department, or services; and as such no interpretation is possible in the light of costing systems.

4. Expenses are not classified as to the direct and indirect items; and they are not assigned to each job to controllable and uncontrollable items in overhead costs.

5. There is no well-developed system of standards to measure the efficiency of the organization in the use of materials   and other resources.

6. Financial accounting is a historical data, summarized at the end of the accounting period; and as such no up –to –date cost information is available to the management to make effective plan for the succeeding year.

7. It is not a guide in determining the prices of products, services, jobs etc. Because cost information is not available.

8. It does not give complete information of losses due to idle time, idle plant and equipment, defective materials; moreover, such losses or not distinguished into normal and abnormal wastes or losses.

9. Cost reduction is not possible to maximise profits, as the financial accounting does not disclose factors responsible to rise or fall in the cost of production.

10. As it does not give data, no comparison can be made either of two periods or of two firms.

11. Detailed or adequate information is not available from financial records for reports to outside agencies _ banks, credit association, government and for the purpose of comparison with other periods or firms.

12. It does not guide the management for proper planning, control and decision-making, as the financial accounting is maintained only to find out the trading results during a period.

MANAGEMENT ACCOUNTING

"Management accountancy is the term used to describe the accounting methods, systems and techniques, which coupled with special knowledge and ability, assist he management in its task of maximizing profits or minimizing loses. Management accounting, cost accountancy and all aspects of financial management". It reports not only historical data but also estimates for future. The management accountancy usually performs the advisory function of an expert. the management accountancy usually, being a member of top management, enjoys a higher status then that of a cost accountant.

COST ACCOUNTING Vs MANAGEMENT ACCOUNTING

Cost Accounting	Management Accounting
1.The cost accountant is primarily concerned with the ascertainment of cost and profitability and with the control of costs through budgetary control, standard costing etc.	1.The management accountant is concerned with al such matters in a wider perspective which go to assist the management in the formulation of policies, improvement of productivity, profitability etc.

2. Cost accounting evolved out of financial accounting.	2. Management accounting evolved out of cost accounting.
3. Cost accountant suggests to the management the best of the alternatives by use of differential cost method.	3. Management accountant takes into consideration the other non-cost factors also while deciding upon alternatives.
4.cost accounting provides just cost information for managerial purpose	4. Management accounting provides all accounting information. It utilizes the principles and practices of cost accounting and financial accounting in the best interests of the business.

COSTING

Costing is different from cost accounting. It is referred to "as classifying, recording and appropriate allocation of expenditure for the determination of the costs of products or services". Costing is the technique and process of ascertaining cost. The technique means and consists of principles and rule which govern the procedure of ascertaining costs of a product or service. The technique is not static, and it changes with the change of time. The process of costing "is the day-to-day routine of ascertaining costs, whatever the costs ascertaining may be and whatever be the means by which the costs or determined. Cost accountancy provides the basis and information for the ascertainment of costs; costing can be carried out arithmetically.

COST ACCOUNTING

The Institute of Cost and Works Accountants, U.K. defines "Cost Accounting as the application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control and ascertainment of profitability. It includes the presentation of information derived therefrom for the purpose of managerial decision-making". The Institute of Cost and Works Accountants, India defines "Cost Accounting is the technique and process of ascertainment of costs. Cost accounting is the process of accounting for costs, which begins with recording of expenses or the bases on which they are calculated and ends with preparation of statistical data." Cost Accounting is defined as the body of concepts, methods and procedures used

to measure, estimate the costs, profitability and performance of individual products, departments and other segments of a company's operations, for either internal or external use or both, and to report on these questions to the interested parties. Thus, there are three main divisions of cost accounting cost ascertainment, cost presentation and cost control.

OBJECTIVES OF COST ACCOUNTING

- **Ascertainment of Cost:**

It enables the management to ascertain the cost of product, job, contract, service or unit of production so as to develop cost standard. Costs may be ascertained, under different circumstances, using one or more types of costing principles-standard costing, marginal costing, uniform costing etc.

- **Fixation of Selling Price:**

Cost data are useful in the determination of selling price or quotations. A part from cost ascertainment, the cost accountant analyses the total cost into fixed and variable costs. This will help the management to fix the selling price; sometimes, below the total cost but above the variable cost. This will increase the volume of sales- more sales than previously, thus leading to maximum profit. The scientific way of reducing the prices is possible in an industry only where a sound costing system exists. In other words, cost reduction, in the absence of a costing system, may cause to shut down the industries.

- **Cost Control:**

The object is to minimum the cost of manufacturing. Comparison of actual cost with standards reveals the discrepancies-variances. If the variances are adverse, the management enters into investigation so as to adopt corrective action immediately.

- **Matching Cost with Revenue:**

The determination of profitability of each product, process, department etc. Is the important object of costing.

- **Special Cost Studies and Investigations:**

It undertakes special cost studies and investigations and these are the basis for the management in decision-making or policies. This will also include pricing of new products, contraction or expansion programs, closing down or continuing a department, product mix, price reduction in depression etc.

- **Preparation of Financial Statements, Profit and Loss Account, Balance Sheet:**

To prepare these statements, the value of stock, work-in-progress, finished good etc. are essential; in the absence of the costing department, when we have to close the accounts, it rather takes too much time. But a good system of costing facilitates the preparation of the statements, as the figure are easily available; they can be prepared monthly or even weekly.

FUNCTIONS OF COST ACCOUNTING

1. To serve as a guide to price fixing of products.

2. To disclose sources of wastage in process of production.

3. To reveal sources of economy in production process.

4. To provide for an effective system of stores, materials etc.

5. To exercise effective control on factors of production.

6. To ascertain the profitability of each product.

7. To suggest management on future expansion policies.

8. To present and interpret data for management decisions.

9. To organise cost reduction programmes.

10. To facilitate planning and control of business activity.

11. To supply timely information for various decisions.

12. To organise the internal audit systems etc.

FINANCIAL ACCOUNTING Vs COST ACCOUNTING

	Financial Accounting	Cost Accounting

1.Distinction Period/Amount	Transactions are recorded for a definite period.	Transactions are identified with cost units.
2.Coverage of Transactions	It covers transactions of the whole firm pertaining to business-complete.	It covers only a part of the transaction viz., manufacturing, sales, services etc.-partial.
3.Purpose	It is prepared to show the final results during a particular period to owners, outside etc.	It aims to guide the management for proper planning, control and decision-making.
4. Analysis of Expenditure	It analyses the expenditure under different types of expenses, e.g., wages, salaries, depreciation etc.	It analyses the expenditure under different heads of performance as distinct from types of expenses, e.g., direct materials etc.
5. Efficiency	The overall result of the business can be revealed by profit and loss account, but result of each department cannot be known; as such corrective measures cannot be taken.	It analyses the profitability and unprofitability of each department. It reveals the unprofitable product of each department. So corrective measures can be taken.
6. Material control	It does not tell us the inefficiencies of material handling, as the figures are available in aggregate.	It provides a system of good inventory control through a prescribed procedure for purchases, storage, issue etc.
7. Independent entity	It is quite independent of cost accounting. It can work even in the absence of cost accounting system.	It depends upon financial accounting for the supply of basic data for analysis.

8. Reconciliation of results	It does not need any such reconciliation.	It needs reconciliation of its profit with that of financial records to find out correct profit.
9. Nature	It is a positive science.	It is a positive as well as normative science.
10.Wastages	There are no such categories.	Wastages, shortages, losses etc., are categorised into normal and abnormal losses.
11. Transactions	It deals with external transactions.	It deals with internal transaction.
12. Dealings	It deals with actual facts and figures.	It deals party with actual facts and figures and partly with estimates.
13. classifications	It makes no distinction between controllable and uncontrollable or fixed and variable costs.	It makes clear distinction between controllable and uncontrollable or fixed and variable cost. Thus, costs can be reduced to the minimum.
14. Stock	It is valued at cost price or market price whichever is less.	It is valued at cost.
15. Relative efficiency	It does not reveal the relative efficiencies of workers, plant, machineries etc.	It provides information for all operation and can compare with standard cost; and deviations can be analysed for corrective actions.
16. Legal requirements	They are kept as required by company Act, Income Tax Act.	These accounts are generally kept to meet the requirement of the management. Now, it is

		obligatory to keep such records.

Advantages of Cost Accounting

The deficiencies of financial accounting outlined earlier are the chief advantages of cost accounting. It is a very valuable tool of control. It offers a number of advantages to the management and the following are the main advantages:

TO THE MANAGEMENT

1. **Guide in reducing price:**

In certain periods it becomes necessary to reduce the price eve below the total cost. This will be so when there is a depression or slump. Costs, properly ascertained, will guide management in this direction.

2. **Measuring efficiency:**

Cost accounting will enable a concern to measure its efficiency and then maintain and improve it. This is done by comparisons and analysis of the differences that may be observed. For instance, material costs have been increased: the increase may be due to increase in price of materials or may be due to greater wastage or increase may be due to inefficiency at the time of buying or unnecessarily high price paid.

3. Action against unprofitable activities:

It reveals unprofitable activities, inefficiencies such as wastage of materials-spoilage, leakage, pilferage, scrap etc. and wastage of resources-inadequate utilisation etc. The management is able to concentrate on profitable jobs and consider change or closure of the unprofitable jobs.

4. Facilitates decision-making:

It provides necessary data along with information to the management to take decision on any matter, relating to the business.

5. Assists in fixing prices:

The various type of cost accounting are much helpful in fixing the cost and selling price of a product. Thus, the desired volume of production is secured at the minimum possible cost.

6. Improve efficiency:

Through the standard cost and budgetary control, remedial action can be chosen in order to improve the efficiency and implement new principles.

7. Facilitates cost control:

It facilitates cost control possible by comparisons, product-wise or firm-wise.

8. Establishes standard cost:

It enables the managers to find out the cost of each job and to know what it should have cost; it indicates where the losses and wastes occur before the work is finished. Standard cost is a pre-determined cost and offers a number of advantages to the management.

9. Inventory control:

An effective system and check are provided on all materials and stores. Interim profit and loss account, and balance sheet can be prepared without checking the physical inventory.

10. Prevents fraud:

An effective costing system prevents frauds and manipulation, and supplies reliable cost data to the management.

11. Tool of management control:

It provides systematic and comparative reports to the managements; and in turn corrective measures can be applied immediately. It aims to reduce waste, better selling, higher profits etc.

12. Measuring records:

It records the performance of different group of workers, plant, machinery etc. For measuring their comparative efficiency.

13. Future prospects:

The cost accountant not only provides the present trend, but future prospects also. On this basis, bankers, debenture holders, financial agencies etc., From an idea of the soundness of the firm before granting credits.

14. Budgeting:

As cost accounting reveals actual cost, estimated cost and standard cost of products, preparation of budget is easy. Effective budget control is also possible. Thus "Cost accounting is a system of foresight and not a post-mortem examination; it turns the losses into profits, speeds up activities and eliminates wastes".

15. Check on accuracy:

A good system of cost accounting affords an independent and most reliable check on the accuracy of financial accounts. The check operates through reconciliation of profit shown by cost account and financial accounts.

16. Essentials of a good costing system:

An ideal system of cost accounting must prosses some characteristics which bring all the advantages, discussed above, to the business, in order to be ideal and objective. The main characteristics are:

17. Simplicity:

It must be simple, flexible and adaptable to the changing conditions. And it must be easily understandable to the personnel. The information provided must be in the proper order, in right persons so as to be utilised fully.

18. Flexibility and adaptability:

The costing system must be flexible to accommodate the changing conditions and circumstances. The expansion, contraction or changes must be adopted in the existing system with minimum changes.

19.Economy:

The costing system must suit the finance available. The expenditure must be less than the existing system with minimum changes.

20. Comparability:

The management must be able to make comparison of the facts and figures with the past figures, figure of other concerns, or other departments of the same concern.

21. Suitability to the firms:

Before accepting a costing system, the nature, requirements, size, conditions of the business etc., must be carefully considered. The system must be capable of prompt and accurate reporting to different levels of management according to their requirements.

22. Minimum changes to the existing one:

When introducing a costing system, it may cause minimum disturbance to the existing set up of the business.

23.Uniformity of forms:

Forms of different colours can be used to distinguish them. Forms must be uniform in size and quality. Forms should contain instructions to fill, to use and for disposal.

24. Less clerical work:

Printed forms will involve less labour to fill in, as the workers may be a little educated. They may not like to spend much time in filling the forms.

25. Efficient material control and wage system:

There must be a proper procedure for recording the time spend on different jobs, by workers for the payment of wages. A systematic method of wage will help in the control of labour cost.

26. A sound plan:

There must be proper and sound plans to collect, to allocate and to apportion overhead expenses on each job or each to find out the cost accurately.

27.Reconciliations:

The systems of costing and financial accounting must be facilitated in the reconcile in the easiest manner.

28.Overall efficiency of cost accountant:

The work of the cost accountant under a good system of costing must be clearly defined as to his duties and responsibilities to the firm are very essential

Cost   Accounting

Specimen Cost Sheet

PARTICULARS	TOTAL COST	COST PER UNIT
Direct Materials	XXX	XXX
Direct Labour	XXX	XXX
Direct Expenses	XXX	XXX
PRIME COST	XXX	XXX
Add: Factory overheads	XXX	XXX
FACTORY OR WORK COST	XXX	XXX
Add: Administration overheads	XXX	XXX
COST OF PRODUCTION	XXX	XXX
Add: Selling and distribution overheads	XXX	XXX
TOTAL COST &COST OF SALES	XXX	XXX
Add: Profit	XXX	XXX
SALES	XXX	XXX

SPECIMEN COST SHEET

Particulars	Rs	Total cost Rs
Opening stock of raw materials	XXX	
Add: Purchase of raw materials	XXX	
Carriage on purchase	XXX	

	XXX	
Less: closing stock of raw materials	XXX	

Direct materials consumed		XXX
Direct labour		XXX
Direct Expenses		XXX
PRIME COST		
Add: Factory or work cost/Factory overheads	XXX	
Add: opening stock of work progress	XXX	

Less: Closing stock of work in progress	XXX	
Sales of factory scrap	XXX	
	XXX	XXX
FACTORY COST/W.COST		XXX
Add: Administration overheads		XXX
COST OF PRODUTION		XXX
Add: opening stock finished good	XXX	
Less: closing stock finished good	XXX	
		XXX

COST OF GOODS SOLD		XXX
Add: Selling and distribution overheads		XXX
COST OF SALES OR TOTAL COST		XXX
Add: Profit		XXX
SALES		XXX

Cost sheet and production Account

Cost sheet is a statement. It is not an account. It does not form the part of double entry system. It discloses the total cost and the cost and the cost per unit during the given period. When entering the information of costs, sales and profit or loss in the form of a ledger account, it is known as production account or manufacturing account. This account is debited with opening stock and all items of costs and credited with sales and closing stock; the balancing figure shows either profit or loss.

COST SHEET

ILLUSTRATION: 1

Prepare a cost sheet:

Raw material consumed   Rs:80,000

Wages   Rs:20,000

Factory expenses is charged at   100%of wages,

Office overheads charged at   20%on factory cost.

Solution:

PARTICULARS	TOTAL COST RS.
Raw material consumed	80,000
Wages	20,000

Prime cost	1,00,000
Add: Factory Expenses (20,000x100%)	20,000
Factory Cost	1,20,000
Add: Office overheads (1,20,000x20%)	24,000
Cost of Production	1,44,000

ILLUSTRATION: 2

Prepare a cost sheet from the following data:

Raw material used   Rs. 60,000

Wages   Rs. 15,000

Works expenses is charged at 100% of prime cost office overhead is charged at 25% on works cost selling overhead is 10% of cost of production

SOLUTION:

COST SHEET

Particulars	Total Cost (RS.)
Raw material used	60,000
Wages	15,000
Prime cost	75,000
Add: Works Expenses (100% of prime cost)	75,000
Works cost	1,50,000
Add: Office Overhead (1,50,000x25/100)	37,500

Cost of Production	1,87,500
Add: Selling Overhead	18,750
(1,87,500x10/100)	
Sales	2,06,250

ILLUSTRATION: 3

Prepare a cost sheet from the following data:

Raw material used   Rs.60000

Wages   Rs.15000

Work expenses is charged at 100% of prime cost office overhead is charge at 25% on works cost selling overhead is 10% of cost of production.

Solution:

Cost sheet

Particulars	Total cost (Rs.)
Raw material used	60,000
Wages	15,000
Prime cost	75,000
Add: works expenses (100% of prime cost)	75000
Works cost	1,50,000
Add: office overhead (150000x25/100)	37500
Cost of production	1,87,500
Add: selling overhead(187500x10/100)	18,750
Sales	2,06,250

ILLUSTRATION:4

Calculate prime cost, factory cost, cost of production, cost of sales and profit from the following details:

Direct materials   Rs.10000

Direct labour   Rs .4000

Direct expenses   Rs.   500

Factory expenses   Rs. 1500

Administrative expenses   Rs.10000

Selling expenses   Rs.   300

Sales   Rs.20000

Solution :

COST SHEET

Particulars	Total cost (RS.)
Direct Materials	10,000
Direct Labour	4,000
Direct Expenses	500
Prime Cost	14,500
Add: Factory Expenses	1,500
Works Cost	16,000
Add: Administrative Expenses	10,000
Cost Of Production	17,000
Add: Selling Expenses	300

Total Cost	17,300
Add: Profit	2,700
Sales	20,000

ILLUSTRATION: 5

From the following particulars, prepare cost sheet showing the comparative cost per tonne for the periods:

	Three months ended	
	31st march	30th June
	Rs.	Rs.
Productive wages	72,000	98,000
Administrative expenses	12,000	12,000
Raw materials	36,000	49,000
Taxes and insurance(**factory**)	750	750
Light and water	1,000	1,000
Direct expenses	9,000	12,000
Depreciation	2,000	2,000
Factory rent	1,500	1,500
Unproductive labour	30,000	41,000
Factory repairs	3,000	4,500
	1,67,250	2,22,250

The tonnage produced in the two quarters was 12,000 and 16,000 respectively.

Solution:

Cost Sheet

Three months ended 31st march 12,000 tonnes		Particulars	Three months ended 30th June 16,000 tonnes	
Total (Rs)	Cost per tonnes (Rs.)		Total (Rs.)	Cost per tonnes (Rs.)
36,000	3.00	Raw materials	49,000	3.06
72,000	6.00	Productive wages	98,000	6.13
9,000	0.75	Direct expenses	12,500	0.78
1,17,000	9.75	**PRIME COST**	1,59,500	9.97
		Work overheads:		
30,000	2.50	Unproductive labour	41,000	2.56
1,500	0.13	Factory rent	1,500	0.09
3,000	0.25	Factory repairs	4,500	0.28
1,000	0.08	Light and water	1,000	0.06
2,000	0.17	Depreciation	2,000	0.13
750	0.06	Taxes and insurance	750	0.05
1,55,250	12.94	WORKS COST	2,10,250	13.14
12,000	1.00	Administrative expenses	12,000	0.75
1,67,250	13.94	TOTAL COST OF PRODUCTION	2,22,250	13.94

ILLUSTRATION: 6

ABC is manufacturing refrigerators and the following details are furnished in respect of factory operations for the year ended 31st December.

Work-in-progress(beginning)	Rs	R s.
At prime cost	51,000	
manufacturing expenses	15,000	66,000

work-in-progress(end):

at prime cost	45,000	
manufacturing expenses	9,000	54,000
stock of raw materials in the beginning		2,22,000
purchase of raw materials		4,77,000
direct labour		1,71,000
manufacturing expenses		84,000
closing stock of raw materials		2,04,000

On the basis of the above data, prepare a statement showing the cost of production. Also indicate separately the amount of manufacturing expenses which enter into the cost of production.

Solution:

	Rs	Rs
Raw Materials:		
Opening Stock	2,25,000	
Add: Purchases	4,77,000	
	7,02,000	
Less: Closing Stock	2,04,000	
Raw Materials Consumed		4,98,000
Direct Labour		1,71,000
Add: Work-In-Progress in the Beginning		
Add: Work-In-Progress in the End		6,69,000
PRIME COST		51,000
		7,20,000
Manufacturing Expenses:		45,000

		6,75,000
Relating To Opening Work-In-Progress	15,000	
Add: Relating to Current Year	84,000	
	99,000	
Less: Relating to Closing	9,000	
		90,000
Work-In-Progress		7,65,000
COST OF PRODUCTION		

ILLUSTRATION: 7

The Directors of a manufacturing business require a statement showing the production results of the business for the month of March. The accounts reveal the following information:

Stock on hand 1st march:	Rs.
Raw Materials	25,000
Finished Goods	17,360
Stock on hand 31st march:	
Raw Materials	26,250
Finished Goods	15,750
Purchase of Raw Materials	21,900
Work-in-progress 1st march	8,220
Work-in-progress 31st march	9,100
Sales of finished goods	72,310
Direct wages	17,000

	Rs.	Rs.
Non-productive wages	830	
Works Expenses	8,340	
Office and Administrative expenses	3,160	
Selling and distributing Expenses	4,210	

You are required to construct a statement so as to show:

(a) The value of materials consumed,

(b) The total cost of production,

(c) The cost of goods sold,

(d) The net profit for the month.

Solution:

Statement of cost for the month of march

	Rs.	Rs.
Opening stock of raw materials	25,000	
Add: purchases	21,900	
	46,900	
Less: Closing Stock of Raw Materials	26,250	
(a) MATERIALS CONSUMED:		20,650
Direct Wages		17,150
PRIME COST		37,800
Non-productive wages	830	
Works expenses	8,340	
		9,170
Add: Work –in-progress (1st march)		46,970
		8,220

Less: Work-in-progress (31st march)		55,190
		9,100
		46,090
		3,160
WORKS COST		49,250
Office and administrative Expenses		17,360
a) TOTAL COST OF PRODUCTION		66,610
Add: Stock of finished stock (1st march)		15,750
Less: Stock of finished stock (1st march)		
(b) COST OF GOODS SOLD		50,860
Selling and Distributive Expenses		4,210
COST OF SALES		55,070
(a) Profit (Balancing figure)		17,240
SALES		72,310

ILLUSTRATION: 8

From the following particulars, prepare a statement showing the components of the total sales and the profit for the year ended 31st December.

	Rs
Stock of finished goods (1st Jan).	6,000
Stock of Raw Materials (1st Jan)	40,000
Work-in-progress (1st Jan)	15,000
Purchase of Raw Materials	4,75,000
Carriage inwards	12,000

	Rs	
Factory rent, taxes	7,250	
Other production expenses	43,000	
Stock of goods (31st Dec)	15,000	
Wages.	1,75,000	
Works managers salary	30,000	
Factory employee's salary	60,000	
Power expenses	9,500	
General expenses	32,500	
Sales for the year	8,60,000	
Stock of Raw materials	50,000	
Work-in-progress (31st Dec)	10,000	

SOLUTION:

COST SHEET FOR THE YEAR ENDING 31ST DEC.

	Rs	Rs
Stock of Raw Materials on 1st Jan.	40,000	
Add: Purchase during the year	4,75,000	
	5,15,000	
Less: stock of material on 31st Dec	50,000	
Cost of materials consumed		4,65,000
Wages		1,75,000
Carriage inwards		12,500
PRIME COST		**6,52,000**
Add: factory on cost		
Work managers salary	30,000	

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Factory employee's salary	60,000	
Factory rent, taxes and insurance	7,250	
Power expenses	9,500	
Other production expenses	43,000	
	1,49,750	
Add: Work-in-progress	15,000	
	1,64,750	
Less: work-in-progress	10,000	
		1,54,750
FACTORY COST		**8,07,250**
Add: office on cost		

General expenses		32,500
TOTAL COST		**8,39,750**
Add: stock of finished goods		6000
		8,45,750
Less: stock of finished goods		15,000
COST OF SALES		**8,30,750**
PROFIT		**29,250**
TOTAL SALES		**8,60,000**

ILLUSTRATION: 9

The following data relate to the manufacture of a product during the month of January

Raw materials consumed Rs. 80,000

Direct Wages Rs. 48,000

Machinery hours worked 8,000

Machine hour rate Rs. 4

Office overhead 10% of works cost

Selling overhead Rs. 1.50 per unit

Units produced 4,000

Units sold 3,600 at Rs. 50 each

Prepare a cost sheet and show (a) cost per unit and (b) profit for the period.

SOLUTION:

COST SHEET FOR JANUARY (Output: 4,000 units)

	Total Cost Rs.	Cost per unit Rs.
Raw materials	80,000	20.00
Direct Wages	48,000	12.00
Prime cost	1,28,000	32.00
Factory overhead (8,000×Rs. 4)	32,000	8.00
Work cost	1,60,000	40.00
Office overhead (10% of works cost)	16,000	4.00
Cost of production	1,76,000	44.00
STATMENT OF PROFIT (3,600 units sold)		
	Rs.	Rs.
Cost of production	1,58,000	44.00
Selling overhead	5,400	1.50
Cost of goods sold	1,63,800	45.00
Profit	**16,200**	**4.50**
Sales	**1,80,000**	**50.00**

(a) Cost per unit = Rs. 44 (b) Total profit= Rs. 16,200

NB: A Cost Sheet discloses the total cost and the cost per unit during the given period.

ILLUSTRATION: 10

Draw a statement of cost from the following particulars

Opening stock.	(1) Materials.	2,00,000
	(2) Work-in-progress.	60,000
	(3) Finished goods.	5,000
Closing stock.	(1) Materials.	1,80,000
	(2) Work-in-progress.	50,000
	(3) Finished goods.	15,000
Materials Purchased.		5,00,000
Direct Wages.		1,50,000
Manufacturing expenses.		1,00,000
Sales.		8,00,000
Selling and distribution expenses		20,000

SOLUTION:

STATEMENT OF COST

	Rs.	Rs
Opening stock of material.	2,00,000	5,20,000
Add: Purchases of material.	5,00,000	

	7,00,000	
Less: Closing stock of material.	1,80,000	
Materials consumed:		5,20,000
Direct Wages		1,50,000
Manufacturing expenses.		6,70,000
Add: Opening stock of Work-in-progress.		7,70,000
		60,000
Less: Closing stock of Work-in-progress.		8,30,000
		50,000
COST OF PRODUCTION (Work cost).		7,80,000

STATEMENT OF PROFIT

	Rs.
Goods manufactured.	7,80,000
Add: Opening stock of finished goods.	5,000

		7,85,000
Less: Closing stock of finished goods.		15,000
		7,70,000
Add: Selling and distribution expenses.		20,000
TOTAL COST		7,90,000
NET PROFIT		**10,000**
SALES		8,00,000

UNIT-II

MATERIAL COSTING

CLASSIFICATION OF MATERIALS - MATERIAL CONTROL - PURCHASING PROCEDURE-STORE KEEPING - TECHNIQUES OF INVENTORY CONTROL - SETTING OF STOCK LEVELS- EOQ METHOD OF PRICING - MATERIALS ISSUES - LIFO-FIFO - WEIGHTED AVERAGE METHOD - SIMPLE AVERAGE METHOD.

DEFINITION

Material cost is the monetary value of consumed raw materials in production process. Material costing is the process of determining the costs at which inventory items are recorded into stock, as well as their subsequent valuation in the accounting records.

INTRODUCTION

We have acquired a basic knowledge about the concepts, objectives, advantages, methods and elements of cost. We shall now study each element of cost separately beginning with material cost. The general meaning of material is **all commodities/ physical objects used to make the final product.** It may be direct or indirect.

    i.   Direct Materials:

        Materials, cost of which can be directly attributable to the end product for which it is being used, in an economically feasible way.

    ii.   Indirect Materials:

        The materials which are not directly attributable to a particular final product.

Classification of materials:

Materials are classified according to nature such as raw material, consumable stores, spares and the like. In terms of relationship, materials are classified as direct material and indirect material. On the basis of source of supply, materials are classified as indigenous materials/imported materials.

      ➤ Raw Materials-the basic material supplied in crude form to be used for production.

- Components-finished parts made out of raw material which are assembled to make finished products.
- Tools-appliances used in manufacturing operations.
- Spare parts-used for maintenance of plant, machinery etc.

MATERIAL CONTROL

MEANING

The basis objectives of cost accounting are cost control. This objective is attained by an effective control on each element of cost. Out of the three element-material, labour and expenses the material element is the biggest or the highest proportion of the total cost of production. The material means and includes raw materials, spare parts, components, factory supplies, packing materials etc. The term material control means the regulation of an organization relating to procurement, storage and usage of materials in such a way as to maintain an even flow of production without excessive investment in material stock. It is also defined "providing the right quantity of material of the right quality at the right time and place at the minimum cost". The quality of finished goods is also governed by the **quantity of raw materials, which are used in the production. Hence material control is an important function of the management.**

DEFINITOIN

Material control can be defined as "a systematic control over purchasing storing and consumption of material so as to material regular and timely supply of material at the same avoiding over stocking".

OBJECTIVES OF MATERIAL CONTROL

- To make available all type of material and stores of right quality.
- To make purchases of material of required and stores of right product.
- To make purchase of material at reasonable low cost or at maximum economy.
- Investment in material should not tie up huge amount of capital which may be used better.
- To avoid abnormal wastage leakage of the material store keepers must
- To avoid obsolescence of material by adopting better method of issue.
- To ensure proper storage and utilisation of materials.

ESSENTIAL OF MATERIAL CONTROL

1.There should be coordination among the department dealing with material purchasing receiving storage production planning of materials.

2.Purchasing of material should be centralized under expert personnel who have been trained.

3.All items in the store should be codified classified and standardized.

4.Proper form should be used for dealing of store items issue transfer return of material etc.

5.Material storage should carefully plan to avoid losses from theft deterioration damage evaporation pilferage etc.

6.Store control measures be like ABC analysis and stock verification should be introduced.

7.Stock at different levels should be fixed to reduce ordering stocking material.

8.Purchasing quantity should be fixed to reduce the ordering costs and carrying cost.

9.Material and supplies should be properly stored.

ADVANTAGE OF MATERIAL CONTROL:

- Elimination of waste in the use of material
- Reduction of risk of loss on account of theft loss fraud etc.
- Availability of the right quality of material in time.
- Avoidance of overstocking.
- Possibility of economic buying.
- Reviewing and revising of product design and saving in material
- Prevention of production of production delays.

SCOPE OF MATERIAL CONTROL:

The following functions are within the scope of a material control system:

1.Purchasing or procurement of materials.

2.Receiving of materials.

3.Inspection of materials.

4.Storage of materials.

5.Issuing of materials.

6.Maintenance of material records.

7.Materials or stock audit.

PROCEDURES FOR PURCHASING MATERIALS

After selecting a supplier, a formal purchase order is sent for the supply of goods. A Purchase order is sent on a printed form and is duly authorized by the purchase manager. This order should contain details about the quantity, price, mode of delivery, terms of payment etc.

Material inventory purchase procedure is a step-by-step guideline on how to manage raw materials for an organization especially of manufacturing or processing nature. It one of the key managerial activities an organization adheres to so as to avoid wastage of resources. The steps are characterized by seven key stages to be followed when dealing with purchase of material inventory. They are as detailed here under.

Following purchasing procedure is generally followed:

1.Determining Purchase Budget:

Purchase manager prepares a purchase budget for the forthcoming financial year. Purchase budget is prepared with the help of production planning department. It contains detailed information regarding quantity to be purchased, quality of materials, time of purchase and the source of procurement. A schedule of materials and components needed for various jobs, known as bill of materials, is also prescribed for working out details of purchase budget. A bill of materials is also useful in exercising control over the utilization of materials.

2.Receipt of purchase Requisition:

The purchase officer initiates action for the purchase of materials only when he receives a request for the same. The store-keeper and departmental heads send requisition slips to purchase department giving details of materials required by their departments etc. A purchase requisition is a form used as a formal request to the purchasing department to purchase materials. The form is prepared by the store keeper for regular stock materials and by the departmental head for specific materials not stocked as regular items. The storekeeper knows when an action or fresh procurements is to be initiated. It is on the basis of purchase requisition that orders are placed for materials.

3.Determining Sources of supply:

Purchase manager remains in touch with various suppliers of materials. The quotations are invited for the purchase of specific items. After receiving quotations, a comparative study is made regarding terms and conditions offered. The factors to be considered include price, quantity, quality, time of delivery, terms of payment, trade discount and reputation of suppliers. After looking at various factors a final decision is taken about the supplier of goods.

4.Placing Order:

After selecting a supplier, a formal purchase order is sent for the supply of goods. A purchase order is sent on a printed form and is duly authorized by the purchase manager. This order should contain details about the quantity, quality, price, mode of delivery, terms of payment etc. The purchase order authorizes the vendor to despatch goods specified in it. It establishes a contractual relation between the buyer and the vendor.

5.Follow-Up of Purchase Order:

A purchase order normally bears a date by which the goods must be delivered. It is in the interest of the organization that goods are received in time for keeping uninterrupted flow of materials. The suppliers may be reminded of the date of delivery of goods. A follow-up of purchase order is necessary to receive stocks in time.

6.Receipt and Inspection of Materials

In big concerns the task of receiving materials is assigned to the purchase department where as in small concerns this work is done by the store keeper. After unpacking goods their quantity is compared to that given in delivery challans. Any discrepancy in items is reported to the purchase department. The specifications and quality of goods is also checked at this stage.

7.Checking Invoices

Lastly, purchase department checks the invoices supplied by the vendor with that of its own records. The quantity, quality, price, terms etc. Are compared with those given in purchase order. After making full checking the invoices are sent to accounts department for payment.

STORE-KEEPING

When the materials have been received by the goods clerk according to the purchase order, it is passed on to the store, along with the goods inspection report. A store-keeper must be a man of integrity, honesty and punctuality. The store–keeper, who is comparable to the cashier of a bank or an organisation, takes initiative in locating the differences in stock if any.

Objectives of store keeping:

An efficient system of store keeping has the following objectives.

1. To ensure uninterrupted supply of materials and stores without delay to various production and service departments of the organization.
2. To prevent over stocking and under stocking of materials.
3. To check all materials in term of quality and quantity.
4. To minimize storage costs.
5. To ensure effective and continuous control over materials.
6. To ensure optimal utilization of available storage space and workers engaged in store keeping process.
7. To protect materials from loss and wastage due to defective storage.
8. To identify and locate materials in storerooms without delay.
9. To protect and safeguard material items from pilferage, theft, fire and others.
10. To develop a system that provides complete and up to date information about all stored items.

Functions of the store-keeper

The cost of raw material is the largest element of cost. Therefore, it is imperative that utmost important should be given to storekeeping. The main function the store- keeper are given below:

(1) He must receive the materials, store them properly according to the goods inspection report or the invoice
(2) Material is classified according to the nature, size, shape, price etc. He must place them in definite places (racks or bins) and number them for easy identification.
(3) He must initiate the purchase requisition, when the materials reach ordering level.
(4) He should not allow unauthorised person to enter into the store- room.
(5) He must maintain the stock registers, entering therein all receipts, issues and balances.

(6) He should make issue of materials only upon written materials requisition, duly signed by an authorised person.

(7) He must arrange for physical verification of store items, periodically.

(8) He must keep the

STORE LAYOUT

To facilitate prompt receipt and issue of materials they must be arranged through a well-planned system, assigning a definite place for each and every item. If necessary, sub-stores may be created and heavy or bulky materials may be kept there only. Bin is a place –rack shelves, boxes etc.., where the materials have been kept. All bins are serially numbered proper attention must be paid to the storage of materials which are liable to be affected by evaporation or leakage.

TYPES OF STORES

The size, type and policy of the industry will decide the types of stores. Generally, there are three types of stores:(1) centralised stores (2) decentralised stores and (3)A combination of the two i.e., centralised stores with sub stores:

1.**CENTRALISED STORES**.

This is a system of store, where materials are received by and issued from, one –stores department.

The advantages are:

(a) Better supervision of stores is possible.

(b) Better layout of stores and control are possible.

(c) Less space is required, as stores are kept at minimum.

(d) Minimum investment in stores is facilitated.

(e) Better forecasting of requirement of materials is possible.

(f) Economy in staff and stationery, means, economy in cost.

(g) A highly specialised purchaser can be appointed for securing maximum advantage in purchasing.

(h) Timely flow of materials is facilitated.

(i) Constant and easy stock-taking is possible.

(j) Improved techniques can be adopted.

(k) Possible to observe a uniform code system and specification.

(l) Better safety and security of stock.

Disadvantages

(a) Cost of materials handling may increase.

(b) Delay is generally found.

(c) The risk of loss by fire is greater.

(d) Overcrowding of materials will affect storing and controlling.

(e) Breakdown of transport will adversely affect production.

(f) Specific needs of individual department tend to incur loss.

2.DECENTRALISED STORES.

This is a system where each department has its own stores. The purchasing and handling of materials are undertaken by the buyer of each department. In short, all the disadvantages of the centralised purchase are avoided, under this system.

3.CENTRAL STORES WITH SUBSTORES.

This system is also known as systems of stores control. In order to minimise the handling charges, a sub -store is formed near the production department. A fixed quantity of materials is issued by the central stores to the sub-stores, at the beginning of the period. At the end of the period, sub - store make requisition from the central stores to bring the stock to pre-determined level. It briefs it is similar to petty cash systems.

The chief advantages are:

- ✓ It minimises the demerits of centralised store.
- ✓ It offers services to meet the special needs of individual department.

✓ It relieves the central stores of the burden of sundry issues

✓ Many sub -stores allow room for improved store management.

✓ It facilitates easier location of discrepancies in stores.

✓ It avoids delay in issuing materials.

TECHNIQUES OF INVENTORY CONTROL

INTRODUCTION

Inventory control involves various techniques for monitoring how stocks move in a warehouse. Four popular inventory control methods include ABC analysis; Last in, first out (LIFO) and first in, first out (FIFO); batch tracking; and safety stock.

DEFINITION

In **General** Sense, "Inventory control is a method where all stocks of goods are properly and promptly issued, accounted, and preserved in the best interest of an entity that handles its inventory".

In terms of **Business**, "Inventory control is a method designed by the top level of management of a company. It requires a strategic decision to be taken for its effective implementation. Its proper implementation is the responsibility of the store manager".

In the **Academic** perspective, "Inventory control is a method to identify those stock of goods, which can be used for the production of finished goods. It shall be supported by a schedule which gives details regarding; opening stock, receipt of raw-materials, issue of materials, closing stock, and scrap generated".

MEANING

"Inventory control" focuses on the **process** of movement and accountability of inventory. This consists of **strict policies and process** in regards to:

1. The physical and systemic movement of materials
2. Physical Inventory and cycle counting
3. Measurement of accuracy and tolerances
4. Good Accounting Practices

- The simple meaning of inventory in dictionary is "detailed list of all the goods in stock".

- In short, inventory can be defined as the "a stockpile of goods an organization is offering for sale and components that are used in the manufacturing process".

It includes:

    a) Finished goods

    b) Raw materials

    c) Supplies

- Organization such as **hospitals** provide the consumer with **finished goods** i.e., **medicines and drugs**. Inventory is purchased in salable form and used without any further processing.

- Inventory exists because supply and demand are difficult to synchronize perfectly.

- Different types of costs are associated with inventory like item cost, ordering cost, holding cost and stock-out cost.

NEED FOR INVENTORY CONTROL

- Inventories constitute the most significant part of the current assets, representing as much as 50%-70% of the capital investment. Therefore, it is absolutely imperative to manage inventories effectively and efficiently in order to avoid unnecessary investment in them.

- If a company's inventory level is too low, it delays in fulfilling its customers' orders.

- If the inventory level is too high, it is using up money that can be better used in other areas. It also risks obsolescence and spoilage.

Defining inventory control

- Inventory control is defined as the supervision of supply, storage and accessibility of items in order to ensure an adequate supply without excessive oversupply.

- The objective of inventory management is to have the appropriate amounts of materials inn the right place, at the right time, and at low cost.

SETTING OF STOCK LEVEL

As a planning function, the management decides well in advance what quantities of raw materials should be maintained, when re-order should be placed and what should be purchased. Decisions with regard to the quantity of materials to be stocked are reached after considering the following points:

1. Time lag (lead time)
2. Consumption rate
3. Investment in inventories
4. Store capacity
5. Nature of materials
6. Cost of storage
7. Market conditions
8. Changes in prices
9. Economic order quantity

The different stock levels:

i. Minimum stock level (Safety stock)
ii. Maximum stock level
iii. Recorder level
iv. Danger level
v. Recorder quantity

1.MINIMUM STOCK LEVEL (SAFETY STOCK)

It is the level below which stock of materials is never to fall. If the stock goes below this level, there is every possibility that the production may be held up for want of materials. Minimum stock is a safety stock or buffer stock.

Minimum Stock Level = Recording level – (Normal consumption × Normal Recorder period)

2.MAXIMUM STOCK LEVEL

It is the stock level above which stock should not be allowed to rise. This is the maximum quantity of stock of raw materials which can be had in the stock. If it goes above, it will be overstocking. The demerits are:

1) Capital is blocked.
2) More space is needed.
3) Deterioration of stock is possible.
4) There will be loss due to obsolescence.
5) There is the danger of depreciation in value.

The maximum level indicates the maximum quantity of an item of material that can be held in stock at any time. The stock in hand is regulated in such a manner that normally, it does not exceed this level.

The maximum level is fixed by considering the following:

i. Availability of capital.
ii. Space availability in stores.
iii. Rate of consumption.
iv. Recorder level.
v. Delivery time to obtain fresh stock.
vi. Changes of price.
vii. Cost of maintaining the stock.

Maximum Stock Level = (Recorder level + Recording Quantity) – (Minimum consumption × Minimum Delivery Period)

3.**RECORDER LEVEL (ORDERING LEVEL)**

It is the point at which the store-keeper should initiate purchase requisition for fresh supply. The level lies between the maximum level and the minimum level. The recording point is fixed slightly higher than the minimum stock in such a way that the difference between the minimum level and the recording level is sufficient to meet the demand for production up to the time of fresh supply. The level depends upon the lead time, rate of consumption and economic order quantity.

Ordering level = Minimum level + Consumption during the time required to get fresh delivery, (or) = Maximum consumption × Maximum Recording Period.

The following factors are to be taken into account:

1. The margin of safety
2. The consumption rates
3. The normal delivery time i.e., the time that would lapse between the date of placing the order and of the arrival of supplies.
4. Minimum Stock level

4. DANGER LEVEL (DANGER POINT)

This level is below the minimum quantity. It is a level at which normal issues of the materials are stopped, but issued under special instructions. When the materials reach below the minimum level, i.e., danger level, the store-keeper must make special arrangements to get fresh issues, so that the production may not be held up for want of materials.

Danger level = Average rate of consumption × Emergency supply time

5. ECONOMIC ORDER QUANTITY (EOQ) (RECORDING QUANTITY)

It is not a stock level. It is a quantity to be ordered when the stock reaches the minimum level. Recorder quantity is such that when it is added to the minimum stock, it should not exceed the maximum level. It is also known as standard order quantity, optimum quantity or economic lot size. This includes interest on investment, obsolescence, overstocking, losses, space costs etc.

Formula

$$\mathbf{E.O.Q} = \frac{\sqrt{2AB}}{CS}$$

E.O.Q.= Economic order quantity

A = Annual consumption

B = Buying cost per order

C = Cost per unit

S = Storage and carrying cost

ILLUSTRATION: 1

Calculate Economic Order Quantity from the following information:

     Annual usage   : 600units

     Cost of placing an order: Rs.12

     Price of material per unit: Rs.20

     Cost of storage   : 20%

Solution:

$$EOQ = \frac{\sqrt{2AB}}{CS}$$

     A=Annual consumption = 600 units

     B=Buying cost per order = Rs.12

     C=Cost per unit = Rs.20

     S=Inventory carrying cost = 20%

1) $\dfrac{\sqrt{2} \times 600 \times 12}{20 \times 20\%} = \dfrac{\sqrt{2} \times 600 \times 12}{4} = \mathbf{60\ units}$

  (or)

2) $\dfrac{\sqrt{2} \times 600 \times 12}{20 \times \frac{20}{100}} = \mathbf{60\ units}$

  (or)

3) $\dfrac{\sqrt{2} \times 600 \times 12 \times 100}{20 \times 20} = \mathbf{60\ units}$

METHOD OF PRICING

When materials are issued for any production work or any job, they have to be valued in the costing department. If materials are purchased for any particular job, the total cost of the materials can be charged to that job. But generally raw materials are purchased in anticipation and issued whenever they are needed for production, assuming that the rate of raw materials is the same. But this is not the case always. Prices of everything change on the prevailing condition of the market. The stock lying in the store consists of many purchases at different rates and when issued, they create problems as to the fixation of the price.

Therefore, the important methods of pricing of materials issued are:

(A) **Actual price method**

    1. First in first out (FIFO)

    2. Last in first out (LIFO)

    3. Specific price

    4. Base stock

    5. Highest in first out (HIFO)

(B) **Average price method**

    1. Simple average

    2. Weighted average

    3. Periodic simple average

    4. Periodic weighted average

(C) **Other method**

    1. Standard price method

    2. Market price method

    3. Inflated price method

MATERIAL ISSUE

MEANING

One of the main objectives of cost accounting is to ascertain the accurate cost. Material usage is a vital part of the business concerns engaged in manufacturing. The ascertainment of accurate cost

largely depends upon the correct valuation of materials and labor used in the particular product The valuation of materials is divided into two parts:(a) valuation of materials received and (b)valuation of material issued. The incoming materials should be valued at invoice price plus freight, carriage, cartage, insurance, taxes etc. Materials, are issued to different jobs from the stores These jobs are charged with the value of materials issued to them But, the stock of materials consists of different consignments received at different dates and prices, and therefore, it becomes necessary to decide about the price which is to be charged from a particular job when are issued to it.

ISSUE PROCEDURE

The store-keeper receives materials and other items, stores them carefully and finally issues them for the purpose of production. He is accountable for every item received and stored in the store, under his care. Materials, control includes the issue control, i. e., the storekeeper makes issue of materials only against proper authorization. The management lays down the procedure for the issue of materials. The storekeeper can be compared to that of a cashier. The cashier deals with cash and the store-keeper deals with stores item. Cash is converted into material. Therefore, material is equivalent to cash. The storekeeper must take as much care as a cashier in dealing with store items.

MATERIAL REQUISITION NOTE

Whenever materials are required from store to use the foreman, or the departmental head initiates a "Material Requisition Note" (Stores Requisition Note) (See proforma 1). It is a formal request to issue the materials stating description and quantity and the work order (for which the material is required). It is prepared in triplicate signed by the requisitioner and countersigned by the authorized person. One copy is meant for further reference and the other two copies are sent to the stores. The storekeeper, at the time of issue, posts the requisition in the bin cards, sends the first copy to the store accounting section and the other copy is kept by him for his own record.

PROFORMA 1

Material Requisition Slip

M. R. No…....   Date……

Job No……   Store L. F.….

Section……

Please issue the following materials, as detailed below:

S. No	Description	Code No	Quantity		Price		Remarks
			Required	Issued	Rate Rs	Total Rs	

Bin No.   Requisition by   Issued by

                                          Authorized by   Received by

                                                         Costed by

TREATMENT OF SURPLUS MATERIAL ISSUED

Sometimes it happens that the materials issued are in excess of the quantity required. The cost of the excess materials cannot be charged to the job, which has already been charged with the cost at the time of issue made by the storekeeper. Now to dispose of the excess, there are only two ways – Return the excess materials to the store or transfer the excess material to some other department. Therefore, the following procedure may be adopted.

RETURN OF SURPLUS

When returning the excess material to the store, A "Material Return Note" or "Store Debit Note" is prepared. It is a printed from, specifying the details of the materials. (Proforma no 2) It is prepared in duplicate, and both the copies are to be signed by the storekeeper on receipt of materials. One copy is returned to the concerned section and the other copy is sent to the cost office.

PROFORMA 2

Material Return Note

Credit to (…. Section)   No……...

Charged to Job No……   Date…….

Order No……

S. No	Description	Code	S. L. Folio	For office use only		Remarks
				Rate Rs.	Amount Rs.	

Bin No.   Approved by   Priced by

Returned by

Received by

First in First Out (FIFO) Method

Under this system, materials are issued in the order in which they are received in the store. The material received first will be issued first. "First come first served". In other words, old stocks are issued first and new stocks will be issued afterwards. As a result of this system, when we value the closing stock of material, that will be at the latest price.

Advantages

1.The method is simple and easy to operate.

2.Closing value of materials will reflect at current market price.

3.This system is good for slow moving materials.

4.When prices are falling, this method gives better result.

5."First come, first served" is a logical system.

6.Deterioration and obsolescence can be avoided.

Disadvantages

1.When prices fluctuate, calculation becomes complicated.

2.Complicated calculation will invite clerical errors.

3.Under fluctuating prices, materials charged to different but similar jobs vary, leading to non-comparison.

4.When prices fall, jobs are charged with higher price of earlier materials; the quotations are less competitive.

5.When materials are returned to the store, they are treated as new purchases, for the purpose of next issue.

FIFO WITHOUT ADJUSTMENT

ILLUSTRATION:2

The stock in hand of a material as on 1st September was 500 units at Rs.10 per unit. The following purchases and issues were subsequently made. Prepare the Stores Ledger Account showing how the value of the issues would be recorded under FIFO method.

Purchases

6th Sept. 100 units at Rs.11

20th Sept. 700 units at Rs.12

27th Sept. 400 units at Rs. 13

13th Oct. 1000 units at Rs. 14

20th Oct. 500 units at Rs.15

17th Nov. 400 units at Rs. 16

Issues

9th Sept. 500 units

22nd Sept. 500 units

30th Sept. 500 units

15th Oct. 500 units

22nd Oct. 500 units

11th Nov. 500 units

Solution

STORES LEDGER (FIFO)

Name of Article……   Folio…...

Code…….   Maximum Level…...

Bin Card No…...   Minimum Level…...

Units…...   Recording Level…….

Date	Particulars	Receipts			Issues			Balance		
		Qty	Rate Rs.	Amt Rs.	Qty	Rate Rs.	Amt Rs.	Qty	Rate Rs.	Amt Rs.
Sept 1	Balance b/d	-	-	-	-	-	-	500	10	5,000
Sept 6	Goods Received Note No.	100	11	1,100	-	-	-	500	10	
								100	11	6,100
Sept 9	Requisition Slip No.	-	-	-	500	10	5,000	100	11	1,100
Sept 20	Goods Received Note No.	700	12	8,400	-	-	-	100	11	
								700	12	9,500
Sept 22	Requisition Slip No.	-	-	-	100	11				
					400	12	5,900	300	12	3,600
Sept 27	Goods Received Note No.	400	13	5,200				300	12	
								400	13	8,800
Sept 30	Requisition Slip No.	-	-	-	300	12				
					12	13	6,200	200	13	2,600
Oct 13	Goods Received Note No.	1000	14	14,000				200	13	
								1,000	14	16,600
Oct 15	Requisition Slip No.				200	13				
					300	14	6,800	700	14	9,800

Date	Particulars	Qty	Rate	Amount	Qty	Rate	Amount	Qty	Rate	Amount
Oct 20	Goods Received Note No.	500	15	7,500	-	-	-	700	14	
								500	15	17,300
Oct 22	Requisition Slip No.	-	-	-	500	14	7,000	200	14	
								500	15	10,300
Nov 11	Requisition Slip No.	-	-	-	200	14		200	15	3,000
					300	15	7,300			
Nov 17	Goods Received Note No.	400	16	6,400	-	-	-	200	15	
								400	16	9,400

Recording Quantity…….

Value of stock in hand Rs. 9,400 or $200 \times Rs.\ 15 + 400 \times Rs.\ 16 = Rs.\ 9,400$.

LAST IN FIRST OUT (LIFO) METHOD

This method is to opposite to FIFO. Here, materials received last are issues first. Issues are made from the latest purchases. The issues are priced at the unit cost of the latest lot or the most recent purchase. The issues are not in chronological order, and cost of the material reflects current market price.

Congress first approved the use of LIFO in the 1938 and 1939 Revenue Acts (Davis 1982; Pincus 1989).

Definition

The last in, first out, or LIFO (pronounced LIE-foe), accounting method assumes that sellable assets, such as inventory, raw materials, or components, acquired most recently were sold first. The last to be bought is assumed to be the first to be sold using this accounting method.

Formula of LIFO

To calculate FIFO (First-in, First Out) determine the cost of your oldest inventory and multiply that cost by the amount of inventory sold, whereas to calculate LIFO (Last-in, Fist-Out) determine the cost of your most recent inventory and multiply it by the amount of inventory sold.

Advantages

1.Material cost represents current price.

2.It facilitates complete recovery of material cost.

3.It is most suitable when prices are rising.

4.There is better matching of cost and revenue.

Disadvantages

1.It involves considerable clerical work.

2.Due to variation of prices, comparison of cost of similar jobs in non-comparable.

3.Stock of materials shown in balance sheet will not reflect market prices.

4.This system is not accepted by Income Tax authorities.

ILLUSTRATION: 3

From the following particulars write up the priced Stores Ledger under Last-in-first-out:

Dec.1   Stock in hand 500 units at Rs.20.

3   Issued 200 units.

3   Purchased 150 units at Rs.22.

4   Issued 100 units.

5   Purchased 200 units at Rs.25.

6   Issued 300 units.

6   Returned to Store 10 units (Issued on 4th Dec.)

7   Issued 100 units.

8   Issued 50 units.

On 10th, it was noticed that there is a shortage of 10 units.

Solution:

STORES LEDGER ACCOUNT (LIFO)

Name of Article……   Folio……

Code……   Maximum Level……

Bin Card No……   Minimum Level……

Units…….   Recording Level…….

                                                Recording Quantity…...

Date	Particulars	Receipts			Issues			Balance		
		Qty	Rate Rs.	Amt Rs.	Qty	Rate Rs.	Amt Rs.	Qty	Rate Rs.	Amt Rs.
Dec 1	Balance b/d	-	-	-	-	-	-	500	20	10,000
Dec 3	Requisition Slip No.	-	-	-	200	20	4,000	300	20	6,000
Dec 3	Goods Received Note No.	150	22	3,300	-	-	-	300	20	
								150	22	9,300
Dec 4	Requisition Slip No.	-	-	-	100	22	2,200	300	20	
								50	22	7,100
Dec 5	Goods Received Note No.	200	25	5,000	-	-	-	300	20	
								50	22	
								200	25	12,100
Dec 6	Requisition Slip No.	-	-	-	200	25				
					50	22				
					50	20	7,100	250	20	5,000
Dec 6	Returned	10	22	220				250	20	
								10	22	5,220
Dec 7	Requisition Slip No.	-	-	-	10	22				
					90	20	2,020	160	20	3,200
Dec 8	Requisition Slip No.				50	20	1,000	110	20	2,200

| Dec 10 | Shortage | - | - | - | 10 | 20 | 200 | 100 | 20 | 2,000 |

Value of stock: 100 units @ Rs. 20 = Rs. 2,000.

Weighted Average Method

This method gives weightage, apart from the price, to the quantity also. Weighted average price is a price obtained by dividing the total cost of materials in the stock by the total quantity of material in the stock; and issues are priced accordingly.

$$\text{Weighted Average price} = \frac{\text{Value of material in stock}}{\text{Quantity in stock}}$$

E. g.   100units purchased @ Rs.5

200 units purchased @ Rs.6

300 units purchased @ Rs.7

The weighted average price is Rs. 6.33 which is calculated as follows:

$$\frac{100 \text{ units} \times Rs.5 + 200 \text{ units} \times Rs.6 + 300 \text{ units} \times Rs.7}{100+200+300} = \frac{3,800}{600}$$

$$= Rs. 6.33$$

This method can safely be followed and is possible to recover the cost of materials purchased.

Advantages

1. It will smooth out fluctuations
2. It facilitates recovery of the cost paid for material
3. It is accepted by all.

Disadvantages

1.When many purchases are made at different rates, the calculation is tedious.

ILLUSTRATION: 4

The following particulars have been extracted in respect of material X. Prepare ledger account showing the receipts and issues, pricing the materials issued based on Weighted Average Method.

Receipts

3rd Oct. Purchased 500 units at Rs. 4.00 per unit.

13th Oct. Purchased 900 units at Rs. 4.30 per unit.

23rd Oct. Purchased 600 units at Rs. 3.80 per unit.

Issues

5th Oct. issued 400 units.

15th Oct. issued 400 units.

25th Oct. issued 600 units.

Solution

STORES LEDGER ACCOUNT (Weighted Average Method)

Name of Article……   Folio…...

Code…….   Maximum Level…...

Bin Card No…...   Minimum Level…...

Units…...   Recording Level…….

Recording Quantity…...

Date	Particulars	Receipts			Issues			Balance		
		Qty	Rate Rs.	Amt Rs.	Qty	Rate Rs.	Amt Rs.	Qty	Rate Rs.	Amt Rs.
Oct 3	Goods Received Note No.	500	4.00	2,000	-	-	-	500	4.00	2,000
Oct 5	Requisition slip No.	-	-	-	400	4.00	1,600	100	4.00	400

Oct 13	Goods Received Note No.	900	4.30	3,870	-	-	-	1,000	4.27	4,270
Oct 15	Requisition slip No.	-	-	-	600	4.27	2,562	400	4.27	1,708
Oct 23	Goods Received Note No.	600	3.80	2,280	-	-	-	1,000	3.988	3,988
Oct 25	Requisition slip No.	-	-	-	600	3.988	2,393	400	3.9875	1,595

Value of stock: 400 units @ Rs. 3.9875 = **Rs. 1,595**

SIMPLE AVERAGE METHOD

The Simple Average Price is calculated dividing the total of all rates of material in hand by the number of rates. The lot, which is exhausted, based on FIFO method is excluded in computing the average. This method is useful when the materials are received in uniform quantities and purchase prices are normally stable.

Issue prices of raw materials are fixed at the calculated average unit price. when new purchases are made at different rates, the average changes. This method of simple average is not generally followed, because it fails to recover the cost price of materials. For example

$$\text{Issue price} = \frac{\text{Total of unit prices of materials in stock}}{\text{Number of prices}}$$

100-unit purchases @ Rs. 5

200-unit purchases @ Rs. 6

300-unit purchases @ Rs. 7 $\quad$ Average Price $= \dfrac{5+6+7}{3}$

$$= \text{Rs. } 6$$

When issues are made at the rate of Rs. 6, recovery from production is equal to Rs. 3,600 (600×Rs. 6): but the actual cost paid is Rs. 3,800 (100×5+200×6+300×7). Therefore, there is an under recovery. Hence, this system is not followed. this defect is removed under the weighted average system.

Advantages

    1.It is easy to operate.

    2.It reduces clerical work.

    3.When there are slight fluctuations in price, it gives good result.

Disadvantages

    1.Costs are not fully recovered.

    2.This system is not generally followed.

ILLUSTRATION: 5

The following particulars have been extracted in respect of material X. prepare ledger account showing the receipts and issues, pricing the materials issued on the basic of Simple Average Method.

Receipts

    3rd Oct. Purchased 500 unit at Rs.4.00 per unit.

    13th Oct. Purchased 900 unit at Rs.4.30 per unit.

    23rd Oct. Purchased 600 unit at Rs.3.80 per unit.

Issues

    5th Oct. issued 400 unit.

    15th Oct. issued 400 unit.

    25th Oct. issued 600 unit.

Solution

STORES LEDGER ACCOUNT (Simple Average Method)

Name of Article……   Folio…...

Code…….   Maximum Level…...

Bin Card No…...   Minimum Level…...

Units…...   Recording Level…….

                                             Recording Quantity…...

Date	Particulars	Receipts			Issues			Balance		
		Qty	Rate Rs.	Amt Rs.	Qty	Rate Rs.	Amt Rs.	Qty	Rate Rs.	Amt Rs.
Oct 3	Goods Received Note No.	500	4.00	2,000	-	-	-	500	4	2,000
Oct 5	Requisition slip No.	-	-	-	400	4.00	1,600	100	-	400
Oct 13	Goods Received Note No.	900	4.30	3,870	-	-	-	1,000	-	4,270
Oct 15	Requisition slip No.	-	-	-	600	4.15*	2,490	400	-	1,780
Oct 23	Goods Received Note No.	600	3.80	2,280	-	-	-	1,000	-	4,060
Oct 25	Requisition slip No.	-	-	-	600	4.05[1]	2,430	400	-	1,630

Final Stock: 400 Materials: Rs. 1,680

$$* \quad \frac{Rs.\ 4 + Rs.4.30}{2} = \textbf{Rs. 4. 15}$$

$$1 \quad \frac{Rs.\ 4.30 + Rs.\ 3.80}{2} = \textbf{Rs. 4.05}$$

UNIT: 3

LABOUR COSTING

CONTROL OF LABOUR COST -LABOUR TURNOVER – METHOD OF WAGE PAYMENTS - REMUNERATION AND INCENTIVES - TIME RATE SYSTEM - PIECE RATE SYSTEM - PREMIUM AND BONUS PLANS.

LABOUR COST

INTRODUCTION:

Labour constitutes the second important major of cost but equally important is the cost of raw materials. As far as the material is concerned, rigid policies of control can be laid down. At the same time, so much degree of control cannot be exercised on lab our, rather it is not possible to expect it to be controlled   therefore, the right man at the job must be appointed. Lab our cost may be more because of inefficient lab our, abnormal idle time, unwarranted overtime, increase of waste, spoilage etc.

DEFINITION:

According to ICMA, DIRECT LABOUR cost is that cost which can be identified with and allocated to cost centres or cost units.

DIRECT LABOUR:

The cost of remuneration for employee's effects and skills is applied directly to product or a saleable service.

INDIRECT LABOUR:

On the other hand, indirect lab our cannot be conveniently identified with cost unit or cost centre. ICMA defines wages as "cost other than direct wages cost. Indirect labour costs are wages paid to supervisors, inspectors, foremen, watchmen, time-keepers, repairers, cleaners etc.

CONTROL OF LABOUR COST:

The control of labour is very important. Engaging unfit persons in the factory, results in poor output at high cost of production; in turn the product finds no place in the market or fetches less profits, and a time arrives when the industry has to be closed down. Therefore, the management takes measures for an effective control on the labour. Labour cost includes monetary benefits and fringe benefits.

INSTRUMENTS OF LABOUR COST CONTROL:

The aim of labour cost control is to keep the cost of labour at the minimum. That too at the present age, the stiff competition and the survival policy have forced all industries to reduce the cost of production. Therefore, the management looks for the methods to be adopted for the most favorable labour cost control. These can be achieved though:

1. The scientific methods of selection personnel.
2. Imparting training to them.
3. A good system of incentives.
4. Production planning made in advance.
5. Time and motion studies which help to determine standards of time required for each job.
6. A proper system of job evaluation.
7. Introducing mechanical devices in labour costing.
8. A good system of control over idle time and over –time.
9. Control over labour turnover radio.
   Coordination and cooperation among the workers of the concern.

DIFFERENT DEPARTMENTS:

To carry out all the aimed schemes mentioned above, and to have a good effect from the functional point of view, in a large concern, the following departments are involved

1. The personnel department
2. The engineering department
3. The rate or time and motion study department
4. The time-keeping department
5. The cost accountancy department

6. The pay-roll department

THE PERSONNEL DEPARTMENT:

The personnel department is headed by a personnel officer. he is a responsible per-son, who deals with employment discharge and transfer of the employee's requisition for placement of work-errs is sent by different departments to this personnel department and the department proceeds for action in selecting personnel, locally or calling for applications through advertisement or employment exchange. Labour placement requisition preformed is given below.

PROFROMA I
LABOUR PLACEMENT REQUISTION

Department…….   Requisition No.

 Date

Please arrange for workers mentioned below with effect from 30th September….

Number of employees Required	Category	Specification of jobs	Description	Remarks

Requisitioned by…   Approved by….

On receipt of the labour placement Requisition, the personnel department takes initiative to appoint the applicants through tests, interviews etc. by the personnel officer or the committee, and if satisfied, appointment orders are issued, giving copies to the appointee, Requisitioner and the pay-roll department. The personnel department will have to keep a personnel Record Card or Employee's History Card. In it full and relevant records of the employee have to be written. The proforma of the Employee's History card given is self- explanatory.

PROFORMA 2
EMPLOYEE'S HISTORY CARD

(Personnel Record Card)

Clock No………….   Department……….

Name………….   Category……….

Address………   Grade……….

Permanent……….   Starting pay…….

Temporary…….   Previous employee….

Education……….   Reason for leaving the job…

Date of birth……….

Marital status………

No. of children…….

Ht …. Wt…….

General physique

Employment Record				Training and Progress		Reasons for change (Promotion increment)	Remarks
Date	Department	Grade	Remarks	Date	Particulars		

METHODS OF TIME-BOOKING

Time-booking may be done manually or mechanically; the manual system is followed by small firms, and the mechanical system of recording is followed by large firms. The following are the methods;

1. Daily Time Sheets:

In small concerns, every worker is provided with a daily time sheet on which the particulars of time spent on each job are recorded daily. The workercompletes the sheet daily and hands it over to the foreman for verification and signature.

The form is given below

PROFORMA 3

Daily TimeSheet

Name………   Date………

Dept. Cost centre…….

Clock ticket No…….

Grade……….

Job No.	Description	Quantity (Work done)	Time		Hours	For cost office	
			In	Out		Rate	Amount

   Worker   **Certified by Forman**   **Costed by**

WEEKLY TIME SHEETS: The sheet is similar to the Daily Time Sheet, but since recordings are made for a week. This system is an improvement over the first one. It separate columns for each day. Different coloured sheets may be used for different departments. Sheets of this type are used by contractors, civil engineers etc. The specimen is given below-

Proforma 4

Weekly Time Sheet

Worker's Name... . . . .   Date...... .

Worker's No.   Week ending….. ……….

Department.... . ..……...

Day	Job No.	Description	Work done	In	Out	Hours	Rate	Amount
							For cost office	
Mon. Tues. Wed. Thurs. FRI. Sat.								

Worker   Foreman   Costed by

JOB CARDS

1. Job Card for each Worker.

Under this system, a card is allotted to each worker, at the beginning of each day or week. The time of starting and finishing the job is recorded. It is kept in the department. It explains the particulars of the jobon which a worker attends.

Proforma 5

Job Card for Each Worker

Name………………   Department………

Clock No……………   Week ending……………

Day	Job No.	Description	Time		Hours	For Cost Office	
			In	Out		Rate	Amount
Mon. Tues Wed. Thurs .Fri. Sat.							

Worker   **Foreman**   **Costed by**

2. JOB CARD FOR EACH JOB

Under this system, only one card is issued for each job. This type of card is used where the number of jobs to be done is large and each job has to pass through different workers to complete it. The total labour cost of each job can be found out easily.

Proforma 6

Job Card for Each Job

Job No………….   Time Started…………….

Job Description……………   Time Finished…………….

Operation No………….   Hour on Jobs…………….

Time allowance………….

Date	Operation	Dept.	Worker No.	Time		Total Hours	For Cost Office	
				In	Out		Rate	Amount
Total - -								

Deptt.

Costed by

Checked and Verified: Foreman

3. COMBINED TIME AND JOB CARDS

This type of card has dual purpose, i.e.., it shows the time- keeping and time – booking. through this card, the attendance and the time spent on jobs can be known. This card is used when the number of workers employed is few the specimen is given below.

Proforma 7

Combined Time and Job Card

Workers Name....   Week ending......

Workers No.....

Department....

Day	Job No.	Time		Time		For cost office	
		In	**Out**	**Ordinary**	**Over**	**Rate**	**Amount**
Mon							
Tues							
Wed							
Thrus							
Fri							
Sat							

Worker   Cost by

Foreman   Wages abstract by

4.PIECE WORK CARD

Certain factories pay wages on piece-work basis and to each worker a piece-work card is issued.in piece –work the quantity of work done is important but not the time spent by the worker. the output of each worker is measured. The work reject, it if the product is of substandard quality.

Proforma 8

Piece Work Card

Workers Name....   **NO.....**

Workers No.....   **Week ending.......**

Dept........   **Time taken....**

                                                                      Quantity........

Day	Description of Work	Job no	Time		No. of units			For cost office		Initials	
			In	**Out**	**Made**	**Rejected**	**Accepted**	**Rate**	**Amount**	**Worker**	**Inspector**
Mon											
Tue											
Wed											

Thu										
Fri										
Sat										

IDLE TIME

When workers spend their whole time at different jobs, then time booked for jobs must agree with the gate time.

Idle time is that for which the employer pays without any benefit to him. Idle time is of two types-normal idle time and abnormal idle time. For example, machine breakdown, waiting for work, waiting for instruction, power failure, shortage of materials, strikes, lockout, etc...,

CONTROL OF IDLE TIME

Following steps are suggested to control idle time:

1. Vigilance must be exercised to control and eliminate idle time
2. The introductions to the workers should be given in advance so that workers need to wait
3. Plant and machines should be maintained properly so that their breakdown can be avoided
4. The causes of the idle time should be found out and the root cause must be removed
5. Regular and timely supply of raw materials must be made available through a good system of storing materials

IDLE TIME CARD

Worker's name…….   Date……

Workers no…………

Shop/Dept………….

Reasons for idle time	Time		Time lost	For cost office		Remarks
	From	To		Rate	Amount	
1.waiting for Materials Tools Orders Instruction Inspection						
2.Power cut						
3.Breakdown of machines						
4.Fire, floods etc….						
6.Any other						

Worker………   Foreman…….   Costed

by…………

LABOUR TURNOVER

Labour turnover may be defined as the rate of change in the labour force, i.e., it denotes the percentage of change in the labour force of an organization. In other words, it is a term used to describe the movement of shifting into and out of an organization by the employees. The methods of measurement are:

1. Separation Method

Under this method, labour turnover for any period is measured by dividing the total number of separations by the average number of workers on the roll, then multiply by 100.Thus

Number of Separation during a period

Labour Turnover = _____* 100

Average No. of workers during the period

2. Replacement Method

Under this method only the actual replacement of labour during a period is taken into account irrespective of the number of workers leaving. Thus

No. of replacements in a period

Labour Turnover = _____ *** 100**

Average No. of workers in the period

When new recruitment is there for expansion purpose, they should be excluded from the number of replacements.

3. Flux Method

Labour turnover is obtained by dividing the total number of separations and replacements by the average number of workers. Thus

No. of additions + No. of separations

Labour Turnover = _____ *** 100**

Average No. of workers during the period

ILLUSTRATION 1.

From the following particulars supplied by the personal department of a fire, calculate labour turnover:

Total number of employees at the beginning of the month	2010
Number of employees who are recruited during the month	30
Number of employees who left during the month	50
Total number of employees at the end of the month	1900

Solution:

(a) Separation Method:

No. of separations in a period

Labour Turnover = _____ *** 100**

Average No. of workers in the period

$$\frac{50}{2{,}000} = 2.5\%$$

(b) Separation Method:

$$\text{Labour Turnover} = \frac{\text{No. of replacements in a period}}{\text{Average No. of workers in the period}} * 100$$

$$\frac{30}{2{,}000} = 1.5\%$$

(c) Flux Method

$$\textbf{Labour Turnover} = \frac{\textbf{No. of additions + No. of separations}}{\textbf{Average No. of workers during the period}} * \textbf{100}$$

$$\frac{50+30}{2{,}000} * 100 = 4\%$$

NB: Average No. on Rolls = $\dfrac{\textbf{2010 + 1990}}{\textbf{2}}$

= 2,000

ILLUSTRATION 2.

The personal department of a concern gives you the following information in respect of labour

No. of employees on 1st Jan   1800

No. of employees on 31st Jan   2200

During the month 20 persons quit and 80 persons are terminated 300 workers are needed of these,50 workers are recruited in the vacancies and the engaged in the expansion scheme. Calculate the L.T.R.

Solution:

$$\text{Average No. of workers (Jan.)} \quad \frac{1800 + 2200}{2} = 2000$$

Labour Turnover Rate

(a) Separation Method $= \dfrac{(20 + 80)}{2000} * 100 = 5\%$

(b) Replacement Method $= \dfrac{50}{2000} * 100 = 2.5\%$

(c) Flux Method $= \dfrac{100 + 50}{2000} * 100 = 7.5\%$

CAUSES FOR LABOUR TURNOVER

The causes can be broadly divided in two categories

(A) AVOIDABLE CAUSES

    1. Dissatisfaction with job

      2. Dissatisfaction with wages

      3. Poor working condition

      4. Unsuitable working hours

      5. Non co-operative attitude

      6. Lack of promotion

      7. Unfair method of promotion

8. Unsympathetic attitude of management

9. Inadequate protection

10. Weakness (employee-employer-relation)

(B) UNAVOIDABLE CAUSE

1. Quitting the job (due to inefficiency)

2. Lack of work

3. retirement or death

4. Accident or illness

5. Marriage

6. Disliking a job

7. personal betterment

8. Workers roving nature

9. National service

EFFECT OF LABOUR TURNOVER

1. Fall in production

2. Increased in cost, selection, training etc.

3. Dislocation of even flow of production

4. Increase of scrab, defective work,

5. Additional supervision etc.

6. Higher accident rate

7. Mishandling of machine

8. Instability of labour and their low team sprit

METHODS OF REDUCING LABOUR TURNOVER

Following measures are suggested to the management to maintain a happy and contented labour force:

- Better working conditions may be provided to workers.

- Selection of candidates must be made on the basis of Scientific principles and workers must be placed on Appropriate jobs.

- We organized programmers must be chalked out to increase their efficiency.

- There must be a cordial relation between employer and employees.

- There must be job security and opportunities for career advancement.

- A good wages policy and incentive plans must be devised
- An effective grievance procedure is to be adopted.
- Labour participation in management must be encouraged
- A good working condition conducive to health and efficiency should be provided.
- The personal department must prepare a periodical report, relating to causes of labour turnover and suggest remedies.

COST OF LABOUR TURNOVER

The cost of labour turn over can be divided into two heads _preventive costs and replacement costs. The effects of labour turnover, when it is expressed in terms of money, can be called the cost of labour turnover

Preventive costs are incurred in preventing the workers from leaving by providing the following: good working conditions, high wages, medical and housing facilities, educational facilities, educational facilities to their children, subsidized meals, welfare etc.

Replacement costs are concerned with the loss of production because of delay in recruiting new hands and costs of training, scrap, wastages, tool breakages, high cost of supervision etc.

REMUNERATION

INTRODUTION

Labour is one of the four factors of production. Labours is of two kinds-direct and indirect. Both kinds of labour are employed in an organization. They have to be paid remuneration for the services rendered by them. Labour costing is the responsibility of the Cost Accounting Department. In order to prepare pay-rolls labour hours are to be converted into money at the rate prevalent.

REMUNERATION

Remuneration is a reward for the labour and service. But incentive schemes are stimulation of effort and effectiveness. Remuneration to labour is the most complex problem, especially in a country like India, because there is no single method of solution which is acceptable to both. Employees want wage rise and employers want to keep down the wage rate.Such situations conflict each other. Therefore, the wage system should be planned carefully. There must be a wage system, which increases the efficiency and at the same time brings **satisfaction to the workers.**

1. The wage system adopted must be simple so that the workers may be able to understand it.

2. The system must ensure satisfaction to both the employees and the employer.

3. It should be based upon scientific time and motion study.

4. It should guarantee a minimum wage at satisfactory level.

5. It should enable an efficient worker to earn more.

6. It should reduce labour turnover.

7. It must be accepted by the trade unions.

8. It must increase the morale of the employees.

9. It should be according to the capacity to pay.

10. It should be flexible to adjust to the changes in the cost of living.

11. The cost of the scheme must be minimum.

12. It should encourage productivity.

13. It should not be in violation of Government policy.

14. It should minimize absenteeism.

15. The method should be correlated to the capacity of the firm to pay.

TIME RATE SYSTEMS

        a) At ordinary levels

        b)   At high wage levels

        c) Guaranteed time rates.

Time rate system (Day rate) (Flat rate)

(a) Time rate at Ordinary levels

This is the simplest, oldest and the most common method of wages payment. The system under which the payment is made to the workers according to the time for which they work is known as Time Wage System. Again, under this method, payment is made on the basis of time, which may be an hour, day, week or a month, irrespective of the output. It means that a definite amount of payment is guaranteed for the specified time. The payment is calculated as follows:

Earnings = Hours worked $_+$ rate per hour.

The method is suitable in the following cases:

1. Where quality of work is more important than quantity of work, e.g., watch-making, precision work, tool-making, testing etc.

2. Where it is difficult to measure the work accurately, as in the case of indirect workers, such as watchmen, supervisors, drivers, cleaners etc.

3. Where machine restricts the speed, the operator has no control, e.g., the flow of work is regulated by the speed of conveyor belt.

4. Where the operation or job is not repetitive.

5. Where earners or apprentices are working.

6. Where the work is to be done by experts, skilled workers etc.

7. Where a worker does the work in his own interest.

(b) Time Rates at High Wages Levels

This system is similar to the previous one, except that the time rate is high, higher than the time rate at ordinary levels, in order to have a higher standard of performance. The high rare is equally effective as that of other incentive plans. High wages increase labour cost unless it is compensated by an increase in production. Overtime is not permitted.

(c) Guaranteed Time Rates

Under this system the payment is at the time rates, but adjusted to the cost of living. Merit awards for personal qualities, skill, ability, punctuality etc., are also considered. The employer is not losing, but compensates it by increasing the price of the products. In any case, it is difficult to determine the wage index, though the scheme is acceptable to all.

PIECE RATE SYSTEM

There are three types:

STRAIGHT PIECE RATE

Under this system the worker gets a flat rate per unit of output. His earnings i.e.,

Piece work earnings =Rate per unit * units produced

PIECE RATE WITH GUARANTEED TIME RATES

Under this system, a worker gets a fixed amount of wage, and he is also paid for the performance beyond a prescribed limit. Suppose a worker working under piece rate System produces 4 units at the rate of Re.1, while the day rate is fixed at Rs.5, he will Be paid Rs.5, (whereas he is eligible for Rs.4). But whenever he exceeds the limit of Rs.5, the excess amount will be recovered. The system is a complicated one and hence not Followed.

DIFFERENTIAL PIECE RATE

Under this scheme, the rate per piece is increased, as the output level is Increased. That is, there is more than one piece rate systems. In other words, the Increase in rates may be proportionate to the increase in output. By this system, Inefficient workers are encouraged to earn more. This system is suitable where:

1.The work is of repetitive nature.

2.Output can be identified with individual works. There are three principle systems:

1.TAYLOR DIFFERENTIAL RATE SYSTEM

F.W. Taylor, the father of scientific management, introduced this system.

According to this system:

1. There are two-piece rate systems-one is lower and the other is higher.

2. Lower piece rate is for the output below the standard and higher piece rate is for the

Output above the standard.

3. For each job, standard time is stipulated.

This system penalises the slow worker by having low rate, because of low Production, and rewards an efficient worker by giving him high rate because of higher Production. Indirectly, this system gives no inefficient work. In other words, if the Output of a worker is less than the standard output, he gets low rate and vice versa.

ILLUSTRATION 1

On the basis of the following information, calculate the earnings of x and y under the Straight Piece Rate System and Taylor's Differential Piece Rate System:

Standard production   :   10 units per hour

Normal time rate   :   Rs. 5 per hour

Differential piece rate to be applied:

80% of piece rate for below standard performance

120% of piece rate for performance at or above the standard.

Actual performance:

X produced 80 units in a day of 10 hours.

Y produced 110 units in a day of 10 hours.

SOLUTION:

Standard time allowed for 10 units in one hour.

Time rate is Rs.5 per hour

Hours for one unit = Rs. 5/10 = Re. 0.50

Straight Piece Rate System

X for 80 units @ Re. 0.50 per unit gets = 80 x Re. 0.50 = 40.00

Y for 110 units @ Re. 0.50 per unit gets =110 x Re. 0.50 = Rs. 55.00

Differential Piece Rate System:

Low piece of rate (80%) of piece of rate

$$= Re. 0.50 * 80 / 100 = Re. 0.40$$

High piece rate (120%) of piece of rate

$$= Re. 0.50 * 120 / 100 = Re.0.60$$

Standard output in 10 hours = 100 units.

X produced 80 units (below Standard)

Therefore, earnings = 80 * Re.0.40 = Rs. 32.00

Y produced 110 units (above standard)

Therefore earnings = 110 * Re. 0.60 = Rs. 66

THE MERRICK DIFFERENTIAL PIECE RATE:

It is modification of Taylor System, in order to reduce the penalisation of slow workers those, these persons are encouraged. Therefore, He introduced three rates in the place for two theyare:

Efficiency	Piece Rate Applicable
1.Up to 83%	Basic Rate (normal rate)
2.From 83% to 100%	110% of basic piece rate
3.Above 100%	120% of basic piece rate

Workers, who are efficient and experienced, whose performance is more than 100 % can earn wages at 120% of the ordinary piece Rate.

This scheme doesn't guarantee day wages. The workers who are below standard performance are not penalised. at the same time efficiency above 100 % is Rewarded. This system is beneficial two trainers and beginners.

3.GANTT TASK AND BONUS SCHEME

This is a system combined with time, piece rate and bonus. Time wages are guaranteed to workers, who fail to reach the standard. The main features are:

1. Standards are set and bonus is paid, if a worker completes the work within the standard time.

2. Day wages are guaranteed.

3. A worker who could not complete the work within the standard time is paid on time wages.

The remuneration is payable.

Output	Remuneration
(A) Output below standard	Time rate (guaranteed)
(B) Output at standard level	Bonus of 20 % of the time rate

(C) Output above mentioned   High piece rate on worker's output

ILLUSTRATION 2.

The following are the particulars applicable to a work process. Time rate: Rs. 5 per hour

High task: 40 units per week

Piece rate above high task: Rs. 6.50 per unit.

In a 40-hour week each of the following workers produced:

A   35 units

B   40 units

C   41 units

D   52 units

Calculate the wages of the workers under Gantt's Task Bonus Plan.

Solution:

Under Gantt's Task and Bonus Plan, wages are computed as follows:

Output	**Rate**
Below standard	Guaranteed wages
At standard	Bonus of (usually) 20 % on worker's whole output.
Above standard	High piece rate on worker's whole output.

The wages of the workers will be as follows:

A   40 * 5 =   Rs. 200 (time wages)

B   40(120*5)100 =Rs. 240 (bonus of 20 %)

C   41*6.50= Rs.266.50 (High piece rate)

D   52*6.50= Rs.338(high piece rate)

PREMIUM BONUS SCHEMES (INCENTIVE SYSTEMS)

The system of wage payment is of two types time rate system and piece rate system. In the plan of incentive wage payment, both time and piece rate are blended together. Under time rate system, the worker is not benefitted for the time saved. Under piece rate system, the cost per unit falls, even though labour cost remains constant. This is due to savings in fixed overhead expenses, since the cost of overhead is distributed over all the units.

The purpose of this scheme is to overcome the limitation of both the systems and combine the advantages of both the systems. In order to increase the production through encouragement the benefits are shared by employer and the employee.

Before the introduction of incentive plan, the **following factors** may be taken into consideration:

- It must be simple and understandable to workers.
- It must be fair to both employer and employee.
- The standard should be fixed by time and motion study.
- Standards once fixed may not be altered.
- The cost of operating the scheme should be minimum.
- The work must be repetitive by nature.
- The workers should not raise objections.
- The system must be permanent.
- The system should be also benefit the indirect workers.
- It must reduce labour turnover.
- Employer-employee-customers are to be benefitted.

The various schemes and premium bonus plans should combine time wages and piece rates. The schemes of them are:

The Halsey Premium plan

This system is also known as Split Bonus Plan or Fifty-Fifty plan. The plan was introduced by F.A. Halsey, an American engineer. In the Plan, the task (standard) time, is decided on the basis of past experience, and scientific studies are set. Under this plan, a standard time is fixed for the

performance of each job, and the worker is paid the agreed rate per hour for the time spent thereon plus a fixed percentage (may be 50%) of the time, he saved on the standard.

Main Features

1. Standard time for each job is fixed.
2. Time rate is guaranteed.
3. 50% of the time saved plus normal earnings go to worker.

Labour Cost – Cost Accounting

Total earnings = Guaranteed wages+ Bonus (50% of time saved)

i.e., **Total earnings**= (Hrs. worked*Hourly rate) +50% of Time allowed – Time taken*Hourly rate

(or) **Total earnings** = TT*HR+50/100 (TA – TT) * HR (or) Total earnings = TT*HR+50/100 (TS*HR)

TT=Time taken (Hours worked);

HR=Hourly rate

ILLUSTRATION 3:

Calculate the earnings of a worker under Halsey Premium Plan.

Time allowed = 48 hour

Time taken = 40 hours

Rate per hour = Rs.10.

Solution:

Earnings Under Halsey Premium Plan

Time allowed = 48 hours

Time taken = 40 hours

Time saved = 8 hours

Rate per hour = Rs.10

Total earnings = TT*HR+50/100(TA-TT) *HR

= (40*Rs.10) +50/100(48-40) *Rs.10

= Rs.400+Rs.40

= Rs.440

Earnings under Halsey Premium Plan = Rs.440

The Halsey-Weir scheme

Here the worker gets a bonus of 30% of the time saved, against 50% in the Halsey plan. Expect this point, Halsey plan and Halsey-Weir schemeare similar.

ILLUSTRATION 4:

By solving illustration 3

Solution:

Earning Under Halsey-Weir Scheme

Time allowed = 48 hours

Time taken = 40 hour

Time saved = 8 hours

Rate per hour = Rs.10

Total earnings = TT*HR+30/100(TA-TT*HR

= (40*Rs.10) +30/100(48-40) *Rs.10

=Rs.400+Rs.24=Rs.424

Earnings under Halsey-Weir Scheme = Rs.424

Rowan Scheme

This scheme was introduced in the year 1901 by David Rowan of Glasgow. The guidelines of Halsey Plan have been followed. It is similar to that of Halsey Plan except in regard to the determination of bonus (calculation). Under this plan, the bonus is that proportion of the wages of the time taken which the time saved bears to the standard time allowed. Thus

Bonus= TS/ST*TT*HR

(Or)=Time Saved/Standard Time*Time Taken*Hourly Rate Total Earnings=Time Wages+ Bonus

Time Wages =Time Taken*Hourly RateTotal Earnings =(TT*HR) +TS/ST*TT*HR

TT =Time Taken

HR =Hourly Rate

TS =Time Saved (i.e., Time Allowed – Time Taken)ST = Standard Time

ILLUSTRATION 5:

By solving Illustration 3

Solution:

Earnings Under Rowan Scheme

Time allowed = 48 hour

Time taken = 40 hours

Time save = 8 hoursRate per hour = Rs.10

Total Earnings = (Time taken*Hourly Rate) +Time saved/Time allowed*Time taken*Hourly rate

= (40*10) +8/48*40*Rs.10

= Rs.400+Rs.66.70

=Rs.466.7

COMPARATIVE STUDY OF HALSEY PLAN AND ROWAN PLAN

Halsey	Rowan plan
1. It guarantees minimum time wages	1. It assures minimum time wages.
2. Bonus increases steadily with increase in efficiency.	2. Bonus increases up to a certain stage and then starts decreasing.
3. Bonus is 50% of the time saved.	3. Bonus is in that proportion of time taken, which the time saved bears to the standard time.
4. Gains of efficiency or shared by employer and employee equally (1:1)	4. Gains of efficiency are not shared equally.
5. If the time saved is more than 50% of the standard time, this plan is better.	5. If the time saved is less than 50% of the standard time, this plan is better.

Comparative figures of earning under Halsey premium plan and Rowan system

Rate per hour	Time allowed	Time taken	Time saved	Time wages	Bonus		Total earning		Earning per hour	
					Halsey	Rowan	Halsey	Rowan	Halsey	Rowan
1	2	3	4	5	6	7	8	9	10	11
3	10	10	-	30	-	-	30	30	3	3
3	10	9	1	27	1.50	2.70	28.50	29.70	3.17	3.30
3	10	8	2	24	3.00	4.80	27.00	28.80	3.38	3.60
3	10	7	3	21	4.50	6.30	25.50	27.30	3.64	3.90
3	10	6	4	18	6.00	7.20	24.00	25.20	4.00	4.20
3	10	5	5	15	7.50	7.50	22.50	22.50	4.50	4.50
3	10	4	6	12	9.00	7.20	21.00	19.20	5.25	4.80
3	10	3	7	9	10.50	6.30	19.50	15.30	6.50	5.10
3	10	2	8	6	12.00	4.80	18.00	10.80	9.00	5.40

The following points are clear from the above table:

1. When a work is completed in 50% of the standard time, bonus is the same in both the schemes.

2. Bonus increases steadily with the increase in efficiency under Halsey scheme. In Rowan scheme, the bonus increases up to a certain level, then starts declining.

3. When the work completed is less than 50% of the standard time, the amount of bonus under Halsey scheme is greater.

Illustration: 6

Standard time allotted for a job is 20 hours and the rate per hour is Rs.2 plus a dearness allowance @50paise per hour worked.

The actual time taken by a worker is 15 hours. Calculate the earnings under (a) Time system; (b) piece wages system (c) Halsey plan (d) Rowan scheme.

Solution:

(a)Time wage system:

Basic wages for 15 hours @ Rs.2 per hr.　　= Rs.30.00

 Dearness allowance for 15 hours @

　　50%paise per hour　　　　　　　　　　= Rs.7.50

　　　　　　　Total wages:　　　　**= Rs.37 50**

(b) Piece wage system:

 Basic wage for 20 hours @ Rs.2 per hour　　= Rs.40

Dearness allowance for 15 hours @

　　50paise per hour　　　　　　　　　　= Rs.7.50

　　　　　　　Total wages:　　　　**= Rs.47.50**

 (c) Halsey plan:

Basic wages for 15 hours @ Rs.2 per hour = Rs.30.00

Dearness all0wance for 15 hours @

      50Paise per hour   = Rs.7.50

Bonus: 50% of time saved hourly rate

      (50% of 5hours Rs.2)   = Rs.5.00

           Total wages: **= Rs.42.50**

(d) Rowan scheme:

Basic wages for 15hours @Rs.2 per hour = Rs.30.00

Dearness allowances for 15 hours @

      50paise per hour   = Rs.7.50

Bonus: (5/20 15 2)   = Rs.7.50

           Total wages: **= Rs.45.00**

Hourly earnings per hour:

        (a) Rs.37.50/15=Rs.2.5

        (b)   Rs.47.50/15=Rs.3.17

        (c)   Rs.42.50/15=Rs.2.83

        (d)   Rs.45.00/15=Rs.3.00

UNIT – 4

OVERHEAD COST CONTROL

MEANING - CLASSIFICATION-PROCEDURE - ALLOCATION AND APPORTIONMENT- PRINCIPLES OF APPORTIONMENT - REAPPORTIONMENT, DIRECT, STEP, RECIPROCAL, SIMULTANEOUS EQUATION TRIAL AND ERROR.

OVERHEAD COST CONTROL

MEANING:

Broadly speaking, every form of production involves two types(portions)of cost –direct and indirect. Direct costs can conveniently be identified with particular units of production, i.e., direct materials, direct labour and chargeable(direct) expenses. Indirect cost cannot be traced to any unit of production. The word indirect indicates that the cost accountant is either unable or unwilling to allocate cost to a particular cost unit, but it is generally apportioned to or absorbed by cost units or cost centers on a certain suitable basis. Over-head is also known as, 'overhead cost', 'overhead charges', 'non-productive cost', 'burden', 'loading', 'oncost' etc.

ICMA defines overhead as 'total cost of indirect materials, wages and expenses' Whelden says, "Overhead may be defined as the cost of indirect materials, indirect labor and such other expenses including service as cannot conveniently be charged to a specific unit. Alternatively, overheads are all expenses other than direct expenses". Blocker and Weltmer define, "Overhead costs are operating costs of business enterprise, which cannot be traced directly to a particular unit of output. Further such cost are invisible or unaccountable".

Again "Overhead" is 'the aggregate of indirect materials cost, indirect wages and indirect expenses' The total cost is broadly divided into (1) Prime cost, which is comprise Direct Materials, Direct labor and Direct expenses. Thus, the expenses incurred over and above the head of prime cost are known as Overhead Expenses.

CLASSIFICATION:

There are various method of classifying or grouping overheads, which greatly depend upon the objectives of classification, the type or the size of the firm. Generally, the following is the classification according to:

1. Nature
2. Function
3. Variability
4. Normality
5. Control

CLASSIFICATION ACCORDING TO NATURE:

Overhead is defined in the Terminology of Cost Accountancy as "the aggregate of indirect material cost, indirect wages and indirect expenses". Here the definition is followed. According to this classification, overhead can be classified into (a) indirect materials (b) indirect labor and (c) indirect expenses.

a) **Indirect Material:**

The cost of materials, which cannot be allocate to a particular unit and does not form a part of the finished product, is termed as indirect materials. For example, consumable stores fuel, small for general use, lubrication oil, cotton waste, losses and deterioration of stores etc.

b) **Indirect Labor:**

Labor charges which cannot be allocated to a particular unit of cost is called indirect labor or wages. For example, salary of the foreman, wages for maintenance worker, overtime, holiday pay, idle time, employer's contribution to provide fund etc.

c) **Indirect Expenses:**

Most item of expenditure are classified as indirect, since they are incurred for the business as a whole, rather than in regard to a particular product. For example, rent, rates, insurance, taxes,

canteen and welfare expenses, lighting and heating, hospital and dispensary, training, depreciation of plant, machine building etc.

CLASSIFICATION ACCORDING TO FUNCTION:

The classification of overhead expenses with reference to the major activity of a concern is known as function-wise classification. The main group of this classification are (a) Manufacturing overhead, (b) Administrative overhead, (c) Selling overhead and (d) Distribution overhead.

a) **Manufacturing overhead:**

It is also known as worker overhead, production overhead or factory overhead. It is the aggregate of the indirect expenses of operating the manufacturing division of a concern and includes all expenses incurred by the concern from the receipt of the order till is completion, ready for dispatch. It includes all overhead cost incurred from the stage of procurement of materials till the completion of the finishes product but excludes expenses on administration, selling and distribution. Some typical examples are given below:

- Rent, taxes, depreciation, insurance etc. of the factory land and buildings.
- Consumable stores, small tools etc.
- Cost of overtime, idle time, holiday pay etc.
- Fuel, power, coal etc.
- Factory lighting, heating, air-conditioning etc.
- Welfare expenses, canteen, recreation club etc.

b) **Administrative Overhead:**

According to the Terminology, "It is the cost of formulating the policy, directing the organization, and controlling the operations of an undertaking, which is not related directly to the production, selling and distribution, research and development activity or function". In other words, this class includes the expenses of managerial functions of direction, planning and controlling the operation of business, other than selling and distribution, research and development.

(C) **Selling Overhead**:

It means the cost of seeking to create and stimulate demand, in securing orders for the product. Thus, expenses in promoting sales and retaining customers are the main idea.

The expenses pertaining to selling are:

- Advertisement, general market research and analysis.
- Salaries and commission of salesmen and selling agents.
- Travelling expenses of sales-people.
- Cost of free-gifts, samples.

(d) Distribution Overhead:

It means the expenses connection with or incurred from the stage the product is completed in the works till the product reaches its destination. The expenses pertaining to delivery of sold goods to the customers fall under this group:

- Cost of packing materials(secondary).
- Carriage outward and transport expenses.
- Salary of warehouse staff.
- Loss of warehouse stock.
- Repairing of empties.
- Expenses of warehouse van, trucks etc.

CLASSIFICATION ACCORDING TO VARIABILITY:

Expenses are also classified on the basis of behavior or variability; it can be found that all items of overhead do not vary in sympathy with production. Based on this behavior, the expenses can be divided into (a) Fixed (b) variable and (c) Semi-variable or semi-fixed.

a) **Fixed Overhead:**

Fixed overhead or constant charges or period costs remain fixed in their nature and do not vary with changes in the volume of output. There are certain expenses which must be paid, whether the factory is working or not. These expenses accrue over a period of time, hence known as time or

period costs. Such expenses remain constant even if the volume of production changes; when there is more production, and the fixed overhead is true only for a shorter period, and in the long run, there occurs the change. Examples for this context are salaries of staff, taxes etc. Example for fixed cost are: depreciation of plant, rent of storage-house and building, postage, stationery, salaries, insurance etc.

b) **Variable Overhead:**

Variable or fluctuating overhead is a cost which, in the aggregate, tends to vary in direct proportion to changes in the volume of output or turnover. In other words, these costs change in the same ratio in which output changes. Total variable cost will tend to vary directly with volume, while unit variable cost is likely to remain constant at all levels. For example, indirect material, indirect labor, power and fuel, spoilage, stores handling, overtime etc.

c) **Semi-Variable Overhead:**

This type of overhead, varies with a change in the volume of output, but not in such a proportion as the output changes. This type stands mid-way between fixed and variable overhead. Semi-variable or Semi-fixed overheads may remain fixed at certain levels of output, while they vary at other levels, but not in the proportion of output changes. For example, repairs and maintenance, depreciation of plant and machinery, telephone, salary to supervisors etc.

CLASSIFICATION ACCORDING TO NORMALITY:

According to this class the costs are divided into two types – **normal overhead** and **abnormal overhead.**

Normal expenses are expected to be incurred in attaining a given output. These are unavoidable. These can be included in production cost.

Abnormal costs are those which are not expected to occur in attaining a given output; for example, abnormal idle time, abnormal wastage etc. Such expenses may be transferred to costing profit and loss account.

CLASSIFICATION ACCORDING TO CONTROL:

It is also known as control-wise classification. It can be divided into two types controllable costs and uncontrollable costs.

Controllable costs are those which can be controlled by an efficient management. For example, idle time, wastage etc. can be controlled.

Uncontrollable costs are those which cannot be controlled. All types of fixed costs are the best example. In the light of the above discussion, there are a number of advantages which are helpful for an efficient running of a firm. In brief the usefulness of cost classification on the basis of variability is as follows:

a) **Cost Control:** When cost is classified as controllable and uncontrollable, generally all fixed costs like rent, rate, insurance etc., fall under the uncontrollable classification; the costs cannot be controlled and remain constant even at the level of zero output. The controllable costs are variable costs which can be controlled. Variable costs can be controlled by lower levels of the management. By splitting the expenses, one can know the type of expenses, which can be controlled. Therefore, for the purpose of cost control, this type of classification is very useful.

b) **Fixation of Selling Price**: As far as the pricing policy is concerned, this type of classification is helpful in fixing the price. It may happen, sometimes that different prices are charged for the same article on the basis of competition in different markets. Whatever it may be, the lowest price may cover at least cost-plus variable expenses.

c) **Marginal Cost:** Costs are divided into fixed and variable cost. The variable costs are taken into account in marginal costing. Marginal costing is a technique used in industries for profit planning, cost control etc. It also discloses whether it is profitable to manufacture a product or to buy it from the market. For preparation of break-even charts and the study of cost-volume-profit relationship, distinction between fixed cost and variable cost is essential.

d) **Decision-Making:** Managerial decisions greatly depend on fixed and variable costs, mainly dealing with fixation if price at depression, introducing new lines, alternative methods of production, replacement of old machines by new ones, introduction of new products etc.

e) **Overhead Absorption:** There are many methods to absorb overheads; and rates are different on fixed and variable overhead. If the absorption rate is pre-determined, there arises a variation between the cost absorbed and the cost incurred. This variation may lead to a problem of under or over absorption. The variation arises out of the two types of overhead. Therefore, it is necessary to divide the overhead into fixed and variable, in order to compute separate rates of absorption.

f) **Unit Cost of Production:** When production increases, the fixed overhead cost per unit decreases. But variable cost per unit remains constant. To analyze the cost of production and its fixation, it is essential to find out the fixed cost per unit and variable cost per unit.

PROCEDURE OF LINKING OVERHEADS TO COST UNITS:

Overheads are indirect costs, as such, it is not possible to charge specifically to cost units. When ascertaining the factory cost of a product, overhead is to be added to the prime cost of the product. As far as the direct materials, direct labor and direct expenses are concerned, there is no trouble in cost ascertainment, as they can be directly charged. Therefore, our main problem is to link the overloads to cost unit. The procedure involves the following steps:

1. Classification and collection of overhead.
2. Distribution of overload to production and service departments.
3. Redistribution from service departments to production department.
4. Absorption of overhead by production units.

CLASSIFICATION AND COLLECTION OF OVERHEAD:

The first step is to classify the overheads in a systematic manner, as explained in the classification i.e., into function-wise, element-wise, behavior-wise, control-wise, normality-wise etc. These have been explained.

In order to ensure uniformity and accuracy in the accumulation of overheads and classification, a separate system is to be developed. That is, a standing order number is to be center. In all the requisition notes, the code of the department or cost center must be given, so that collection of overhead will be an easy job.

Collection of overhead under separate standing order numbers provided when expenses incurred, must be entered in the relevant documents at the source itself, against the standing order numbers. Analyze the transaction of manufacturing overhead and classify according to standing order numbers. It is necessary to allot suitable account headings for each type of overhead. Such account headings may be standing order numbers or cost account numbers. Standing order numbers cover production overhead items and cost account numbers cover administrative, selling and distribution overheads. This process helps in grouping like items in a convenient manner. Thus, collection processes are done without confusion. The following are the main documents from where overhead expenses are collected:

(a) Invoice (b) Stores Requisition (c) Wage Analysis Book (d) Cash Book (e) Subsidiary Records.

(a) Invoice:

Invoices for the purchases of material are entered in the purchase journal, specially for the purpose of cost collection. And the items of cost are further divided according to standing orders. At the end of the period, the total of the purchase journal is debited to the Factory Overhead Account and the corresponding credit is given to the Cost Ledger Control Account.

(b) Stores Requisition:

Whenever indirect materials are drawn from store against the stores requisition, the standing order numbers and code of the respective departments are mentioned in it. Thus, the departmentalization is done at the source. From the requisition, a material analysis sheet is prepared. At the end of the month, the total of these is debited to the production overhead account and corresponding credit to the stores ledger control account.

(c) Wage Analysis Book:

Indirect wages are booked against respective standing orders for each department on the basis of Time Cards or Job Cards. The wage analysis book is prepared from time to time on the basis of the cards. The total of the wage analysis book is debited to production overhead account and credited to wages control account.

(d) Cash Book:

Where frequent transactions involving petty expenses take place, the cash book is carefully scrutinized. All indirect expenses for each department are collected against standing order numbers.

(e) Subsidiary Records:

There are many items of expenses which do not result in current cash outlay, such as depreciation, notional rent, interest etc. Which need adjustments. The amount of depreciation can be had from plant and machinery register. Scrap, waste, idle time etc., can be had from special reports. As such, a proper scrutiny of all such records will facilitate the correct accumulation of overhead.

DISTRIBUTION OF OVERHEAD TO PRODUCTION AND SERVICE DEPARTMENT:

Certain items of overhead cannot be allocated to cost unit or a particular product, but can be allotted to departments. In a broad way, manufacturing concern can be divided into production departments and service departments. Each department has a specified job to be done.

(a) Production Department:

It is a department where production or manufacturing process is carried on. The process of conversion of raw materials into finished goods by performing some operations on the raw materials takes place here. The number and size of the department depends upon the nature of the concern. In short, a production or manufacturing or producing department is one where manual or machine operations are carried out for the purpose of getting finished goods.

(b) Service Department:

This department is not directly engaged in productions, but renders services to the production department for efficient functioning of manufacturing works. Here, raw materials are not converted into finishing goods. For example, personnel department, planning, tool-room, hospital, machine, inspection section, maintenance, fire-fighting etc.

ALLOCATION AND APPORTIONMENT

'Allocation' has been defined by the Institute of Cost and Management Accountants, London, as "the allocation of whole items of cost-to-cost center or cost units". Allocation of overhead is the function of identifying overhead items with particular cost center or production and service departments. Allocation is the process of charging the full amount of overhead costs to a particular cost center. This is possible when the nature of expense is such that it can be easily identified with a particular cost center. For example, salary of the Sales Manager is allocated to the Sales Department.

'Apportionment' has been defined by the Institute of Cost and Management Accountants as "the allotment of proportions of cost-to-cost center or cost units". Apportionment of overhead is the process of distributing those items of overhead which cannot be allocated to a cost center or department, between cost center or departments on an equitable basis. It is the process of splitting up an item of overhead cost and charging it to the cost center on an equitable basis. That is, where the expense is a common one and it is to be allotted to different cost center proportionately on an appropriate basis, it is known as apportionment. For example, factory rent is an expense which cannot be allocated to any one department, but is to be shared by all the production departments and service departments on suitable basis.

Importance

Manufacturing establishments are extensively progressing by the adoption of heavy and costlier machines. Plant automation through new inventions, brings a heavy expenditure to the firm, aiming at mass production. Therefore, the overhead cost also increases. These heavy expenses cannot be afforded by cost units or cost center. Evens, in normal stage, the overhead expenses form a greater part of the cost of production. These heavy expenses may be treated as

cost common to all units of production and cannot be charged to a particular cost center. Therefore, a proper system of controlling and accounting of overhead has become necessary and inevitable.

Simultaneous Equation Method

The total overhead cost of service department is ascertained with the help of simultaneous equations. The result obtained through the help of simultaneous equations is redistributed to the production department on the basis of given percentage.

Illustration: 1

Particulars	Total	Production Depts.			Service Depts.	
		A	B	C	P	Q
		Rs.	Rs.	Rs.	Rs.	Rs.
Rent	12,000	2,400	4,800	2,000	2,000	800
Electricity	4,000	800	2,000	500	400	300
Indirect labor	6,000	1,200	2,000	1,000	800	1,000
Depreciation	5,000	2,500	1,600	200	500	200
Sundries	4,500	910	2,143	847	300	300
Total	31,500	7,810	12,543	4,547	4,000	2,600
Estimated Working hours		1,000	2,500	1,400		

Expenses of service Departments P and Q are apportioned as under

	A	B	C	P	Q
P	30%	40%	20%	_	10%
Q	10%	20%	50%	20%	_

Solution:

Let a be the expenses of service Department P

Let b be the expenses of service Department Q

Therefore $a = 4,000 + 0.2b$ … (1)

$$b = 2,600 + 0.1a \quad (-0.1a = 2600 - 1b) \quad .. (2)$$

Multiplying equation (1) by

$$5a = 20,000 + 1b \qquad \ldots (3)$$

Adding equation (3) and (2) we get,

$$4.9a = 22,600$$

$$a = 4,612, \text{ substituting equation (2)}$$

$$b = 3,061$$

OVERHEAD DISTRIBUTION SUMMARY

		A	B	C	P	Q
Given (Total)	Rs.	7,810	12,543	4,547	4,000	2,600
Expanses of P Rs.		1,384	1,845	922	(-)4,612	461
Expanses of Q	Rs.	306	612	1,531	612	(-)3,061
		9,500	15,000	7,000	_	_
No. of hours		1,000	2,500	1,400		
Rate per hour	Rs.	9.50	6.00	5.00		

Overhead Cost	Bases For Distribution
• Electric Power	• Horse-Power of machines, KWH
• Electric Light	• No. of light points, floorspace, hours direct used (if metered)
• Depreciation of plant etc.	• Capital Value
• Delivery expenses	• Weight, Volume etc.
• Audit fees	• Sales or total cost
• Supervision	• No. of employees
• P.F and contributions to E.S.I.	• Direct Wages
• Rent, rates, depreciation, repairs of factory building	• Floor space occupied
• Store- Keeping	• Weight or value of materials handled
• Advertising	• Actual expenses or % of sales
• Personnel Department, Time and Wage Office	• No. of. employees
• Safety	
• Recreation	• No. of employees or total wages.

Reciprocal Service Method

When there are two or more service departments, it is recognized that they render services to each other. These inter-departmental services (inter-service transfers) are taken into consideration, and are not ignored in redistributing expenses of the service department. There are mainly three methods: Repeated Distribution, Simultaneous Equation and Trial Error Method.

Repeated Distribution Method

The overhead expenses, according to primary distribution summary are written against the respective departments, one after another. Then the expenses of service departments are redistributed to the production department as well as service department on the basis of agreed percentage. This process is repeated until the figures of the service departments are exhausted or become too small to matter.

Illustration: 2

You are supplied with the following information and required to work out the production hour rate of recovery of overhead in departments A, B, and C.

Particulars	Total	Production Depts.			Service Depts.	
		A	B	C	P	Q
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Rent	12,000	2,400	4,800	2,000	2,000	800
Electricity	4,000	800	2,000	500	400	300
Indirect labor	6,000	1,200	2,000	1,000	800	1,000
Depreciation	5,000	2,500	1,600	200	500	200
Sundries	4,500	910	2,143	847	300	300

Total	31,500	7,810	12,543	4,547	4,000	2,600
Estimated working hours	1000	2,500	1400			

DIRECT DISTRIBUTION

Under this method, the cost of the service department is apportioned directly to the production department only ignoring the services rendered by one service department to the other

ILLUSTRATION: 3

Small company Ltd. has three production department and four services department. The expenses for these department as per primary distribution summary were:

PRODUCTION DEPARTMENT:	RS.	RS.
A	30000	
B	26000	
C	<u>24000</u>	
SERVICE DEPARTMENT:		80000
Stores	4000	
Time keeping and accounts	3000	
Power	1600	
Canteen	<u>1000</u>	9600
TOTAL		<u>89600</u>

The following information is also available in respect of the production department:

	Dept	Dept	Dept
Horse power of machines	600	600	400
Number of workers	40	30	30
Value of stores requestioned	Rs.5000	3000	2000

Apportion the costs of the various service department to the department.

SOLUTION:

SECONDARY DISTRIBUTION SUMMARY

COSTS	BASIS OF APPORTIONMENT	TOTAL RS.	Production dept		
			A RS.	B RS.	C RS.
As per primary distribution summary stores	-------	80,000	30,000	26,000	24,000
	Values of stores requisitioned (5:3:2)	4,000	2,000	1,200	800
Time keeping and accounts canteen power	Number of workers (4:3:3) ----do----	3,000	1,200	900	900
	H.P of machines (3:3:2)	1,000	400	300	300
		1,600	600	600	400
	TOTAL				
		89,600	34,200	29,000	26,400

STEP METHOD:

Under this method, the cost of the serviceable department is first apportioned to other production as well as the services department. Therefore, a sequence of apportionment must be chosen. After apportionment the first service department, the next service department is taken up. Thus, the service department are apportionment off one after another. The department to which apportioning has already been done is not charged again. Hence, the cost of the last services department is apportionment to only production department.

Illustration: 4

A manufacturing company has two production department X and, and three service department time keeping, Stores and maintenance. The department distribution summary showed the following expenses for January.

Production Department

X:	RS. 36000
Y:	RS. 24000

Service Department

Stores:	RS. 7500
Time Keeping:	RS. 6000
Maintenance:	RS. 4500

Other information relating to these department were:

	Production department		service department		
	X	Y	Store	Time keeping	Maintenance
No. of Employees	20	15	10	8	5
NO. of requisition	24	20	---	---	6
Machine-hours	1800	1200	---	---	---

Apportionment the costs of the service department to production department X and Y .

SOLUTION:

DEPARTMENT	PRIMARY DISTRIBUTION SUMMARY RS.			
Time keeping	6000	(-)6000		
Stores	7500	1200	(-)8700	
Maintenance	4500	600	1044	(-)6144

X	36000		2400	4176	3686	46262
Y	24000		1800	3480	2458	31738
	78000				78000

Time keeping-10:5:20:15 (No. of employees)

Stores - 24:20 (No. of requisition)

Maintenance---18:12 (machine hours)

Illustration: 5

From the following information, work out the production hour rate of recovery of overhead in department A, B and C.

ITEMS:	Production department			Service department	
	A	B	C	D	E
	Rs.	Rs.	Rs.	Rs.	Rs.
Rent	200	400	150	150	100
Electricity	50	80	30	20	20
Plant depreciation	1000	1500	1000	300	200
Fire insurance	80	160	60	60	40
Transport	50	50	50	100	150
Estimate working hours	1000	2500	1800		

The expenses of service departments D and E are apportioned as under:

	A	B	C	D	E
D	30%	40%	20%	---	10%
E	10%	20%	50%	20%	

SOLUTION:

		Production department			Service department	
Item	Total Rs.	A Rs.	B Rs.	C Rs.	D Rs.	E Rs.
Rent	1,000	200	400	150	150	100
Electricity	200	50	80	30	20	20
Depreciation	4,000	1,000	1,500	1,000	300	200
F. insurance	400	80	160	60	60	40
Transport	400	50	50	50	100	150
Total	6,000	1,380	1,290	1,290	630	510
Service dept. D apportioned	---	224	299	149	-747	75
Service dept. E apportioned	---	59	117	292	117	-585
Total	6,000	1,380	2,190	1,731	---	---
Working hours		1,000	2,500	1,800		
Hourly rate		1,663	10,424	0.9617		

Let a be the total overhead of service department. let b be the total overhead of service department E.

Thus   a $= 630 + 20\%$ b

b $= 510 + 10\%$ a

$$\text{(or) a} = 610 + 0.2b$$

$$B = 510 + 0.1 \text{ a}$$

Multiply equation (2) by 10

$$10 \text{ b} = 5,100 + a$$

Re – arranging the equation (3) and (1)

$$-a + 10b = 5,100$$

$$a - 0.2 \text{ b} = 630$$

Add equation (4) and (5), we get

$$9.8b = 5,730$$

$$b = 5730/9.8 = 585$$

$$a = 747$$

TRIAL AND ERROR METHOD

In this method, the cost-of-service centre (S_1) is apportioned to another service centre(S_1). Then, the cost of another service centre (S_2) along with the share received from the first service centre is again apportioned to the first service centres. The process is repeated till the amount becomes zero or negligible.

Illustration: 6

In a factory, there are two service departments P and Q three production departments A, B and C. In April, the departmental expenses were:

A   Rs. 6,500,00   P   Rs. 1,20,000

B   Rs. 6,00,000   Q   Rs. 1,00,000

C   Rs. 5,00,00

The service department expenses are allotted on a percentage basis as follows:

Service Department	Production	Departments			Service	Department
		A	B	C	P	Q
P		30%	40%	15%	---	15%
Q		40%	30%	25%	5%	---

Prepare a statement showing the distribution of the two service department expenses to three departments under the "Repeated Distribution Method" and Simultaneous Equation Method.

Solution:

Repeated Distribution Method

	Production Departments			Service Departments	
	A	**B**	**C**	**P**	**Q**
	Rs.	**Rs.**	**Rs.**	**Rs.**	**Rs.**
Expenses	6,50,000	6,00,000	5,00,000	1,20,000	1,00,000
Apportionment of P Expenses	36,000	48,000	18,000	-1,20,000	18,000
Apportionment of Q Expenses	47,200	35,400	29,500	5,900	-1,18,000
Apportionment of P Expenses	1,770	2,360	885	-5,900	885
Apportionment of Q Expenses	354	266	221	44	-885
Apportionment of P Expenses	13	17	7	-44	7
Apportionment of Q Expenses	3	2	2	-	-7

Simultaneous Equation Method

Let X be the total overhead of P department

Let Y be the total overhead of Q department

$X \quad = \quad 1,20,000+0.05Y$

$Y \quad = \quad 1,00,000+0.15X$

$Y \quad = \quad 1,20,000+0.05(1,00,000+0.15X)$

$X \quad = \quad 1,20,000+5,000+0.0075X$

$X-0.075X \quad = \quad 1,25,000$

or $0.09925X = 1,25,000$

or $X=\dfrac{1,25,000}{0.9925}=1,25,945$

$Y \quad =1,00,000+18,892$

$=1,18,892$

Apportionment of Overheads

	Production depts.			Service depts..	
	A	B	C	P	Q
	Rs.	Rs.	Rs.	Rs.	Rs.
Departmental expenses	6,50,000	6,00,000	5,00,000	1,20,000	1,00,000
Apportioned of P Dept.	37,783	50,378	18,892	-1,25,945	18.982
Apportioned of Q Dept.	47,557	35,667	29,723	5,945	-1,18,892
	7,35,340	6,86,045	5,48,615	--	--

Illustration: 7

The following data were obtained from the books of Light Engineering Company for the half year ended 30th September. Calculate the departmental overhead rates for each of the

production departments, assuming that the overheads are recovered as a percentage of direct wages:

		Production depts.			Service depts..	
		A	**B**	**C**	**X**	**Y**
Direct wages	**Rs.**	7,000	6,000	5,000	1,000	1,000
Direct materials	**Rs.**	3,000	2,500	2,500	1,500	1,000
Employees	**Nos.**	200	150	150	50	50
Electricity	**Kwh.**	8,000	6,000	6,000	3,000	3,000
Light points	**Nos.**	10	15	15	5	5
Assets value ('000)	**Rs.**	50	30	20	10	10
Area occupied	**(sq.yd.)**	800	600	600	200	100

The expenses for 6 months were:

Stores overhead	Rs.400	Depreciation	6,000
Motive power	1,500	Repairs & maintenance	1,200
Electric lighting	200	General overheads	10,000
Labour welfare	3,000	Rent and taxes	600

Apportion the expenses of department X in the ratio of 4:4:3 and that of department Y in proportion to direct wages, to department A, B and C respectively.

Solution:

Light Engineering Company overhead Distribution summary

Period: Half year ended 30th Sept.

Particulars of Overheads	Bases	Production Departments				Service Department	+
		Total Rs.	A Rs.	B Rs.	C Rs.	X Rs.	Y Rs.
Wages	Direct (as given)	2,000				1,000	1,000
Materials	Direct (as given)	2,500				1,500	1,000
Stores Overhead	Materials consumed	400	120	100	80	60	40
Motive Power	K.W.H	1,500	480	360	360	120	180
Lighting	No. of points	200	40	60	60	20	20
Labour welfare	No. of employee	3,000	1,000	750	750	250	250
Depreciation	Assets value	6,000	2,500	1,500	1,000	500	500
Repairs and Maintenance	Assets value	1,200	500	300	200	100	100
General Over-head	Wages paid	10,000	3,500	3,000	2,500	500	500
Rent & Taxes	Area occupied	600	200	150	150	50	50
	Total	27,400	8,340	6,220	5,100	4,100	3,640
Apportionment of Service Depts. Department X 4:3:3 (as given)			1,640	1,230	1,230	-4,100	
Department Y direct Wages 7:6:5			1,416	1,213	1,011	--	-3640
Total		27,400	11,396	8,663	7,341	--	---

Direct   7000   6000   5,000

Percentage of

Overheads to Direct Wages A$=\dfrac{11,396\times100}{7,000}=162.8\%$

$B=\dfrac{8,663\times100}{6,000}=144.4\%$

$C=\dfrac{17,341\times100}{5,000}=146.8\%$

ILLUSTRATION: 8

A company has three production departments A, B and C two service departments X and Y. The expenses incurred by them during the month are:

A Rs. 80,000   X Rs. 23,400

B Rs. 70,000   Y Rs. 30,000

C Rs. 50,000

The expenses of service departments to the production departments of the following basis:

	A	B	C X	Y
Expenses of X 20%	40%	30%	----	10%
Expenses of Y 40%	20%	20%	20%	

Show clearly as to how the expenses of X and Y departments would be apportioned to the A, B and C departments.   (B.Com., Madurai)

Solution:

Secondary Distribution Summary

	Production Departments			Service Departments	
	A	B	C	X	Y
	Rs.	Rs.	Rs.	Rs.	Rs.
Total expenses	80,000	70,000	50,000	23,400	30,000
Service department X	4,680	9,360	7,020	-23,400	2,340
Service department Y	12,936	6,468	6,468	6,468	-32,340
Service department X	1,294	2,587	1,940	-6,468	647
Service department Y	259	129	129	130	-647
Service department X	26	52	39	-130	13

Service department Y	5	3	2	3	-13
Service department X	1	1	1	-3	-
Total	**99,201**	**88,600**	**65,599**	**-**	**-**

Alternatively:

Let $\quad$ x = Total overheads of department X

$\quad$ v = Total overheads of department Y

$\quad$ x = 23,400 + 0.2y

$\quad$ y = 30,000 + 0.1x

Multiplying equation 1 by 5 we get

$$5x = 1,17,000 + y$$

$\quad$ Adding (3) and (2)

$$4.9x = 1,47,000$$

Overheads Analysis, Classification and Accounting

$$x = \frac{1,47,000}{4.9} = 30,000$$

By substituting equation (1)

$$30,000 = 23,400 + 0.2y$$

$$6,600 = 0.2y$$

$$y = \frac{6,600}{0.2} = 33,000$$

	Production Departments			Service Departments	
	A	**B**	**C**	**X**	**Y**
	Rs.	Rs.	Rs.	Rs.	Rs.
Total Expenses (as per summary) Expenses of Service Department X is Rs. 30,000	80,000	70,000	50,000	23,400	30,000
Expenses of Service Department Y is Rs.33,000	6,000	12,000	9,000	-30,000	3,000
	13,200	6,600	6,600	6,600	-33,000
Total	99,200	88,600	65,600	-	-

Verification:

$$x = 23,400 + 0.2y \qquad y = 30,000 + 0.1x$$

$$30,000 = 23,400 + 0.2(33,000) \quad 33,000 = 30,000 + 0.1(30,000)$$

$$= 23,400 + 6,000 \qquad = 30,000 + 3,000$$

Alternatively (Trial and Error Method):

	Service departments	
	X	Y
As per summary	23,400	30,000
Transfer to Y (10% of 23,400)	---	2,340
Transfer to X (20% of 32,430)	6,468	---
Transfer to Y (10% of 6,468)	---	647
Transfer to X (20% of 647)	129	---
Transfer to Y (10% of 129)	---	13
Transfer to X (20% of 13)	3	---
Transfer to Y (10% of 13)	----	---
Total of positive figures	30,000	33,000

Illustration: 9

A company has three production departments A, B and C two service departments X and Y. The following information is available regarding various expenses:

Rs.

Power	2,400	Fire precaution service
Rent	4,200	Insurance assets
Canteen	3,000	Depreciation (10% of capital value)
Personal dept.	3,000	
Time office	1,000	
Maintenance		

of buildings   2,400

We also have the following data:

	Production Departments		Service department		
	A Rs.	B Rs,	C Rs.	X Rs.	Y Rs.
Area (sq. metres)	400	400	300	200	100
K.W. hours	2,000	2,200	800	750	250
No. of. Workers	90	120	30	40	20
Capital Value Assets ('00,000) Re.	0.50	0.60	0.40	0.30	0.20

The services of X and Y departments are used by the other departments in the following proportion:

	A	B	C	X	Y
X	25%	30%	25%	---	20%
Y	40%	20%	30%	10%	-----

Calculate the total overheads of production departments after reapportioning service department overheads.

Solution:

DEPARTMENTAL OVERHEAD DISTRIBUTION SUMMARY

Expenses	Basis	Total Expenses Rs.	A Rs.	B Rs.	C Rs.	X Rs.	Y Rs.
Power	K.W. hours 20:22:8:7:5:2.5	2,400	800	880	320	300	100
Rent	Area	4,200	1,200	1,200	300	400	200

		4:4:3:2:1						
Canteen	No. of workers 9:12:3:4:2	3,000	900	1,200	300	400	200
Personal Dept. Time office	No. of. workers 9:12:3:4:2	3,000	900	1,200	300	400	200
Maintenance	Capital Value 5:6:4:3:2	2,400	600	720	480	360	240
Fire Precaution	Value of assets 5:6:4:3:2	1,200	300	360	240	180	120
Insurance on assets	Value of assets 5:6:4:3:2	1000	250	300	200	150	100
Depreciation	Value of assets 5:6:4:3:2	20,000	5,000	6,000	4,000	3,000	2,000
Total		38,200	10,250	12,260	6,840	5,523	3,327

Illustration: 10

How would you apportion the following expenses between departments A and B?

Rent and Rates	Rs.360	Insurance	Rs. 130
Stores expenses	Rs. 742	Fire Insurance	Rs.260
General Factory labor	Rs. 1,284	Depreciation	Rs. 960
Holiday pay	Rs. 520	Plant Repairs	Rs. 450

Information regarding the departments available:

	A	**B**
Floor space	60' x 115'	45' x 100'
Number of employees	18	42
Annual direct wages	Rs. 5,000	Rs. 6,000
Annual direct labor hours	36,000	92,500
Plant value	Rs. 10,000	Rs.2,000

Solution:

Statement of Overhead Apportionment

Expenses	Basis	Departments A	Departments B	Total
		Rs.	Rs.	Rs.
Rent and Rates	Floor Area	218	142	360
Insurance	Plant Value	104	26	130
Stores Expenses	Labor Hours	208	534	742
Fire Insurance	Plant value	208	52	260
General Factory labor	Labor Hours	359	925	1,284
Depreciation	Plant Value	725	181	906
Holiday Pay	Direct Wages	236	284	530
Plant Repairs	Plant Value	360	90	450
Total:		**2,418**	**2,234**	**4,652**

UNIT: 5 TECHNIQUES OF COSTING

UNIT COSTING, JOB BATCH COSTING, CONTRACT COSTING, PROCESS COSTING -EXCLUDING INTER PROCESS PROFIT.

JOB, BATCH AND CONTRACT COSTING

Job Costing is "that form of specific order costing which applies where work is undertaken to customer's special requirements. As distinct from contract costing, each job is of comparatively short duration'.

MAIN FEATURES OF JOB COSTING

1.Production is performed against customers order and specification.

2.The cost of each job is ascertained. Each job has its own characteristics so different degrees of attention and skill are required for different jobs.

3. Each job is different from others.

TYPES OF JOB ORDER COSTING

Job order costing can be sub-divided into

(a) factory job costing or job costing
(b) contract costing.

In batch costing also this method of costing is used, when batches of Similar product are produced.

FACTORY JOB COSTING OR JOB COSTING

In this case the size of the job is small or of shorter duration when compared to the contract.

ADVANTAGES

1. It helps to know or distinguish the profitable from unprofitable jobs.
2. It helps in preparation of estimates while sending quotations for similar jobs.
3. It helps in future production planning
4. This method facilitates in the cost-plus contracts
5. Cost data under job costing help in preparing budgets for future.

DISADVANTAGES

1. It involves more clerical work. As such, it is expensive laborious.
2. It is historical costing in nature and embraces all defects of historical costing. As such, it does not give prompt remedial actions. Unless it is used with standard costing system.
3. Costing of minute jobs may lead to inaccurate result.

JOB COSTING PROCEDURE

1. For each job, the cost involved is estimated. Price is quoted to the customer on the basis of this estimated cost. Which is given below. All the pieces of information regarding production or contained in it.

Production order

Serial No. ……   Description of job. ….

Name of Customer……...   Quantity ordered…….

Customer's reference no…….   Machine Nos…….

Code No…….   Operation Nos….

                                            Bill of materials

Date of Starting……   Date of finishing……

Clock Time	Operation No.	Dept. No.	Operation No. Detail	Quantity Produced	Rejected

Ordered by…….

Checked by…….   Approved by…...

2. As soon as an order is received, the production control department assigns a production order number to it. Sometimes, sub numbers are allotted in addition to one master order number if the work is subdivided.

3. profit or loss on each job can be determined by comparing the actual cost with the price obtained.

Illustration 1

The information given below has been taken from the cost records of an engineering works in respect of the job no.303

Material Rs.4,010.

Wages: department A - 60 hours @ Rs.3 per hour

Department B - 40 hours @ Rs.2 per hour

Department C - 20 hours @ Rs.5 per hour

The overhead expenses are as follows.

Variable: department A - Rs.5000 for 5000 hours

Department B - Rs.3000 for 1500 hours.

Department C - Rs.2000 for 500 hours.

Fixed expenses Rs. 20,000 for 10,000 working hours

Calculate the cost of the job No.303 and the price for the job to give a profit of 25 per cent on the selling price

Solution:

Job Cost Sheet (Job No. 303)

	Rs		Rs
Materials			
Wages: Dept. A (60 X RS. 3)	180		4010
Dept. B (40 X RS. 2)	80		
Dept. C (20 X RS. 5)	100		360
Overhead expenses:			
Variable: Dep. A@ $\frac{5000}{5000}$=Rs.1x60 = 60			220
Dep. B@ $\frac{5000}{5000}$=Rs.1x40 = 80			240
Dep. C@ $\frac{5000}{5000}$=Rs.4x20 = 80			4830
Fixed expenses:			
$\frac{20000}{10000}$=Rs. 2 x (60+40+20)			1610
Cost of the Job			
Add: Profit 25% on selling price			6440
Selling Price			

BATCH COSTING

➢ Batch costing is a type of job costing. Costing is done when production consists of a definite number of articles or production involves limited repetition work.

➢ A batch is the unit of cost in batch costing. It's costing procedure is the same as that of job costing. Each similar batch is given a batch order number.

Determination of Economic Batch Quantity (E.B.Q)

➢ Determination of economic batch size or lot size is the most important work in batch costing. To determine the economic batch quantity, costs may be grouped into setting up costs and carrying costs.

➢ Economic batch quantity is determined at the point where carrying costs are equal to setting up costs. In this point the total costs is also minimum. It can be determined with the help of a table graph or mathematical formula.

➢ Determination of E.B.Q. requires information like (1) setting up costs per batch (2) cost of production (3) cost of storage (4) rate of annual requirement of articles (5) rate of interest on the capital invested in parts or products.

A simple and most commonly used formula for determining the

$$\text{E.B.Q.}= \sqrt{\frac{2DS}{IC}}$$

D= annual demand for the product

S= setting up cost per batch

I= annual rate of interest

C = Unit cost of production

Illustration 2

Compute the economic batch quantity for a company using batch costing with the flowing information:

Annual demand for the parts:	4,000 units
Setting up cost	Rs.100
Cost of manufacture; One-unit	Rs. 200
Rate of interest per annum	10%

Solution:

$$= \sqrt{\frac{2*\text{Annual demand}*\text{set up cost}}{\text{Interst rate p.a}*\text{unit cost of production}}}$$

$$= \sqrt{\frac{2*4000*100}{0.10*200}}$$

$$= \sqrt{40000}$$

=   200 Units

CONTRACT COSTING

Contract costing is a type of job costing in which a contract constitutes a unit of cost. For example, builders civil engineering firms, constructional and mechanical engineering firms etc. adopt the method of costing also known as terminal costing.

Contract costing is less detailed and simpler than job costing. In brief the point are;

1. Contract take a longer time for completion
2. The work is executed at customer site
3. General a portion of the contract is given to a sub-contractor, when it is of a special character; for example, floor polishing, coloring etc.
4. Since the contracts take a number of years to complete, the problem of taking the profits arises.
5. Since each contract is distinct from others all expenses of a particular contract are directly debited to it. However indirect expenses common expenses of central office salary for supervisory staff etc., engaged on two or more contracts, are apportioned to all contracts as a percentage of materials or labour.

Escalation Clause:

It is a clause in the agreement of a contract, which provides to compensate the contractor to accommodate the price variance in the cost of materials or labour, because of the market fluctuations. This clause is included in the case of long period contracts. It safeguards the contractor against unfavourable changes in prices of materials and labour.

Cost plus contract:

Certain contracts are such that their cost cannot be estimated in advance. The profit is in the form of a fixed amount or of a percentage on actual cost. Cost plus contract is advantageous to both the contractor and the contracts This type of contact is undertaken for the production of special articles, not usually manufactured; for example, in case of urgent repairs of ships, vehicles, power-house etc.

Illustration: 3

How much of profit, if any, would you allow to be considered in the following case?

	Rs.
Contract cost	2,80,000 up-to date
Contract value	5,00,000
Cash Received	2,70,000
Uncertified work	30,000
Deduction from bills by way of security	10%

Solution:

Cost of work certified = (cost of the contract) – (Uncertified work)

$$= Rs.2,80,000-Rs.\ 30,000= Rs.2,50,000$$

Cash received is Rs.2,70,000 represents 90% of the work certified: so, the work certified

$$2,70,000 \times 100/90 = Rs.\ 3,00,000$$

Thus, National profit = 3,00,000- 2,50,000= Rs.50,000

Profit to be credited to

Profit & loss account $=50,000 \times 2 \times 90/3 \times 100$

$$=Rs.30,000.$$

Work-in progress:

Incomplete contracts are referred to as work-in -progress includes certified work and uncertified portion of work. Work-in-progress account is debited with the certified work and uncertified work; and with these sums contract account is certified. The work-in-progress account is also credited with balance of the National profit not taken to the Profit and Loss Account. At this stage, the entire profit of the work is transferred to Profit and Loss Account by closing contract Account.

This account shows debit balance which is taken to the balance sheet on the asset side. The contract's account which shows credit balance on account of cash received in advance, is not shows on the liability side of the balance sheet but is shows as a deduction from the work-in-progress account on the asset side of the balance sheet.

When less than 1/3 of the work is completed, the net expenditure incurred up to date is taken to be the value of work-in- progress. Net expenditure means gross expenditure minus value of material, plant etc. in the hand at the end of the year.

Balance sheet as on…

Asset Side	Rs.	Rs.
Work-in-progress:		
Value of work certified	………….	
Cost of work uncertified	………….	
	………….	
Less: Reserve for unrealised profit	………….	
		………….
Less: amount received from contracts	………….	

ILLUSTRATION :4

Show how you would deal with plant in contract account with the following information.

Plant issued to contract on 1ˢᵗ March, costing Rs. 1,00,000. Plant costing Rs.5,000 was transferred to 'A' contract on 30ᵗʰ August. Plant costing Rs.4,000 was stolen and another costing Rs. 3,000 was destroyed by fire. The plant was insured against fire to the full value plant costing Rs. 5,000 was sold for Rs. 4,000. Plant at the end of December was valued by charging depreciation @ 10% p.a. on 31ˢᵗ December.

Solution:

Contract Account

		Rs.				Rs.
Mar. 1	To Plant	1,00,000	Aug. 30	By 'A' Contract A/C (Transferred) Plant	Rs.5,000	
				Less: Depreciation @ 10% for 6 months	250	4,750
				By Profit & Loss A/C		4,000
				(Plant stolen)		3,000
				By Insurance Company		
				(Plant Destroyed)		4,000
				By Plant Sold		1,000
				By Profit & Loss A/C (Loss on sale) (Rs. 5,000 – Rs. 4,000)		
				By Balance c/d Plant	83,000	
				Less: Depreciation @ 10% for 10 months	6,917	76,083

PROCESS COSTING:

JOB COSTING VS PROCESS COSTING

Job costing	process costing
➤ Cost are found out at the end of the cost period	➤ Cost are found out at the state of completion of the job
➤ Cost are transferred from one process to another process	➤ cost are not transferred unless there is a surplus production.
➤ Paper work is less	➤ Since every job is costed separately there is more work

➤ Cost are accumulated for each process for a period.	➤ Costs are accumulated for each job.

Advantages of process costing:

- It involves less clerical work because of the simplicity of cost records.
- The average costs of homogeneous products can easily be computed.
- It enables the correct valuation of costing inventories.

Disadvantages of process costing:

- The system of costing conceals weakness and inefficiencies in processing.
- It doesn't evaluate the effort of individual workers or supervisor.
- The valuation of work in progress on the basis of degree of completion is merely a guess work.

Illustration: 5

From the figure show the cost of the three processes of manufacture. The production of each process is passed on to the next process immediately on completion.

	Rs	Rs	Rs
Wages and materials	30400	12000	29250
Works overhead	5600	5250	6000
Production in units	36000	37500	48000
Stock (units from preceding process) 1st July	-----	4000	16500
Stock (units from preceding process) 31st July	------	1000	5500

Solution

Process A

	Unit	Rs.		Unit	Rs.
Wage and Materials	36,000	30,400	By Production @ rs1/- per unit transferred to process B		
Works overhead	5,600	5,600		36,000	36,000
	36,000	36,000		36,000	36,000
	Unit	Rs.		Unit	Rs.
Wage and Materials	4,000	4,000	/By Wastage @ rs1.50/-per unit transferred to process C		
Works overhead	36,000	36,000		36,000	36.000
			Closing Stock	1,000	1.000
	40,000	57,250		40,000	57250

Process C

	Unit	Rs.		Unit	Rs.
To opening stock	16,500	24,750	By Wastage	500	
process B		56,250		5,500	8,250
production		29,250	Closing stock	48,000	1,08,000
Process Costing		6,000	production@ rs 2.25 per unit		
Materials works overhead					
	54,000	1,16,250		54000	116250

LOSSES AND GAINS IN PROCESS

When materials are processed, they lose or gain in volume or weight as a result of the process. It is common that process loss or scrap or wastage occur in process industries. These process losses may be of two type, viz. controllable and uncontrollable.

a) NORMAL OR UNCONTROLLABLE LOSS

Because of the nature of the raw materials, some loss in inherent and is unavoidable. This is known as normal wastage or normal loss. And this type of loss is expected in normal condition (for example, sampling process evaporation etc.) The percentage of such loss a anticipate from past experience by the management. loss of this type should be absolute by good unit produced, i.e., the cost of units lost is charged to the good units-output. Any value realisable on the normal loss will be credited to the process account.

Illustration 6 (Normal loss without scrap value)

The cost of product of 40 units consisting of materials Rs.1,500: Labour Rs.1,300 and overhead Rs,164. The normal waste is 5% of input. Show the process account.

Solution

Process Account

	Units	Amount		Units	Amount
		Rs.			Rs.
To Materials	40	1,500	By Normal Loss	2	-
			By Final		
To Labours	-	1,300	Product@Rs.78	38	2,964
To Overheads	-	164			
	40	2,964		40	2,964

Per unit Rate=Rs.2,964 / (40-20) =Rs.78

(or)Rs.78x38=Rs.2,964

B) ABNORMAL LOSS

In certain cases, it can be seen that the loss exceeds the predetermined normal loss. Any loss exceeding the normal loss is called abnormal loss. Abnormal loss should not affect the normal cost of production. It is caused by accidents, sub-standard materials, carelessness etc. Therefore, abnormal loss is valued just like good units and transferred to a separate account called Abnormal loss account.

Value of Abnormal Loss=Normal cost of normal production\Normal output x Units of abnormal loss.

The loss on account of abnormal loss or wastage is not borne by production. but by profit and loss account. Abnormal wastage account is debited and process account is credited with the cost of abnormal wastage. If the wastage is sold in the market, Abnormal wastage account is credited with the realised price and the balance is transferred to profit and loss account.

Illustration 7(Normal loss and abnormal loss with no scrap value)

Prepare process account from the following:

Materials issued 1,000kg .@Rs.125

Wages Rs.28,000

Overheads Rs.8,000

Normal loss 5% of input

Output 900 kgs.

Solution

Process Account

	Units	Amount		Units	Amount
		Rs			Rs.
To Materials	1,000	1,25,000	By Normal loss	50	-
To Wages	-	28,000	By Abnormal Wastage	50	8,474
To Overheads	-	8,000	By Next process @ Rs.169.47	900	1,52,526
	1,000	1,61,000		1,000	1,61,000

(Or 1,61,000 / 950 x900=1,52,526)

C) ABNORMAL GAINS OR EFFECTIVENESS

The normal wastage is an estimate only. The actual loss or wastage may be more or the determined percentage of normal loss. If the actual wastage is more than the normal loss, it is known as abnormal wastage: but if the actual wastage is less than the normal wastage. normal loss or wastage is shown on credit side of the process account and abnormal loss is shown on the debit side of the process account.

Illustration 8 (Normal loss and abnormal gain)

Product A is obtained after it passes through three distinct processes 2,000 kgs. Of material Rs.5 per kg. were issues to the process I. Direct wages amounted to Rs.900 production overhead incurred was Rs. 500.Normal loss is estimated at 10% of input. The wastage is sold at Rs. 3per kg. The actual output is 1,850 kgs.

Prepare process I account and the abnormal gain or abnormal loss account as the may be.

Solution

Process Account

	Units	Amount		Units	Amount
		Rs.			Rs.
To Material	2,000	10,000	By Normal loss A/c	200	600
To Wages	-	900	By Process II A/c@Rs.6	1,850	11,100
To Abnormal Gain /Ac	-	500			
	50	300			
	2,050	11,700		2,050	11,700

Normal Wastage (loss)Account

	Units	Amount		Units	Amount
		Rs.			Rs.
To Process	200	600	By cash(sale) (200-50)	150	450
			By Abnormal gain A/c	50	150
	200	600		200	600

Abnormal Gain Account

	Units	Amount		Units	Amount
		Rs.			Rs.
To Normal Wastage Account	50	150	By Process I a/c	50	300
To Profit &loss					
	-	150			
	50	300		50	300

D) Scrap

Scrap is defined as the incidental residue from certain types of manufacture, usually of small amount and of low value, recoverable without further processing. It is another form of waste. Excessive amount of scrap shoes inefficiency. scrap is credited to the process account. For example, scrap may be in the form of turning of materials, borings, trimmings etc.

E) Defective

Finished products that are not up to the aimed standard, are known as defectives. Spoilage cannot be repaired, but defectives can be repaired by additional labour and materials into effective units. If defectives are sold as seconds the amount received is credited to the concerned process account. If the defectives are reprocessed into good units, the extra amount of materials and labour will be treated as factory overheads. If the defectives cannot be identified, the normal cost is charged to factory overheads and abnormal cost will be transferred to costing profit and loss account.

Illustration 9

A product passes through two distinct processes, A and B and thereafter to finished stock. From the following information, you are required to prepare process cost accounts.

	Process A	Process B
Material consumed	Rs.12,000	Rs.6,000
Direct labours	Rs.14,000	Rs.8,000
Manufacturing expenses	Rs.4,000	Rs.4,000
Input in process A (units)	Rs.10,000	-
-Do- (value)	Rs.10,000	
Output (units)	Rs.9,400	units8,300
Normal wastage	5%	10%
Value of normal wastage	Rs.8	Rs.10

(per 100 units)

Solution

Process A Account

	Units	Amount		Units	Amount
		Rs.			Rs.
To input	10,000	10,000	By normal wastage	500	40
Material consumed		12,000	Abnormal Wastage	100	421*
Direct labour		14,000	Transfer to process B A/c		
Manufacturing Expenses		4,000	@Rs.4.206		
				9,400	39,539
	10,000	40,000		10,000	40,000

Rs.40,000-Rs.40=39,960 / 9,500 x100=Rs.420.6=Rs.421.00

Process B Account

	Units	Amount		Units	Amount
		Rs.			Rs.
To process A A\c	9,400	39,539	By normal wastage	940	94
Material consumed					
Direct labour		6,000	Abnormal wastage	160	1,087
Manufacturing expenses		8,000	Finished stock		
		4,000	A/c@Rs.6.80	8,300	56,358
	9,400	57,539		9,400	57,539

INTER-PROCEES PROFIT

Sometime in certain industries, the output of one process is transferred to the next process at market price or cost plus a percentage of profit. This is in order to assess the efficiency of each process. Each process makes a profit. The different between the cost and the transfer price is known as inter-process profit. Thus, the last process is not unnecessarily inflated with profits.

ILLUSTRATION:10

A Product passes through two processes X and Y. The output of process X is charged to process Y at a price which includes a profit of 20% at actual cost and the output of process Y is charged to finihed stock at a price which includes a profit of 10% on actual cost. The following data are available for the month of **JULY 2010.**

	Process X	Process Y
	Rs.	Rs.
Materials (2,500 units)	1250	1250
Labour	625	500
Overheads	1875	750

There was no partly finished work in either process. Out of the finished stock 1,500 units had been sold for Rs.7,500.

Prepare the Process Accounts and the Finished Stock Account

Solution:

Particulars	Units	Amount	Particulars	Units	Amount
		Rs.			Rs.
To Materials	2,500	1,250	By Process Y	2,500	4,500
To Labour		625	(Cost plus 20%		
To Overheads		1,875	Profit)		

		750			
To P and L a/c					
	2,500	4,500		2,500	4,500

Process Y Account

Particulars	Units	Amount	Particulars	Units	Amount
		Rs.			Rs.
To Process Y A/c	2,500	7,700	By Cost of sales	1,500	4,620
			By Closing Stock		
				1000	3,080
	2,500	7,700		2,500	7,700

Particulars	Units	Amount Rs.	Particulars	Units	Amount Rs.
To Process X A/c	2,500	4,500	By Finished	2,500	7,700
To Materials		1,250	Stock A/c		
To Labour		500			
To Overheads		750			
To P and L A/c		700			
	2,500	7,700		2,500	7,700

Finished Stock Account

This Shows the value of finished stock as Rs.3,080. It includes 10% profit.

Now the provision for unrealized profit is to be made. This will be made. This will be calculated as follows:

$$\text{Cost of Stock} = \frac{100}{110}$$

110

Unrealised profit = 3,080 – 2,800 = 280

Trading and Profit and Loss Accounts

Particulars	Amount	Particulars	Amount
	Rs.		Rs.
The Cost of sales	4,620	By Sales	7,500
To Gross profit	2,880		
	7,500		7,500
To Provision for		By Gross profit	2,880
Realized profit	280	BY Process X	
		A/c	750
Net profit	4,050	By Process Y	
		A/c	700
	4,330		4,330

EQUIVALENT PRODUCTION

The average cost per unit is determined in progressing type of industries, by dividing the total cost incurred by the total units produced during the period. But when the process is continuous, there is always incomplete work in the opening and closing periods of each process. In such cases, if unit cost is arrived at on the basis of total process cost and units produced, ignoring incomplete units will not represent the correct cost. The Wheldon defines the equivalent production as "the production of a process in term of completed units ". This is done on the basis of an estimate or a percentage of degree of completion in respect of materials consumed, machine-hours etc. in certain cases, it is on the basis of past experience. For example, 200 units, 50% complete, then equivalent product is 200 x 50% = 100 units.

PROCEDURE OF COMPUTATION

a) Find out equivalent production after taking the percentage of degree of completion in respect of opening stock of work-in-progress.

b) To (a) add the units introduced deducting the closing work-in-progress

c) Convert the equivalent production of closing work-in-progress and add to the above.

d) Find out the net process costs, element wise i.e., materials, labour, overheads.

e) Find out the cost per unit of equivalent production for each element of cost separately.

f) Find out the value of output of finished and transferred products and the work-in-progress.

The above steps invite the preparation of three statements:

1) Statement of equivalent production.
2) Statement of cost.
3) Statement of evaluation.

Illustration 11

Opening stock of work-in-progress 4,000 units 40%complete.

Units put into process: 30,000

Units completed: 32,000

Closing stock of work-in-progress 2,000 units 60% complete.

Calculate equivalent production.

Solution: Rs.

Opening stock-work required to be completed   2,400

                    (4,000 X 60%)

Add: units introduced and completed during the   28,000

                    Period (30,000 – 2,000)

Add: closing stock (work done i.e., 60%)   1,200

(2,000 X 60%)	_____	
Completed equivalent production	31,600	
	=====	

Alternatively: Rs.

Units completed during the year	32,000	
Add: closing stock (work done i.e., 60%)	1,200	
(2,000 X 60%)	_____	
		33,200
Less: opening work-in-progress (percentage of	1,600	
Work done in previous period) 4,000 X 40	_____	
Complete equivalent production		31,600
		======

Alternatively: Rs.

Opening stock of work incomplete 4,000X60%		2,400
Add: put into production		30,000
		_____
Less: closing work-in-progress incomplete		32,400
(2,000 X 40 %)		800
		_____
Completed equivalent production		31,600
		======

PROBLEM OF OPENING STOCK OF WORK-IN-PROGRESS

Since costs tend to vary from time to time, each lot may carry different unit costs. The procedure of the calculating equivalent for opening work-in-progress units standard costing is not used, a method of costing can be selected from the following methods:

- First-in-first-out (FIFO) method
- Average cost method

First-in-first-out method

The opening stock of a particular year inherits the incomplete units included in the closing stock of the year. So, this method is called FIFO method. Thus, the cost of units completed in a period is ascertained in parts i) opening work-in-process completed and ii) units introduced and completed during the concerned period.

Equivalent production} = (units in opening WIP) X} percentage of work needed to finish the units.

Average cost method

Under this method we do not start with the assumption that the units of the opening work-in-process will be completed first and thereafter being worked out as is done the other units will be taken up for being worked out as is done under FIFO method.

The following illustration explains both the methods.

Illustration 12

Production data of process A for month of January is given below: Rs.

Units started in production   60,000

Opening inventory   5,000(70% complete)

Closing inventory   7,500(60% complete)

Calculate the equivalent units (i) FIFO (ii) Average method.

FIFO Method

Units started in production	60,000
Add: work done on opening WIP	1,500
(5000 X 30%)	_____
	61,500

Less: Incomplete on ending WIP	3,000	
(7,500 x 40%)	_____	
Equivalent units		58,500
		======

Average method

Units completed	57,500
(60,000 + 5,000 – 7,500)	
Add: Equivalent units of	4,500
Closing WIP (7,500 x 60%)	-----------
	62,000
	======

****