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Entire Document

COST ACCOUNTING

SYLLABI-BOOK MAPPING TABLE

Advanced Cost Accounting BLOCK 1: COST ACCOUNTING AND COST CONTROL

UNIT – I: Cost Accounting Principles: Meaning of cost and cost accounting – Objectives of cost accounting – Installation of a costing system. UNIT – II: Elements of cost – Cost concepts – Cost classifications – Methods, systems and techniques of costing – Cost sheet. UNIT – III: Cost Accounting for material cost control – Need for material cost control – Purchase control – Stores control – Stock levels – EOQ analysis. UNIT – IV: Pricing of stores issues – Perpetual inventory control – ABC analysis – VED analysis – Treatment of waste, scrap, defectives and spoilage. UNIT – V: Labour Cost Control – Time keeping and time booking – Treatment of idle time and overtime cost – Wage rates for costing – Systems of wage payment – Time wage and piece rate – Incentive schemes of wage payment – Labour turnover. UNIT – VI: Overhead Cost Control – Classification of overheads – Allocation and appointment – Absorption of overheads – Different methods – Treatment of under absorption and over absorption of overheads. BLOCK 2: TYPES OF COSTING UNIT – VII: Methods of Costing – Job costing – Contract costing – Profit on incomplete contracts – Cost plus contracts – Target costing – Escalation clause. UNIT – VIII: Unit costing – Meaning – Cost accumulation – Procedure in unit costing – Preparation of cost sheet. UNIT – IX: Process Costing – Features – Job costing Vs Process costing – Process cost accounts – Inter-process profits – Accounting for joint products and by products. BLOCK 3: BILL MARKET UNIT – X: Contract costing – Types – Procedure for contract costing – Contract plus costing – Profit from incomplete contract. UNIT – XI: Operating Costing – Meaning – Features – Objectives – Cost Unit – Transport costing – Operating cost sheet. UNIT – XII: Batch costing – Definition – Economic batch quantity – Applicability of batch costing. UNIT - XIII: Standard Costing – Definition – Advantages and limitations of standard costing – Variance analysis. BLOCK 4: RECONCILIATION OF COST AND FINAL ACCOUNT UNIT – XIV: Reconciliation of cost and final accounts – Cost control and cost reduction – Meaning – Tools and techniques – Essentials for success of cost control and cost reduction – Distinction between cost control and cost reduction – Areas of cost reduction and control – Advantages. Unit 1: Cost Accounting Principles (Pages 1-10) Unit 2: Cost Concepts (Pages 11-29) Unit 3: Cost Accounting for Material Cost Control (Pages 30-54) Unit 4: Techniques of Inventory Control (Pages 55-78) Unit 5: Labour Cost Control (Pages 79-111) Unit 6: Overhead Cost Control (Pages 112-151) Unit 7: Methods of Costing: Job Costing (Pages 152-161) Unit 8: Unit Costing (Pages 162-174) Unit 9: Process Costing (Pages 175-204) Unit 10: Contract Costing: Types and Procedure (Pages 205-217) Unit 11: Operating Costing (Pages 218-227) Unit 12: Batch Costing (Pages 228-234) Unit 13:

Standard Costing (Pages 235-266) Unit 14: Reconciliation of Accounts, Cost Control and Reduction (Pages 267-280)
BLOCK 1: COST ACCOUNTING AND COST CONTROL UNIT 1 COST ACCOUNTING PRINCIPLES 1-10 1.0 Introduction 1.1 Objectives 1.2 Meaning and Objectives of Costing and Cost Accounting 1.2.1 Meaning of Cost 1.3 Installation of a Costing System 1.4 Answers to Check Your Progress Questions 1.5 Summary 1.6 Key Words 1.7 Self Assessment Questions and Exercises 1.8 Further Readings UNIT 2 COST CONCEPTS 11-29 2.0 Introduction 2.1 Objectives 2.2 Elements of Cost 2.2.1 Cost Sheet (Cost Statement) 2.3 Methods and Systems of Costing 2.3.1 Techniques of Costing 2.3.2 Classifications of Cost 2.4 Answers to Check Your Progress Questions 2.5 Summary 2.6 Key Words 2.7 Self Assessment Questions and Exercises 2.8 Further Readings UNIT 3 COST ACCOUNTING FOR MATERIAL COST CONTROL 30-54 3.0 Introduction 3.1 Objectives 3.2 Need for Material Cost Control 3.3 Techniques of Inventory Control 3.3.1 Stock Levels 3.3.2 Economic Order Quantity or EOQ (Reorder Quantity) 3.3.3 Purchase Control 3.3.4 Stores Control 3.4 Answers to Check Your Progress Questions 3.5 Summary 3.6 Key Words 3.7 Self Assessment Questions and Exercises 3.8 Further Readings CONTENTS UNIT 4 TECHNIQUES OF INVENTORY CONTROL 55-78 4.0 Introduction 4.1 Objectives 4.2 Inventory Systems 4.3 Pricing Material Issues or Stores Issues 4.4 Treatment of Waste, Scrap, Defectives and Spoilage 4.5 ABC and VED Analysis 4.6 Answers to Check Your Progress Questions 4.7 Summary 4.8 Key Words 4.9 Self Assessment Questions and Exercises 4.10 Further Readings UNIT 5 LABOUR COST CONTROL 79-111 5.0 Introduction 5.1 Objectives 5.2 Labour Turnover 5.3 Time Keeping and Time Booking 5.4 Treatment of Idle Time and Overtime Cost 5.5 Wage Rates for Costing and Systems of Wage Payment 5.5.1 Time Rate and Piece Rate system 5.5.2 Incentive Plans 5.6 Answers to Check Your Progress Questions 5.7 Summary 5.8 Key Words 5.9 Self Assessment Questions and Exercises 5.10 Further Readings UNIT 6 OVERHEAD COST CONTROL 112-151 6.0 Introduction 6.1 Objectives 6.2 Classification of Overheads 6.3 Allocation, Apportionment and Methods 6.4

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Cost Accounting, Study Material- new.pdf (D44082039)

Absorption of Overheads and Its Methods 6.4.1 Types of Overhead Rates 6.5 Administration, Selling and Distribution Overheads 6.6 Under-Absorption and Over-Absorption of Overheads 6.7

Answers to Check Your Progress Questions 6.8 Summary 6.9 Key Words 6.10 Self Assessment Questions and Exercises 6.11 Further Readings BLOCK 2: TYPES OF COSTING UNIT 7 METHODS OF COSTING: JOB COSTING 152-161 7.0 Introduction 7.1 Objectives 7.2 Job Costing 7.3 Contract Costing, Target Costing and Escalation Clause 7.4 Answers to Check Your Progress Questions 7.5 Summary 7.6 Key Words 7.7 Self Assessment Questions and Exercises 7.8 Further Readings UNIT 8 UNIT COSTING 162-174 8.0 Introduction 8.1 Objectives 8.2 Meaning of Unit Costing 8.2.1 Procedure in Unit Costing and Preparation of Cost Sheet 8.3 Answers to Check Your Progress Questions 8.4 Summary 8.5 Key Words 8.6 Self Assessment Questions and Exercises 8.7 Further Readings UNIT 9 PROCESS COSTING 175-204 9.0 Introduction 9.1 Objectives 9.2 Process Costing: Features and Process Cost Accounts 9.2.1 Features 9.2.2 Job Costing vs. Process Costing 9.2.3 Process Costing Procedure and Process Cost Accounts 9.2.4 Important Adjustments including Inter-Process Profits 9.3 Accounting for Joint and By Products 9.4 Answers to Check Your Progress Questions 9.5 Summary 9.6 Key Words 9.7 Self Assessment Questions and Exercises 9.8 Further Readings BLOCK 3: BILL MARKET UNIT 10 CONTRACT COSTING: TYPES AND PROCEDURE 205-217 10.0 Introduction 10.1 Objectives 10.2 Procedure for Contract Costing 10.3 Types of Contract Costing 10.3.1 Profit from Incomplete Contract 10.3.2 Escalation Clause 10.3.3 Cost-plus Costing 10.4 Answers to Check Your Progress Questions 10.5 Summary 10.6 Key Words 10.7 Self Assessment Questions and Exercises 10.8 Further Readings UNIT 11 OPERATING COSTING 218-227 11.0 Introduction 11.1 Objectives 11.2 Meaning and Features of Operating Costing 11.2.1 Cost Unit 11.3 Transport Costing and Operating Cost Sheet 11.4

Answers to Check Your Progress Questions 11.5 Summary 11.6 Key Words 11.7 Self Assessment Questions and Exercises 11.8 Further Readings UNIT 12 BATCH COSTING 228-234 12.0 Introduction 12.1 Objectives 12.2 Meaning and Applicability of Batch Costing 12.2.1 Economic Batch Quantity (EBQ) 12.3 Answers to Check Your Progress Questions 12.4 Summary 12.5 Key Words 12.6 Self Assessment Questions and Exercises 12.7 Further Readings UNIT 13 STANDARD COSTING 235-266 13.0 Introduction 13.1 Objectives 13.2

Standard Costing: Definition, Application, Advantages and Limitations 13.3 Variance Analysis 13.4

Answers to Check Your Progress Questions 13.5 Summary 13.6 Key Words 13.7 Self Assessment Questions and Exercises 13.8 Further Readings

BLOCK 4: RECONCILIATION OF COST AND FINAL ACCOUNT UNIT 14 RECONCILIATION OF ACCOUNTS, COST CONTROL AND REDUCTION 267-280 14.0 Introduction 14.1 Objectives 14.2 Reconciliation

of Cost and Final Accounts 14.2.1 Procedure 14.3 Cost Control and Cost Reduction 14.3.1 Distinction between Cost Control and Cost Reduction 14.3.2

Scope and Areas of Cost Reduction 14.3.3 Tools and Techniques of Cost Reduction and Cost Control and their Advantages 14.3.4 Essentials for the Success

of Cost Control and Cost Reduction 14.3.5 Advantages of Cost Reduction 14.4 Answers to Check Your Progress Questions 14.5 Summary 14.6 Key Words 14.7 Self Assessment Questions and Exercises 14.8 Further Readings

INTRODUCTION

The business environment has undergone a revolutionary change due to free competition and globalization. The whole world has become a global village where products and services are highly competitive. As a result, cost accounting has gained special importance in all business activities. Cost Accounting has become an important tool of management. Modern industrial enterprises now design cost accounting systems and procedures not only for providing historical data for cost ascertainment but also for assisting the management in controlling and cost-reducing endeavours. As a matter of fact, a cost accountant these days is now more concerned with providing relevant and significant cost data to management for decision-making. Costing methods and techniques have also undergone a revolutionary change in this process. New techniques and procedures are being devised by cost accountants for better cost management. In this book,

Advanced

Cost Accounting, various aspects of cost accounting has been discussed including the cost accounting principles; the material, labour and overhead cost control; different methods and types of costing; reconciliation of cost and final accounts as well as the concept of cost control and cost reduction.

This book, Advanced Cost Accounting, is written with the distance learning student in mind. It is presented in a user-friendly format using a clear, lucid language. Each unit contains an Introduction and a list of Objectives to prepare the student for what to expect in the text. At the end of each unit are a Summary and a list of Key Words, to aid in recollection of concepts learnt. All units contain Self- Assessment Questions and Exercises, and strategically placed Check Your Progress questions so the student can keep track of what has been discussed. NOTES Self-Instructional Material

Cost Accounting Principles NOTES Self-Instructional Material 1 BLOCK - I COST ACCOUNTING AND COST CONTROL UNIT 1 COST ACCOUNTING PRINCIPLES Structure 1.0 Introduction 1.1 Objectives 1.2 Meaning and

Objectives of Costing and Cost Accounting 1.2.1 Meaning of Cost 1.3 Installation of a Costing System 1.4 Answers to Check Your Progress Questions 1.5 Summary 1.6 Key Words 1.7 Self Assessment Questions and Exercises 1.8 Further Readings 1.0 INTRODUCTION

Cost Accounting is concerned with ascertainment of cost of products/services. Cost accounting has primarily developed to help managers understand the costs of running a business. Profit and loss account and balance sheet are presented to the management by the financial accountant. But modern management needs much more detailed information than those supplied by these financial statements. Cost accounting provides detailed cost information to various levels of management for efficient performance of their functions. The information supplied by cost accounting acts as a management tool for decision making, to optimize the utilization of scarce resources and ultimately add to the profitability of business by controlling expenditure under various heads.

In this unit, you will learn about the concept of cost accounting, costing, cost accountancy, and the main elements and installation of

a costing system. Accounting information system is vital to all business enterprises. This system combines the accounting principles and concepts with the benefits of an information system. It is used to analyse and record business transactions, to

provide financial information concerning the activities of an enterprise to a diverse group of people such as shareholders, managers, creditors, tax authorities, etc. On the basis of the purpose for which this information is used, accounting is divided into three parts— financial accounting, cost accounting and management accounting.

This overview unit provides a framework of cost accounting, explaining its basic concepts.
Cost

Accounting Principles NOTES Self-Instructional 2 Material 1.1

OBJECTIVES After going through this unit, you will be able to: ? Describe the meaning of cost and

cost accounting ? Discuss the objectives of cost accounting ?

Explain the installation of a costing system 1.2

MEANING AND OBJECTIVES OF COSTING AND COST ACCOUNTING

The Chartered Institute of Management Accountants (CIMA), London has defined costing as, 'the techniques and processes of ascertaining

costs.' Wheldon has defined costing as, 'the proper allocation of expenditure and involves the collection of costs for every order, job, process, service or unit.' Thus,

costing simply means cost finding by any process or technique.

It consists of principles and rules which are used for determining: (a) the cost of manufacturing a product, e.g., motor car, furniture, chemical, steel and paper and (b) the cost of providing a service, e.g., electricity, transport and education.

The terms 'costing' and 'cost accounting' are often used interchangeably.

Cost accounting is a formal system of accounting for costs in the books of account, by means of which, costs of products and services are ascertained and controlled.

According to

L C Cropper, 'cost accounting means a specialized application of the general principles of accounting, in order to ascertain the cost of producing and marketing any unit of manufacture or of carrying out any particular job or contract.'

An authoritative definition of cost accounting has been given by CIMA, London as follows: '

Cost accounting is the process of accounting for costs from the point at which expenditure is incurred or committed

to the establishment of its ultimate relationship with cost centres and cost units.

In its widest usage, it embraces the preparation of statistical data, the application of cost control methods and ascertainment of profitability of activities carried out or planned.'

Costing and Cost Accounting—Difference: Though

the terms 'costing' and 'cost accounting' are interchangeably used, there is a difference between the two. Costing is simply the method of determining costs by using any method like arithmetic process, memorandum statements, etc.

Cost accounting, on the other hand, denotes the formal accounting mechanism, by means of which costs are ascertained by recording them in the books of account. In simple words, costing means finding out the cost of products or services by any technique or method, while cost accounting means costing using the double entry system.

Cost

Accounting Principles NOTES Self-Instructional Material 3

Cost Accountancy: Cost accountancy is a very wide term. It means and includes the principles, conventions, techniques and systems which

are employed in a business to plan and control the utilization of its resources.

It is defined by CIMA, London

as, '

the application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost

control and the ascertainment of profitability.

It includes

the presentation of information derived therefrom for the purposes of managerial decision making.'

Cost

accountancy is thus the science, art and practice of a cost accountant. It is a science in the sense that it is a body of systematic knowledge,

which a cost accountant should possess for the proper discharge of his duties and

responsibilities. It is an art as it requires the ability and skill

on the part of

a cost accountant, in applying the principles of cost accountancy to various managerial problems,

like price fixation, cost control, etc. Practice refers to constant efforts on the part of cost accountant, in the field of cost accountancy. Theoretical knowledge alone would not enable a cost accountant to deal with the various intricacies involved. He should, thus, have sufficient practical training, and exposure to real life costing dilemmas.

Cost accountancy has a very wide scope. It includes costing, cost accounting, cost control and cost audit. Applications of Cost Accounting Cost accounting is generally considered as being applicable only to manufacturing concerns. This is not so. Its applications are in fact much wider. All types of activities, manufacturing and non-manufacturing, in which monetary value is involved, should consider the use of cost accounting. Wholesale and retail businesses, banking and insurance companies, railways, airways, shipping and road transport companies, hotels, hospitals, schools, colleges, universities, farming and cinema houses, all may employ cost accounting techniques to operate efficiently. It is only a matter of recognition by the management of the applicability of these costing concepts and techniques in their own fields of endeavour. Objectives and Functions

of Cost Accounting The

main objectives of cost accounting are as follows: 1.

Ascertainment of cost: This is the primary objective of cost accounting.

In cost

accounting, cost of each

unit of production, job, process or department, etc., is ascertained. Not only actual costs incurred are ascertained but costs are also predetermined for various purposes. For cost ascertainment, various methods and techniques are

employed under different situations. 2. Cost control and cost reduction: Cost accounting aims at improving profitability by controlling and reducing costs. For this purpose, various specialized techniques, like standard costing, budgetary control, inventory

Cost Accounting Principles NOTES Self-Instructional 4 Material

control, value analysis, etc., are used. This objective of cost control and cost reduction is becoming increasingly important in the present scenario because of growing competition in the business world. 3.

Guide to business policy: Cost accounting aims at serving the needs of the management in conducting the business with utmost efficiency. Cost data provide guidelines for various managerial decisions, like making or buying, selling below cost, utilization of idle plant capacity, introduction of a new product, etc. 4.

Determination of selling price: Cost accounting provides cost information on the basis of which selling prices of products or services may be fixed. In periods of depression, cost accounting guides the firms in deciding the extent to which the selling prices may be reduced to meet the situation.

In order to realize these objectives, the data provided by cost accounting may have to be re-classified, re-organized and supplemented by other relevant business data from outside the formal cost accounting system. 1.2.1 Meaning of

Cost

The term 'cost' does not have a definite meaning and its scope is extremely broad and general. It is, therefore, not easy to define or explain this term without leaving any doubt concerning its meaning. Cost accountants, economists and others develop the concept of cost according to their needs because one complete description of 'cost' to suit all situations is not possible.

According to

Cambridge International Dictionary of English, cost means 'the amount of money needed to buy, do or make something.' However, some authoritative definitions

of cost are given below: 1.

Cost is '

the amount of expenditure (actual or notional), incurred or attributable to a given thing.' (

CIMA,

London) 2. '

A

cost is the value of economic resources used as a result of producing or doing the things costed.' (W M Harper) 3. '

Cost

is a measurement, in monetary terms, of

the amount of resources used for the purpose

of production of goods or rendering of services.' ICWA of India

In fact, in order to assign a definite meaning to the term 'cost', it should be used with a modifier or an adjective, according to the specific purpose for its use. For example, direct cost, fixed cost, variable cost, controllable cost, material cost, selling cost, prime cost, marginal cost, differential cost, standard cost, estimated cost, actual cost, joint cost, conversion cost, etc., have specific meanings.

Cost vs Expense and Loss Often the terms 'cost' and 'expense' are used interchangeably. But cost should be distinguished from expense and loss.

Cost Accounting Principles NOTES Self-Instructional Material 5

Expense:

Expense is defined as 'an expired cost resulting from a productive usage of an asset.'

It is that cost which has been applied against revenue of a particular accounting period, in accordance with the principle of matching costs to revenue. In other words, an expense is that portion of the revenue- earning potential of an asset which has been consumed in the generation of revenue. Unexpired or unconsumed part of the cost is recorded as an asset in the balance sheet. Such an unexpired cost is converted into an expense when it expires while helping to earn revenue.

For example, when a plant is purchased, depreciation on plant (expired cost) is charged to the profit and loss account as an expense and cost of plant remaining after providing depreciation (unexpired cost) is shown as an asset in the balance sheet. Every year, depreciation on plant, representing expense, is debited to profit and loss account and depreciated value representing unexpired cost is shown in the balance sheet. Pre-paid insurance is also an example of unexpired cost which is shown in the balance sheet as an asset.

Loss: Loss is defined as 'reduction in a firm's equity, other than from withdrawals of capital for which no compensating value has been received.' A loss is an expired cost resulting from the decline in the service potential of an asset that generated no benefit to the firm.

Obsolescence or destruction of stock by fire are examples of loss.

Cost Centre

For the purpose of ascertaining cost, the whole organization is divided into small parts or sections. Each small section is treated as a cost centre

of which cost is ascertained.

A cost centre is defined by CIMA, London

as '

a location, person, or item of equipment (or group of these), for which costs may be ascertained and

used for

the purpose of control.'

Thus, a

cost centre refers to a section

of the

business to which costs can be charged. It may be a location (a department, a sales area), an item of equipment (a machine, a delivery van), a person (a salesman, a machine operator) or a group of these (two automatic machines operated by one workman). The main purpose of ascertaining the cost of a cost centre is control of cost. Cost centres are primarily

of two types: (a) Personal

cost centre—which consists of a person or a group of persons. (b) Impersonal cost centre—which consists of a location or

an item of equipment or group of these. From

a functional point of view, cost centres may be of the following two types: (a)

Production cost centre: These are those cost centres where actual production work takes place. Examples are, weaving department in a textile mill, melting shop in a steel mill and cane crushing shop in a sugar mill. (b) Service cost centre: These are those

cost centres which are ancillary to and render services to production cost centres. Examples of service cost centres are power house, tool room, stores department, repair shop and canteen.

Cost Accounting

Principles NOTES Self-Instructional 6 Material

A cost accountant sets up cost centres to enable himself to ascertain the costs he needs to know. A cost centre is charged with all the costs that relate to it, e.g., if a cost centre is a machine, it will be charged with the costs of power, light, depreciation and its share of rent, etc.

The purpose of ascertaining the cost of a cost centre is cost control.

The person in charge of a cost centre is held responsible for the control of cost of that centre.

Cost Unit It has been seen above that cost centres help in ascertaining costs by location, equipment or person.

A cost unit goes a step further by breaking up the cost into smaller sub-divisions, thereby helping in ascertaining the cost of saleable products or services.

A cost unit is defined by CIMA, London as a 'unit of product or service in relation to which costs are ascertained.'

For example, in a sugar mill, the cost per tonne of sugar may be ascertained, in a textile mill the cost per metre of cloth may be ascertained. Thus 'a tonne' of sugar and 'a metre' of cloth are cost units. In short, cost unit is unit of measurement of cost. All sorts of cost units are adopted, the criterion for adoption being the applicability of a particular cost unit to the circumstances under consideration. Broadly, cost units may be of two types as explained below: (i)

Units of production, e.g., a ream of paper, a tonne of steel or a metre of cable. (ii) Units of service, e.g., passenger miles, cinema seats or consulting hours. The cost units and cost centres should be those which are natural to the business and which are readily understood and accepted by all concerned.

Cost Object Cost object may be defined as 'anything for which a separate measurement of cost may be desired.' A cost accountant may want to know the cost of a particular 'thing' and such a 'thing' is called a cost object. A cost object may be a product, service, activity, department or process, etc.

Examples of cost objects are given as follows: Cost Object Examples Product Car, shaving razor, computer, etc. Service Telephone hotline, taxi service Process Melting process in a steel mill, weaving process in a textile mill Activity Developing a website on the Internet, Purchasing raw material Department Personnel department, Stores department, etc.

Cost Accounting Principles NOTES Self-Instructional Material 7 1.3 INSTALLATION OF A COSTING SYSTEM There cannot be a readymade costing system for every undertaking. In order to meet the special needs of a business, a costing system has to be specially devised to give it a blend of efficiency and economy.

The installation of a costing system requires a thorough study and understanding of all the aspects involved, otherwise the system may be a misfit and enterprise will not be able to derive full advantage from it.

To start with,

it is important to make cost benefit analysis, i.e., weigh the cost of the system against the likely benefits to be derived from it.

The benefits from the system must exceed the amount spent on it.

The management must feel the need for it and should be able to make full use of the information available from the system in the conduct of business. In other words, the system should be justified on the basis of its value to the management.

Steps in Installation The installation of a costing system requires the following steps: 1. Preliminary investigations should be made relating to the technical aspects of the business. For instance, the nature of the product and methods of production will determine the type of costing system to be applied. 2. The organization structure of the business should be studied to ascertain the scope of authority of each executive. The existing organization should be disturbed to the minimum, as may be advisable after full consideration. 3. The methods of purchase, storage and issue of materials should be examined and modified as per requirements. 4. The existing methods of remunerating labour should be examined for the purpose of introducing any incentive plans. 5. Forms and accounting records should be so designed so as to involve minimum clerical labour and expenditure. 6. The size and layout of the factory should be studied. 7. The system should be effective in cost control and cost reduction. 8. Costing system should be simple and easy to operate. Unnecessary details should be avoided. 9. The installation and operation of the system should be economical. 10. The system should be introduced gradually. Practical Difficulties Apart from technical costing problems, a cost accountant is confronted with certain practical difficulties in installing a costing system. These are: 1. Lack of support of top management: In order to make the costing system a success, it must have the whole-hearted support of every member of the

Cost Accounting Principles NOTES Self-Instructional 8 Material management. Many a time, the costing system is introduced at the behest of the Managing Director or the Financial Director without the support of functional managers. They view the system as an interference in their work and do not make use of the system. Before the system is installed, the cost accountant should ensure that the management is fully committed to the costing system. A sense of cost consciousness should be created in their minds by explaining to them that the system is for their benefit. A cost manual should be prepared and distributed to them giving the details and functions of the system. 2. Resistance from the accounting staff: The existing accounting staff may not welcome the new system. This may be because they look with suspicion at a system which is not known to them.

The cooperation of the employees should be sought by convincing them that the system is

needed to supplement the financial accounting system and that it is for the betterment of all. 3. Non-cooperation of working and supervisory staff: Correct activity data which is supplied by supervisory staff and workers is necessary for a costing system. They may not cooperate and resist the additional paper work arising as a result of the introduction of the system. Such resistance generally arises out of ignorance. Proper education should be given to the staff regarding benefits of the system and the important roles they have to play to make it successful. 4. Shortage of trained staff: In the initial stages, there may be shortage of trained costing staff. The staff should be properly trained so that the costing department can run efficiently. Check Your Progress 1. What are the elements included in the scope of cost accountancy? 2. How does cost accounting helps firms in periods of depression? 3. Define cost object. 1.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS 1. Cost accountancy has a very wide scope. It includes costing, cost accounting, cost control and cost audit. 2.

In periods of depression, cost accounting guides the firms

in deciding the extent to which the selling prices may be reduced to meet the situation. 3.

Cost object may be defined as 'anything for which a separate measurement of cost may be desired.'

Cost Accounting

Principles NOTES Self-Instructional Material 9 1.5 SUMMARY ?

Costing as, 'the techniques and processes of ascertaining costs.' Wheldon has defined costing as, 'the proper allocation of expenditure and involves the collection of costs for every order, job, process, service or unit.' ?

Cost accounting is a formal system of accounting for costs in the books of account, by means of which, costs of products and services are ascertained and controlled. ?

Cost

accountancy is a wide term. It means and includes the principles, conventions, techniques and systems which are employed in a business to plan and control the utilization of its resources. ?

The main objectives of cost accounting include: ascertainment of cost, cost control and reduction, guide to business policy, and determination of selling price. ?

The term 'cost' does not have a definite meaning and its scope is extremely broad and general. ? Expense is

that cost which has been applied against revenue of a particular accounting period, in accordance with the principle of matching costs to revenue. ?

For the purpose of ascertaining cost, the whole organization is divided into small parts or sections. Each small section is treated as a cost centre of which cost is ascertained. ?

The installation of a costing system requires a thorough study and understanding of all the aspects involved, otherwise the system may be a misfit and enterprise will not be able to derive full advantage from it. ?

Some of the practical difficulties in installing a costing system include: lack of support of top management, resistance from the accounting staff, non-cooperation of working and supervisory staff and shortage of trained staff. 1.6

KEY WORDS ? Cost Accounting: It is a specialized branch of accounting, which is concerned with 'the techniques and processes of ascertaining costs' of products and services. ? Cost: It is defined as a measurement, in monetary terms, of the amount of resources used for the purpose of production of goods or rendering of services.

Cost

Accounting

Principles

NOTES Self-Instructional 10 Material 1.7 SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer Questions 1.

What

are the three parts into which accounting is divided? 2. What are the main objectives of cost accounting? 3. Compare cost to expense and loss. 4. Write a short note on cost unit and cost centre. Long Answer Questions 1. Explain the difference between costing, cost accounting and cost accountancy. 2. Describe the steps involved and practical difficulties in the installation of a costing system. 1.8

FURTHER READINGS

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Cost Concepts NOTES Self-Instructional Material 11 UNIT 2 COST CONCEPTS Structure 2.0 Introduction 2.1 Objectives 2.2 Elements of Cost 2.2.1

Cost Sheet (Cost Statement) 2.3

Methods and Systems of Costing 2.3.1 Techniques of Costing 2.3.2 Classifications of Cost 2.4 Answers to Check Your Progress Questions 2.5 Summary 2.6 Key Words 2.7 Self Assessment Questions and Exercises 2.8 Further Readings 2.0 INTRODUCTION Cost

concepts covers all the aspects related to costs in cost accounting. You have studied in Unit 1 that cost is different from

expense and loss. Where expense is an expired cost resulting from productive usage of an asset, loss is an

expired cost resulting from the decline in the service potential of an asset that generated no benefit to the firm.

You also studied how the meaning of the word cost changes as per the specific purpose of its use. What are the specific purpose of its use, what are the elements of cost, what are its classifications, its methods and techniques and how a cost sheet is prepared are the topics that will be discussed in this unit. 2.1

OBJECTIVES After going through this unit, you will be able to: ? Discuss the elements of cost ? Describe the preparation of

a cost sheet ? Explain the methods and systems of

costing ? Recall the techniques of costing 2.2

ELEMENTS OF COST A cost is composed of three elements, i.e., material, labour and expense. Each of these elements may be direct or indirect. This is

shown as follows:

Cost Concepts NOTES Self-Instructional 12 Material

Fig. 2.1 Primary Elements of Cost Material Cost According to CIMA, London,

material cost is 'the cost of commodities supplied to an undertaking.'

Material cost

includes cost of procurement, freight inwards, taxes, insurance, etc., directly attributable to the acquisition. Trade discounts, rebates, duty drawbacks, refund on account of modvat, sales tax, etc., are deducted in determining the cost of material. Materials may be direct or indirect. Direct materials: Direct material cost is that which can be conveniently identified with and allocated to cost units. Direct materials generally become a part of the finished product. For example, cotton used in a textile mill is a direct material. However, in many cases, though a material forms a part of the

finished product, yet, it is not treated as direct material; e.g., nails used in furniture, thread used in stitching garments, etc.

This is because value of such materials is so small that it is quite difficult and futile to measure

it. Such materials are treated as indirect materials. Indirect materials: These are those materials which cannot be

conveniently identified with individual cost units. These are minor in importance, such as (i) small and relatively inexpensive items which may become a part of the finished product, e.g., pins, screws, nuts and bolts, thread, etc., (ii)

those items which do not physically become a part of the finished products, e.g., coal, lubricating oil and grease, sand paper used in polishing, soap, etc. Labour Cost

This

is 'the cost of remuneration (wages, salaries, commissions, bonuses, etc.) of the employees of an undertaking' (CIMA). It includes all

fringe benefits like P.F. contribution, gratuity, ESI, overtime, incentive bonus, wages for holidays, idle time, etc. Direct

labour: Direct labour cost consists of wages paid to workers directly engaged in converting raw materials into finished products. These wages can be conveniently identified with a particular product, job or process. Wages paid to a machine

operator is a case of direct wages. Indirect labour: It is of general character and cannot be conveniently identified with a particular cost unit. In other words, indirect labour is not directly engaged in the production operations but only to assist or help in production operations.

Cost Concepts NOTES Self-Instructional Material 13 Expenses All costs

other than material and labour are termed as expenses. It is defined as 'the cost of services provided to an undertaking

and the notional cost of the use of owned assets' (CIMA). Direct expenses: Accord-ing to CIMA, London, 'direct expenses are those expenses which can be identified with and allocated to cost centres or units.'

These are those expenses which are specifically incurred in connection with a particular job or cost unit. Direct expenses are also known as chargeable expenses. Indirect expenses: All indirect costs, other than indirect materials and indirect labour costs, are termed as indirect expenses. These cannot be directly

identified with a particular job, process or work order and are common to cost units or cost centres. Prime Cost This is the aggregate of direct material cost, direct labour cost and direct expenses.

Thus, Direct material + Direct labour + Direct expenses = Prime Cost Overheads These are

the aggregate of indirect

material

cost, indirect labour cost and indirect expenses.

material

cost, indirect labour cost and indirect expenses.

Thus, Indirect material + Indirect labour + Indirect expenses = Overheads

Fig. 2.2 Elements of Cost

Cost Concepts NOTES Self-Instructional 14 Material Overheads are divided into three groups as follows: 1.

Production overheads: Also known as factory overheads, works overheads or manufacturing overheads, these are those overheads which are concerned with the production function. They include indirect materials, indirect wages and indirect expenses in producing goods or services. (a) Indirect material—Examples: Coal, oil, grease, etc.; stationery in factory office, cotton waste, brush and sweeping broom. (b) Indirect labour—Examples: Works manager's salary, salary of factory office staff, salary of inspector and supervisor, wages of factory sweeper and wages of factory watchman. (c) Indirect expenses—Examples: Factory rent, depreciation of plant, repair and maintenance of plant, insurance of factory building, factory lighting and power and internal transport expenses. 2. Office and administration overheads: These are the indirect expenditures incurred in general administrative function, i.e., in formulating policies, planning and controlling the functions, directing and motivating the personnel of an organization in the attainment of its objectives. These overheads are of general character and have no direct connection with production or sales activities. This category of overheads is also classified into

indirect material, indirect labour and indirect expenses. (a) Indirect material—Examples: Stationery used in general administrative office, postage, sweeping broom and brush. (b) Indirect labour—Examples: Salary of office staff, salary of managing

director, remuneration of directors of the company. (c) Indirect expenses—Examples: Rent of office building, legal expenses, office lighting and power, telephone expenses, depreciation of office furniture and equipments, office air-conditioning and sundry office

expenses. 3. Selling and distribution overheads: Selling overheads are the costs of promoting sales and retaining customers. They are defined as 'the cost of seeking to create and stimulate demand and of securing orders.'

Examples are advertisements, samples and free gifts and salaries of salesmen. Distribution cost includes all expenditure incurred

from the time the product is completed until it reaches its destination. It

is defined as 'the cost of sequence of operations

which begins with making the packed product available for dispatch and ends with making the reconditioned

returned empty

packages if any, available for

reuse.'

Examples are carriage outwards, insurance of goods in transit, upkeep of delivery vans and warehousing. Selling and distribution overheads are

also grouped into indirect material, indirect labour and indirect expenses.

Cost Concepts NOTES Self-Instructional Material 15 (

a) Indirect material—Examples: Packing material; stationery used in sales office, cost of samples, price list; catalogues, oil, grease etc., for delivery vans, etc. (b) Indirect labour—Examples: Salary of sales manager, salary of sales office staff, salary of warehouse staff and salary of drivers of delivery vans. (c) Indirect expenses—Examples: Advertising, travelling expenses, showroom expenses, carriage outwards, rent of warehouse, bad debts and insurance of goods in transit.

Illustration 2.1: A manufacturer has shown an amount of `19,310 in his books as 'Establishment' which really include the following expenses: ` Interest on debentures 1,200 Agents' commission 6,750 Warehouse wages 1,800 Warehouse repairs 1,500 Lighting of office 70 Office salaries 1,130 Director's remuneration 1,400 Travelling expenses of salesmen 1,760 Rent, rates and insurance of warehouse 310 Rent, rates and insurance of office 230 Lighting of warehouse 270 Printing and stationery 1,500 Trade magazine 70 Donations 150 Bank charges 100 Cash discount allowed 770 Bad debts 300 From the information prepare a statement showing total: (a) Selling expenses (c) Administration expenses (b) Distribution expenses (d) Expenses which you would exclude from costs (Adapted) Solution: (a) Selling Expenses: `

Agents' commission 6,750 Travelling expenses of salesmen 1,760 Bad debts 300 Total 8,810

Cost Concepts NOTES Self-Instructional 16 Material (

b) Distribution Expenses: ` Warehousing wages 1,800 Warehouse repairs 1,500 Rent, rates and insurance of warehouse 310 Lighting of warehouse 270 Total 3,880 (c) Administration Expenses: ` Office salaries 1,130 Office lighting 70 Director's remuneration 1,400 Rent, rates and insurance of office 230 Printing and stationery 1,500 Trade magazine 70 Total 4,400 (d) Items not included in costs: ` Donations 150 Cash discount allowed 770 Bank charges 100 Interest on debentures 1,200 Total 2,220

Components of

Total Cost—Elements of cost may be grouped as follows: (i)

Prime Cost = Direct material + Direct labour + Direct expenses (ii) Works Cost or Factory Cost =

Prime cost + Factory overheads (iii) Cost of Production = Works cost + Administration overheads (iv) Total Cost or Cost of Sales = Cost of production + Selling and distribution

overheads 2.2.1

Cost Sheet (Cost Statement) It is a statement which is prepared periodically to provide

detailed cost of a cost centre or cost unit. A cost sheet

not only shows the total cost but also the various components of the total cost. Period covered by a cost sheet may be a year, a month or a week, etc.

Illustration 2.2: From the following information for the month of January, prepare a cost sheet to show the following components: (a) Prime Cost, (b) Factory Cost, (c) Cost of Production, (d) Total Cost. Direct material 57,000 Direct wages 28,500

Cost Concepts NOTES Self-Instructional Material 17

Factory rent and rates 2,500 Office rent and rates 500 Plant repairs and maintenance 1,000 Plant depreciation 1,250

Factory heating and lighting 400 Factory manager's salary 2,000 Office salaries 1,600 Director's remuneration 1,500

Telephone and postage 200 Printing and stationery 100 Legal charges 150 Advertisement 1,500 Salesmen's salaries 2,500

Showroom rent 500 Sales 1,16,000 Solution: Cost Sheet

for the Month of Jan.

Direct materials 57,000 Direct wages 28,500 Prime Cost 85,500 Factory Overheads: Factory rent and rates 2,500 Plant repair and maintenance 1,000 Plant depreciation 1,250 Factory heating and lighting 400 Factory manager's salary 2,000 7,150 Factory Cost 92,650 Office and Administration Overheads: Office salaries 1,600 Director's remuneration 1,500 Telephone and postage 200

Office rent and rates 500 Printing and stationery 100 Legal charges 150 4,050 Cost of Production 96,700

Cost Concepts NOTES Self-Instructional 18 Material

Selling and Distribution Overheads: Advertisement 1,500 Salesmen's salaries 2,500 Showroom rent 500 4,500 Total cost (or cost of sales) 1,01,200 PROFIT 14,800 Sales 1,16,000

Check Your Progress 1. Give examples of indirect materials in material cost. 2. What is

the aggregate of direct material cost, direct labour cost and direct expenses? 2.3

METHODS AND SYSTEMS OF COSTING In this section, you will learn about the methods and systems, techniques and classification of costing.

Methods and Systems of Costing The methods or types of costing refer to the techniques and processes employed in the ascertainment of costs. Several methods have been designed to suit the needs of different industries. The method of costing to be applied in a particular concern depends upon the type and nature of manufacturing activity.

Basically, there are two methods of costing: 1. Job costing or job order costing 2. Process costing

All other methods are variations of either job costing or process costing.

The various methods given here are in outline only and detailed discussion of each of these is given in later units. 1.

Job order costing: This method 'applies where work is undertaken to customers' special requirements.' Cost unit in job order costing is taken to be a job or work order for which costs are separately collected and computed. A job, big or small, comprises a specific quantity of a product or service to be provided as per customer's specifications. Industries where this method is used include printing repair shops, interior decoration and painting. 2. Contract costing or terminal costing: This is a variation of job costing and, therefore, principles of job costing apply to this method. The difference between job and contract is that job is small and contract is big. It is well said that a contract is a big job and a job is a small contract. The cost

Cost Concepts NOTES Self-Instructional Material 19

unit here is a 'contract' which is of a long duration and may continue over more than one financial year. Contract costing is most suited to construction of buildings, dams, bridges and roads, shipbuilding, etc. 3. Batch costing: Like contract costing, this is also a variation of job costing. In this method, the cost of a batch or group of identical products is

ascertained and therefore each batch of products is a cost unit for which costs are ascertained. This method is used in companies engaged in the production of readymade garments, toys, shoes, tyres and tubes, component parts, bakery, etc. 4. Process costing: As distinct from job costing, this method is used in mass production industries manufacturing

standardized products in continuous processes of manufacturing. Costs are accumulated for each process or department. Here raw material has to

pass through a number of processes in a particular sequence to the completion stage. In order to arrive at

cost per unit,

the

total cost of a process is divided

by the number of units produced. The

finished product of

one process is passed on to the next process as raw material. Textile mills, chemical works, sugar mills, refineries, soap manufacturing, etc., may be cited as examples of industries which employ this method.

5. Operation costing: This is nothing but a refinement and a more detailed application of process costing. A process may consist of a number of operations and operation costing involves cost ascertainment for each operation instead of a process.

This method provides minute analysis of costs and ensures greater accuracy and better

control. 6. Single, output or unit costing: This method of cost ascertainment is used when production is uniform and consists of a single or two or three varieties of the same product. Where the product is produced in different grades,

costs are ascertained grade-wise. As the units of output

are identical,

the

cost per unit is found

by dividing the total cost by the

number of

units produced.

This method is applied in mines, quarries,

brick kilns, steel production, flour mills, etc. 7. Operating or service costing: This method should not be confused with operation costing. It is used in undertakings which provide services instead of manufacturing products. For example,

transport undertakings (road transport, railways, airlines, shipping companies), electricity companies, hotels, hospitals and cinemas, use this method. The cost units are passenger- kilometre or tonne-kilometre, kilowatt hours, a room per day in

a hotel, a seat per show in a cinema hall, etc. This method is a variation of process costing. 8. Multiple or composite

costing: It is an

application of more than one method of cost ascertainment with respect to the same product. This method is used in industries where a number of components are separately

Cost Concepts NOTES Self-Instructional 20 Material

manufactured and then assembled into a final product. For example, in a television set manufacturing company,

manufacture of different component parts may require different production methods and thus different methods of costing may have to be used. Assembly of these components into final product requires yet another method of costing.

Other examples of industries which make use of this method are air-conditioners, refrigerators, scooters, cars and locomotives. 2.3.1 Techniques of Costing It is the type of industry that determines which of the eight methods of costing

discussed above will be used in a particular enterprise. However, in addition to these methods, there are certain techniques of costing which are not alternatives to the methods discussed above. These techniques may be used for

special purpose of control and policy in any business irrespective of the method of costing being used there. These techniques have been briefly explained below: 1. Standard costing: This is a very valuable technique of controlling cost.

In this technique, standard cost is predetermined as target of performance, and actual performance is measured against the standard. The difference between standard and actual costs are analysed to know the reasons for the difference so

that corrective actions may be taken. 2. Budgetary control: Closely allied to standard costing is the technique of budgetary control. A budget is an expression of a firm's business plan in financial form and budgetary control is a

technique applied to the control of total expenditure on materials, wages and overheads by comparing actual performance with planned performance. Thus, in addition to its use in planning, the budget is also used for control and

co-ordination of business operations. 3. Marginal costing: In this technique, separation of costs into fixed and variable (marginal) is of special interest and importance. This is so because marginal costing regards only variable costs as the

cost of the products. Fixed cost is treated as period cost and no attempt is made to allocate or apportion this cost to individual cost centres or cost units. It is transferred to costing profit and loss account of the period. This technique

is used to study

the effect on profit of changes in volume or type of output. 4.

Total absorption costing: It is a traditional method of costing whereby total costs (fixed and variable) are charged to

products. This is in complete contrast to marginal costing where only variable costs are charged to products. Although until recently, this was the only technique employed by cost accountants, but now a days it is considered to have only a

limited application. 5. Uniform costing: This is not a separate technique or method of costing like standard costing or process costing. It simply denotes a situation in

Cost Concepts NOTES Self-Instructional Material 21

which a number of firms adopt a uniform set of costing principles. It has been defined by CIMA, London as '

the use by several undertakings of the same costing principles and/or practices.'

This helps to compare the performance of one firm with that of other firms and thus, to derive the benefit of anyone's better experience and performance. Costing Methods and Techniques are Tools Methods and techniques of costing described above should be regarded as tools of a cost accountant and it should not be construed that a particular method or technique is superior to any other. Just as a skilled workman uses different tools for different tasks, similarly, a cost accountant should use these methods and techniques appropriately either individually or in combination. For example, standard costing may be combined with process costing to give 'standard process costing', or standard costing may be combined with marginal costing as well as process costing to give 'standard marginal process costing'. Although this may appear confusing, yet if principles involved in each method or technique are clearly understood, there should not be any difficulty in making the best use of these methods and techniques. Cost Ascertainment and Cost Estimation

Cost Ascertainment: Cost ascertainment is concerned with computation of actual costs incurred. It refers to the methods and processes employed in ascertaining costs. It has been seen earlier that in different types of industries, different methods are employed for ascertaining cost.

These methods are job costing, contract costing, batch costing, process costing, operating costing, single costing and multiple costing. The basic principles underlying these methods are the same but these methods have been designed to suit the needs of individual business conditions. The ascertainment of actual cost has very little utility because of the following reasons: 1. Actual costs cannot be used for the purpose of price quotations and filling tenders. 2. Actual cost has practically no utility for cost control purposes. 3. Actual costs are ineffective as means of measuring performance efficiency. In spite of these limitations, ascertainment of actual costs proves very useful in many cases. For instance, ascertainment of actual costs reveals unprofitable activities, losses and inefficiencies occurring in the form of idle time, excessive scrap, etc.

Cost Estimation: As against ascertainment of actual costs, costs may also be predetermined. Cost estimation is the process of predetermining costs of goods or services. The costs are determined in advance of production and precede the operations. Estimated costs are definitely the future costs and are based on the

Cost Concepts NOTES Self-Instructional 22 Material

average of past actual costs adjusted for anticipated changes in future.

Cost estimates may have the following uses: 1. Cost estimates are used in making price quotations and bidding for contracts. 2. Cost estimates are used in the preparations of budgets. 3. They help in evaluating performance. 4. They are used in preparing projected financial statements. 5. Cost estimates may serve as targets in controlling the costs. Extreme care should be taken in cost estimation because a high price quotation may result in loss of business. 2.3.2 Classifications of

Cost Classification is the process of grouping costs according to their common characteristics.

It is

a

systematic placement of like items together according to their common features.

There are various ways of classifying costs

as given below. Each classification serves a different purpose: 1. Classification into Direct and Indirect Costs Costs are classified into

89%

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direct costs and indirect costs on the basis of their identifiability with cost units or jobs or processes or cost centres. Direct costs: These are those costs which

are incurred for and conveniently identified with a particular cost object. Cost of raw materials used

and wages of a machine operator are common examples of direct costs. To be specific, cost of steel used in manufacturing a machine can be conveniently known. It is, therefore, a direct cost. Similarly, wages paid to a tailor in a readymade garments company for stitching a pair of trousers is a direct cost because it can be easily identified in the cost of that garment. Indirect costs:

73%

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These are general costs and are incurred for the benefit of a number of cost

object.

These costs cannot be conveniently identified with a particular cost object. Depreciation of machinery, insurance, lighting, power, rent, managerial salaries, materials used in repairs, etc., are common examples of indirect costs. For example, depreciation of machine for stitching a pair of trousers cannot be known and thus it is an indirect cost. Costs are not traced or identified directly with a cost object for one of the following three reasons: 1. It is impossible to do so; e.g., rent of building. 2. It is not convenient or feasible to do so; e.g., nails used in furniture or sewing thread. 3. Management chooses not to do so; i.e., many companies classify certain items of cost as indirect because it is customary in the industry to do so;

Cost Concepts NOTES Self-Instructional Material 23

e.g., carriage inward may be treated as an indirect expense (alternatively, it may be treated as a part of the cost of materials purchased). The terms 'direct' and 'indirect' should be used in relation to the object of costing. An item of cost may be a direct cost in one case and the same may be indirect in another case. It is

the nature of business and the cost unit chosen that will determine

whether a particular cost is direct or indirect. For example, depreciation of asphalt mixing plant used by a road building contractor at site is a direct cost, whereas depreciation of plant used in a factory is an indirect cost. It is because in the factory, plant would probably benefit more than one cost unit and it may not be convenient to allocate depreciation to various cost units with any degree of accuracy. This classification is important from the point of view of accurate ascertainment of cost.

Direct costs of a product can be conveniently determined while the indirect costs have to be arbitrarily apportioned to various cost units. For example, in readymade garments, the cost of cloth and wages of tailor are accurately ascertained without any difficulty and are thus direct costs. But the rent of factory building, managerial salaries, etc., which are indirect costs, have to be apportioned to various cost units on some arbitrary basis and cannot be accurately ascertained. 2. Classification into Fixed and Variable Costs Costs behave differently when level of production rises or falls. Certain costs change in sync with production level while other costs remain unchanged. As such on the basis of behaviour or variability, costs are classified into fixed, variable and semi-variable. (i) Fixed costs: These costs remain constant in 'total' amount over a specific range of activity for a specified period of time, i.e., these do not increase or decrease when the volume of production changes.

For example, building rent and managerial salaries remain constant and do not change with change in output level and thus are fixed costs. But fixed cost 'per unit' decreases when volume of production increases and vice versa, fixed cost per unit increases when volume of production decreases.

The line representing fixed cost per unit

will not touch X-axis because the

fixed cost per unit cannot be zero. Relevant range – Fixed cost remains fixed only in relation to a given range of output and for a given time span. If the output is to be increased beyond the range, the fixed cost will also increase. Relevant range refers to the band of activity or volume in which specific relationship between the level of activity and the fixed cost in question is valid. The characteristics of fixed cost are: (a) fixed total cost within a relevant range of output;

Cost Concepts NOTES Self-Instructional 24 Material (

b) increase or decrease in per unit fixed cost when quantity of production changes; (c) apportioned to departments on some arbitrary basis; (d) such cost can be controlled mostly by top level management. (ii) Variable costs: These costs tend

to vary in direct proportion to the volume of output.

In other words, when volume of output increases, total variable cost also increases and vice versa, when volume of output decreases, total variable cost also decreases, but the variable cost per unit remains fixed. Thus, in general, variable costs show the following characteristics: (a) variability of the total cost

in direct proportion to the volume of output; (b) fixed cost per unit

in the face of changing volume; (c) easy and reasonably accurate distribution of cost to departments; (d) such costs can be controlled by functional managers. (iii) Semi-variable or semi-fixed costs (mixed costs): These costs include both a fixed and a variable component, i.e. these are partly fixed and partly variable. A semi-variable cost has a fixed cost element which needs to be incurred irrespective of the level of activity achieved. On the other hand, the variable element in semi-variable costs changes either at a constant rate or in lumps.

For example, introduction of an additional shift in the factory will require additional supervisors and certain costs will increase by steps. In the case of a telephone connection, there is a minimum rent and beyond a specified number of calls, the charges vary according to the number of calls made. In fact, there is no definite pattern of behaviour of semi-variable costs. 3.

Classification into Committed and Discretionary Costs It is explained above that costs may be classified into fixed and variable. Fixed costs are further classified into committed costs and discretionary (or programmed) costs. This classification is based on the degree to which a firm is locked into an asset or service that is generating the fixed cost. Committed costs: These are those costs that are incurred in maintaining physical facilities and managerial set up. Such costs are committed in the sense that once the decision to incur them has been made, they are unavoidable and invariant in the short run. For example, salary of the managing director may represent a committed cost if, by policy, the managing director is not to be relieved unless the firm is liquidated. Similarly, depreciation of plant and equipment is committed because these facilities cannot be easily changed in the short run. Discretionary costs: These are those costs which can be avoided by management decisions. Such costs are not permanent. Advertising, research and development cost and salaries of low level managers are examples of discretionary

Cost Concepts NOTES Self-Instructional Material 25

costs because these costs may be avoided or reduced in the short run, if so desired by the management. This classification into committed and discretionary costs is important from the point of view of cost control and decision making. 4. Classification into Product Costs and Period Costs Product costs: These costs include all such costs that are involved in acquiring or making a product. For a trader, product cost includes purchase cost plus freight inwards. For a manufacturer, these consist of direct materials, direct labour and factory overheads. Product costs are 'absorbed by' or 'attached to' the units produced. These are called inventoriable costs because these are included in the cost of product as work-in-progress, finished goods or cost of sales. Period costs: These are those costs which are not necessary for production and are incurred even if there is no production. These are written off as expenses in the period in which these are incurred.

Such costs are incurred for a time period and are charged to the profit and loss account of the period. Showroom rent, salary of company executives and travel expenses are examples of period costs. These costs are not inventoried, i.e., these are not included in the value of stocks. Administration and selling expenses are generally treated as period costs. Classification into product and period cost is important from the point of view of profit determination. This is so because product cost is carried forward to the next accounting period as part of the unsold finished stock, whereas period cost is written off in the accounting period in which it is incurred. 5. Classification into Controllable and Non-controllable Costs From the point of view of controllability, costs are classified into controllable costs

and non-controllable costs. Controllable costs:

These are the costs which may be directly regulated at a given level of management authority.

In other words, controllable costs are those costs which are subject to the discretion of the manager and hence can be kept within predefined limits. Variable costs are generally controllable by department heads. For example, cost of raw material may be controlled by purchasing in larger quantities. Non-controllable

costs:

These are those costs which cannot be influenced by the action of a specified member of an enterprise.

For example,

it is

very difficult to control costs like factory rent, managerial salaries, etc. Two important points should be noted regarding this classification. First, controllable costs cannot be distinguished from non-controllable costs without specifying the level and scope of management authority. In other words, a cost which is uncontrollable at one level of management may be controllable at another level of management. For example, a departmental manager may have no control

Cost Concepts NOTES Self-Instructional 26 Material

over the number of supervisors employed in his department, but this decision may have to be taken by the production manager. Thus, supervision cost will be non-controllable at the departmental manager's level, but it will be controllable at the level of production manager. Secondly, all costs are controllable in the long run at some appropriate management level. It is a misconception that variable costs are controllable and fixed costs are non-controllable. However, variable costs are more prone to control than fixed costs. 6. Classification into Historical Costs and Predetermined Costs On the basis of time of computation, costs are classified into historical costs and predetermined costs. Historical costs: These are the costs which are ascertained after these have been incurred. Historical costs are thus, nothing but actual costs. These costs are not available until after the completion of the manufacturing operations. Predetermined

costs: These are future

costs which

are ascertained in advance of production, on the basis of

a specification of all the factors affecting cost.

These costs are extensively used for the purpose of planning and control. 7. Classification into Normal and Abnormal Costs Normal cost may be defined as a cost which is normally incurred on expected lines at a given

level of output. This cost

is a part of cost of production. Abnormal

cost is that which is

not normally incurred at a given level of output.

Such cost is over and above the normal cost and is not treated as

a

part of the

cost of production. It is charged to costing profit and loss account.

Special Costs for Management Decision Making There are certain costs which are specially computed for use by the management for the purpose of decision making. These costs may not be recorded in the books of account.

Some examples include: marginal, imputed, opportunity, relevant, irrelevant, sunk costs, etc. Check Your Progress 3.

Which method of costing

is applied in mines, quarries, brick kilns, steel production, flour mills, etc.? 4.

Name the technique of costing which is the complete opposite of marginal costing. 5. What are committed costs?

Cost Concepts

NOTES Self-Instructional Material 27 2.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS 1.

Examples of indirect materials used in material cost include pins, screws, thread, coal, lubricating oil and grease, etc. 2.

The aggregate of

direct material cost, direct labour cost and direct expenses

is prime cost. 3.

Single, output or unit costing

is applied in mines, quarries, brick kilns, steel production, flour mills, etc. 4.

Total absorption costing is the technique of costing which is the complete opposite of marginal costing. 5.

Committed costs are those costs that are incurred in maintaining physical facilities and managerial set up. 2.5

SUMMARY ?

A cost is composed of three elements, i.e., material, labour and expense. Each of these elements may be direct or indirect. ?

According to CIMA, London,

material cost is 'the cost of commodities supplied to an undertaking.'

Material cost

includes cost of procurement, freight inwards, taxes, insurance, etc., directly attributable to the acquisition. ?

Labour cost means the payment made to the employees, permanent or temporary, for their services.

CAS-I of ICAI. It includes salaries, wages, commission and all fringe benefits like P.F. contribution, gratuity, ESI, overtime, incentive bonus, wages for holidays, idle time, etc. ?

Overheads are

83%

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the aggregate of indirect material cost, indirect labour cost and indirect expenses. ?

Cost sheet is a statement which is

prepared periodically to provide detailed cost of a cost centre or cost unit. ?

The method of costing to be applied in a particular concern depends upon the type and nature of manufacturing activity.

Basically, there are two methods of costing: 1. Job costing or job order costing 2. Process costing

All other methods are variations of either job costing or process costing. ? Techniques of costing include: standard costing, budgetary control, marginal costing, total absorption costing and uniform costing.

Cost Concepts NOTES Self-Instructional 28 Material ? Classification

of costs include the following: direct costs and indirect costs, fixed and variable costs, committed and discretionary costs, product and period costs, controllable and non-controllable costs, historical and predetermined costs and normal and abnormal costs. 2.6 KEY WORDS ? Elements of Cost:

It includes the material, labour and expense ?

Cost Unit: It is a form of measurement of volume of production or service ?

Cost Centre: It

refers to a section of the business to which costs can be charged ?

Cost Ascertainment:

It refers to the methods and processes employed in ascertaining costs 2.7

SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer Questions 1. Write a short on material costs. 2. Briefly explain overheads. 3. What does a cost sheet show apart from the total cost? 4. Why is said that cost ascertainment has very less utility? 5. State the uses of cost estimation. Long Answer Questions 1. Distinguish between variable, semi-variable and fixed costs. 2. State the important ways of classification of cost and discuss each of them in detail. 3. Discuss, in detail, the major methods or systems of costing. 4.

What are the different techniques of costing? 2.8 FURTHER READINGS

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Cost

Accounting for Material Cost Control NOTES Self-Instructional 30 Material UNIT 3 COST ACCOUNTING FOR MATERIAL COST CONTROL Structure 3.0 Introduction 3.1 Objectives 3.2 Need for Material Cost Control 3.3 Techniques of Inventory Control 3.3.1 Stock Levels 3.3.2 Economic Order Quantity or EOQ (Reorder Quantity) 3.3.3 Purchase Control 3.3.4 Stores Control 3.4

Answers to Check Your Progress Questions 3.5 Summary 3.6 Key Words 3.7 Self Assessment Questions and Exercises 3.8 Further Readings 3.0 INTRODUCTION

The term 'material' refers to all commodities that are consumed in the process of manufacture.

It is defined as 'anything that can be stored, stacked or stockpiled.'

Materials are classified into 'direct' materials and 'indirect' materials. Direct

materials are those whose consumption may be identified with specific production units and which usually become a part of the finished product.

Direct materials include not only the raw materials entering at the start of the production but all of the following: (a) Component parts used in a product, e.g., tyres and tubes in a car or picture tube in a television set. (b) Any material used in production but wholly consumed in the production process, e.g., fertilizer used in growing plants. (c) Any primary packing material, i.e., any container sold with the final product, e.g., cans for tinned food and drink, bottles for beer, etc. Indirect materials are those which cannot be conveniently identified with individual cost units. Examples are coal, grease and oil, soap and sandpaper.

The term 'inventory' is used to cover the stocks of raw materials, components, work-in-progress and finished goods.

It has been defined by the Accounting Principles Board as 'the aggregate of those items of tangible personal property which (i) are held for sale in the ordinary course of business; (ii) are in the process of production for such sales; or (iii) are to be currently consumed in the production of goods or services to be available for sale.'

Cost Accounting for Material Cost Control NOTES Self-Instructional Material 31

In this unit, you will learn the need for material cost control, and the techniques of material cost control. 3.1

OBJECTIVES After going through this unit, you will be able to: ? Discuss the

need for material cost control ? Explain the

concept of purchase control ? Discuss the idea of stores control ? Examine the technique of stock levels ? Describe EOQ analysis 3.2 NEED FOR MATERIAL COST

CONTROL

No cost accounting system can become effective without proper and efficient control of materials.

This is

so because quite often

material is the single largest element of cost and as such, an efficient system of material control leads to a significant economy in the total cost.

Material is as much cash as cash itself and

any theft, waste and excessive use of materials leads to immediate and direct financial losses.

Where slack methods exist, it is easy for such losses to pass unnoticed. Meaning and

Definition:

Material

or inventory control may be defined as '

systematic control and regulation of purchase, storage and usage of materials in such a way

so as to maintain an even

flow of production, at the same time avoiding excessive investment in inventories.

Efficient material control cuts out losses and wastes of materials that otherwise pass unnoticed.'

Thus

an efficient system of material control should be comprehensive enough to cover purchase system, storage system, issue to production and determination of stock levels for each item of material.

Objectives of Material or Inventory

Control The broad objectives of material control are listed below: 1. No under-stocking: Under-stocking inevitably leads to materials running out of stock at some time or the other. Shortage of material may arise at a time when they are urgently needed and production may then be held up. The delay or stoppage in production due to non-availability of materials is very costly and results in loss of profits. 2. No over-stocking: Investment in materials must be kept as low as possible considering the production requirements and the financial resources of the business. Over-stocking of materials locks up capital and causes high storage costs, thereby resulting in adverse effect on profits. This may also result in loss due to obsolescence.

Cost Accounting for Material Cost

Control NOTES Self-Instructional 32 Material 3.

Economy in purchasing: The purchasing of materials is a highly specialized function.

By purchasing materials at the most favourable prices, the purchaser is able to make a valuable contribution to the reduction in cost. 4.

Proper quality: While purchasing materials, due consideration should be given to the quality. It is no use purchasing materials of inferior quality or very superior quality. For each type of product, there is a particular type of quality of material which is needed and that quality alone should be purchased. 5. Minimum wastage: In order to minimize the loss of materials, proper storage conditions must be provided to different types of materials. Losses of materials occur due to deterioration, obsolescence, pilferage and theft and evaporation. All round efforts should be made to keep these losses to the minimum. 6. Information about materials: Not only should materials be available when required, there should also be a system to give complete and up-to-date accounting information about the availability of materials. Sometimes inadequate information about availability of materials may cause new purchases to be made of materials already in stock.

Essential Requirements or Principles of Inventory Control

Ideally, material control must ensure that the following requirements are fully met: 1. There should be proper coordination and cooperation between various departments dealing in materials, viz., Purchasing Department, Stores Department, Receiving and Inspecting Department, Accounting Department, etc. 2. There should be a central purchasing department under the control of a competent and expert purchase manager. 3. There should be proper classification and codification of materials. 4. Material requirements should be properly planned. 5. The perpetual inventory system should be operated so that up-to-date information is available about the quantity of material in stock. 6. Adequate records should be introduced to control materials during production and the quantities manufactured for stock. 7. The storage of all materials should be well planned, subject to adequate safeguards and supervision. 8. The various stock levels like minimum, maximum, etc., should be fixed for each item of material. 9. Purchases of materials should be controlled through budgets. 10. An efficient system of internal audit and internal check should be operated so that all transactions involving materials are checked by reliable and independent persons.

Cost Accounting for Material Cost Control NOTES Self-Instructional Material 33 11. There should be regular reporting to management regarding purchases, issues and stock of materials. Special reports should be prepared for obsolete items, spoilage, returns to suppliers, etc.

Techniques of Inventory Control Various techniques commonly used for inventory control are listed below: 1. ABC technique 2. Stock levels—Minimum, maximum and reorder levels 3. Economic order quantity (EOQ) 4. Proper purchase procedure 5. Proper storage of materials 6. Inventory turnover ratio to review slow and non-moving materials 7. Perpetual inventory system 8. Fixation of material cost standards (Used in Standard Costing) 9. Preparation of material budgets (Used in Budgetary Control)

We will

only discuss stock levels, economic order quantity, purchase control (proper purchase procedure) and stores control (proper storage of material) in the next section.

Check Your Progress 1. What are the factors which must be covered by an efficient and comprehensive system of material control? 2. What does over-stocking lead to? 3.3

TECHNIQUES OF INVENTORY CONTROL In this section, you will learn about the major techniques

of inventory control. 3.3.1

Stock

Levels In order to guard against under-stocking and over-stocking, most of the large companies adopt a scientific approach of fixing stock levels.

These levels are: (i) maximum level; (ii) minimum level; (iii) reorder level; and (iv) reorder quantity. By adhering to these levels, each item of material will automatically be held within appropriate limits of control. These levels are not permanent and must be changed to suit changing circumstances. Thus, changes will take place if consumption of material is increased or decreased or if—in the light of a review of capital available, —it is decided that the overall inventory must be increased or decreased. Modern inventory management makes use of operations research and statistical techniques in fixing stock levels. However, given below is the description of various levels along with formulae that are commonly used in their computations.

Cost Accounting for Material Cost Control NOTES Self-Instructional 34 Material

Factors: Some of the factors which influence stock levels are: 1.

Anticipated rate of consumption 2. Amount of capital available 3. Availability of storage space 4. Storage/warehousing costs 5. Procurement costs 6.

Reliability of suppliers 7. Minimum order quantities imposed by suppliers 8. Risk of loss due to: (

a) obsolescence; (b) deterioration; (c) evaporation; and (d) fall in market prices

Maximum Level This is that level above which stocks should not normally be allowed to rise.

The maximum level may, however, be exceeded in certain cases, e.g., when unusually favourable purchasing condition arise.

It is computed by the following formula:

Minimum level = $\frac{\text{Minimum consumption} \times \text{Reorder period}}{\text{Reorder quantity}}$

level quantity

The following factors are taken into account in setting this level: 1. Rate of consumption of material 2. Risk of obsolescence and deterioration 3. Storage space available 4. Costs of storage and insurance 5. Availability of funds needed 6. Seasonal considerations, e.g., bulk purchases during off-season at low prices 7. Reorder quantity 8.

Restrictions imposed by government or local authority in respect of certain materials in which there are inherent risks of fire, explosion, etc. The idea of setting maximum stock level is to ensure that capital is not unnecessarily blocked in stores and also to avoid loss due to obsolescence and deterioration.

Minimum Level It is that level below which stock should not normally be allowed to fall. This is essentially a safety stock and is not normally touched.

In case of stock falling below this level, there is a risk of stoppage in production and thus top priority should be given to the acquisition of fresh supplies. It is computed by the following formula:

Cost Accounting for Material Cost Control NOTES Self-Instructional Material 35

Normal level = $\frac{\text{Normal consumption} \times \text{Reorder period}}{\text{Reorder quantity}}$

In fixing this level, the following factors are considered: 1. Rate of consumption. 2. The time required to acquire fresh supplies under top priority conditions so that stoppage in production can be avoided. Reorder Level or Ordering

Level This is that level of material at which purchase requisition is initiated for fresh supplies.

This level is fixed somewhere above minimum level. This is fixed in such a way that by reordering when materials fall to this level, then in the normal course of events, new supplies will be received just before the minimum level is reached. Its formula is:

Reorder level = $\frac{\text{Maximum level} \times \text{Reorder period}}{\text{Reorder quantity}}$

The following factors are considered in fixing this level: 1. Rate of consumption of the material 2. Minimum level 3.

Delivery time—i.e., the time normally taken from the time of initiating a purchase requisition to the receipt of materials.

This is also known as lead time 4. Variations in delivery time Danger Level Sometimes

purchased materials are not received in time and stock level goes below the minimum level.

In order to meet such a situation a danger level is fixed.

Danger level is a

level at which normal issues are stopped and materials are issued for important jobs only.

This level is generally fixed

somewhat below the minimum level. When stock reaches danger level, urgent action is needed for the replenishment of stock so that stoppage in production can be avoided. Purchasing materials on an urgent basis results in higher purchasing cost. Its formula is:

Danger level = $\frac{\text{Maximum level} \times \text{Reorder period}}{\text{Reorder quantity}}$

Average Stock Level This

is computed as follows:

Average stock level = $\frac{1}{2} (\text{Minimum level} + \text{Maximum level})$

Alternatively, Average stock level = $\frac{1}{2} (\text{Minimum level} + \text{Reorder quantity})$

Lead time is the time interval between the time when an item reaches reorder level and a fresh order is placed, to the time of actual receipt of materials. When

Cost Accounting for Material Cost Control NOTES Self-Instructional 36 Material purchased materials are received, the maximum level is reached. As materials are consumed, the stock level starts coming down. Fresh supplies are received when

stock reaches minimum level.

Illustration 3.1 Two materials

A

and B are used as follows:

Minimum

usage 50

units per week each Maximum usage 150

units per week each

Normal

usage 100 units per week

each

Reorder

quantity

A—600 units, B—1000 units Delivery period A—4 to 6 weeks, B—2 to 4 weeks.

Calculate

various stock levels. Solution: Reorder level= Maximum consumption × Maximum reorder period A =150 units × 6 weeks = 900 units B =150 units × 4 weeks = 600 units

Minimum level = ? ? ? ? ? ? ? Reorder Normal Normal delivery level consumption period

A =900 – (100 units × 5 weeks) = 400 units B =600 – (100 units × 3 weeks) = 300 units Average reorder period has been taken as normal reorder period.

Maximum level = ? ? ? ? ? ? ? ? Reorder Reorder Minimum Minimum level quantity consumption delivery time

A = 900

units + 600 units – (50 units × 4 weeks) = 1,300 units B = 600 units + 1,000 units – (50 units × 2 weeks) = 1,500 units

Average stock level = $\frac{1}{2}$ (Minimum level +

Maximum level) A = $\frac{1}{2}$ (400 units + 1,300 units) = 850 units B = $\frac{1}{2}$ (300 units + 1,500 units) = 900 units 3.3.2 Economic

Order Quantity

or EOQ (

Reorder Quantity)

Reorder quantity is the

quantity for which order is

placed when stock reaches reorder level. By fixing this quantity, the purchaser doesn't have to recalculate the quantity to be purchased each time he orders for materials.

Reorder quantity is known as Economic Order Quantity because it is the quantity which

is most economical to order. In other words, economic order

quantity is that size of the order which

gives maximum economy in purchasing any material

and ultimately contributes towards maintaining the material at the optimum level and at minimum cost.

Cost Accounting for Material Cost Control NOTES Self-Instructional Material 37

While setting economic order quantity, two types of costs should be taken into account: 1.

Ordering cost: This

is the cost of placing an order with the supplier.

Because of

so many factors involved, it is quite difficult to quantify this cost.

It mainly includes the cost of stationery, salaries of those engaged in receiving and inspection, salaries of those engaged in placing orders, etc. 2. Cost of carrying stock:

This is the cost of holding the stock in storage. It includes the following: (a) Cost of operating the stores, (salaries, rent, stationery, etc.) (b) The incidence of insurance cost (c)

Interest on capital locked up in store (d) Deterioration and wastage of materials

Note: At EOQ, ordering cost and cost of carrying stock are equal, i.e., when the total of the two types of costs is the lowest.

The above two types of costs are of opposing nature. If, for instance, an attempt is made to reduce the costs of carrying stock by keeping stocks as low as possible, the cost of ordering will go up because the number of replenishment orders will automatically rise. On the other hand, if in order to save ordering costs, order is placed for a larger quantity at one time, the stock will remain longer in stores and the cost of carrying stock will go up. The problem is, therefore, to balance these two types of costs and the economic order quantity is fixed at a point where the aggregate cost is the minimum.

This is shown in Figure 3.1, in which the line of cost of ordering has been shown sloping downward indicating lower cost when large quantity is purchased and the line representing cost of carrying stock going upward indicating higher costs for holding larger stocks. The economic order quantity, which is the ideal order size, is at a point where total cost curve is at its lowest point. Fig. 3.1 Economic Order Quantity

Cost Accounting for Material Cost Control NOTES Self-Instructional 38 Material

Mathematical Formulae of EOQ The above graphic methods of determining economic order quantity may not provide the most accurate answer.

Economic order quantity can also be calculated with the help of a formula as given below: $EOQ = \sqrt{\frac{2AB}{C}}$

A.B C.S

where EOQ = Economic Order Quantity A = Annual consumption in units B = Buying or ordering cost per order C = Cost per unit S = Storage or carrying cost as a percentage of average inventory

Alternatively, $EOQ = \sqrt{\frac{2AS}{C}}$

A.B S

where S = Storage cost per unit per annum

Illustration 3.2 Estimated requirement for the year 600 units Cost per unit `20 Ordering cost (per order) `12 Carrying cost (% of average inventory) 20% Solution: $EOQ = \sqrt{\frac{2 \times 600 \times 12}{20 \times 20}} = 60$ units

In this illustration, if carrying cost is given as `4 per unit per annum, EOQ will be calculated as follows: $EOQ = \sqrt{\frac{2 \times 600 \times 12}{4}} = 60$

A.B 2 600 12 S 4 ? ? ? = 60

units Tabular Method

Economic order quantity can also be determined with the help of a table prepared for this purpose. This method is particularly used when prices vary according to the quantity to be purchased. A table is prepared to show the various costs for different ordering quantities thus, enabling one to find out the most economic size of the quantity to order, i.e., where the total cost is the least of all. This is illustrated as follows:

Cost Accounting for Material Cost Control NOTES Self-Instructional Material 39

Illustration 3.3: Determine EOQ from the following information using tabular method: Annual consumption – 12,000 units Cost of ordering – `15 per order Cost of material – `1.25 per unit Carrying cost – 20 per cent of average inventory Solution: The following table may be prepared to determine the economic order quantity:

No. of orders per year	Units ordered	Value per order	Ordering cost	Carrying cost	Total cost
1	12,000	15,000	15	1,500	1,515
2	6,000	7,500	30	750	780
3	4,000	5,000	45	500	545
4	3,000	3,750	60	375	435
5	2,400	3,000	75	300	375
6	2,000	2,500	90	250	340
7	1,714	2,142	105	214	319
8	1,500	1,875	120	188	308
9	1,333	1,667	135	167	302
10	1,200	1,500	150	150	300
11	1,091	1,364	165	136	301
12	1,000	1,250	180	125	305
13	923	1,154	195	115	310
14	857	1,071	210	107	317
15	800	1,000	225	100	325

The above table shows that 1,200 units is the ideal size of the order because total cost at this level is the least of all. This means the number of orders per year should be ten. Other order quantities (more than or less than 1,200 units) are not so economical because total cost is higher than this level. The result of this table can be verified with the help of mathematical formula as shown below: $EOQ = \sqrt{\frac{2 \times 12,000 \times 15}{20 \times 1.25}} = 1,200$ units

A.B 2 12,000 15 = C.S 1.25 20% ? ? ? = 1,200

units 3.3.3

Purchase Control

Purchasing is the function of buying raw materials, general supplies, tools, office stationery and other items.

The essentials of efficient purchasing are

right quantity, right quality, right time, right price, right source and delivery at the right place. Just-in-time (JIT)

Purchasing Just-in-time purchasing is the purchase of materials immediately before these are required for use in production. According to CIMA, London JIT purchasing is

Cost Accounting for Material Cost Control NOTES Self-Instructional 40 Material

‘matching receipts of materials closely with usage so that raw material inventory is reduced to near zero level.’

The purpose of JIT purchasing is to reduce stock levels to the minimum through creating closer relationship with suppliers and arranging frequent deliveries of materials in smaller quantities. It results in enormous savings in storage costs, material handling costs, spoilage, obsolescence etc. An important effect of JIT purchasing is that with frequent purchasing the issue price is likely to be closer to market prices. In order to save on ordering costs, long term agreements may be entered into with suppliers. Centralized and Decentralized Purchasing Broadly speaking, purchase function may be organized in two ways, i.e., centralized purchasing and decentralized purchasing. Centralization: Centralization of purchasing means that all purchases are made by a single purchase department.

Head of this department is designated as Purchase Manager or Chief Buyer. Decentralization: In decentralized purchasing, each branch or department makes its own purchases. If the branches or plants are located at different places,

the decentralized purchasing can better meet the situation by making purchases in the local market by plant or branch managers. Advantages of Centralized Purchasing 1.

Specialized

and expert purchasing staff can be concentrated in one department. 2. A firm policy can be initiated which may result in favourable terms of purchase, e.g., higher trade discount

or

easy terms of payment 3. Standardization of quality of raw material is facilitated. 4. Better control over purchasing is possible because reckless buying by various individuals is avoided. Keeping all records of purchase transactions at one place also helps in control. Disadvantages of Centralized Purchasing 1. The creation and maintenance of a special purchasing department leads to higher administration costs which small concerns may not be in a position to afford. 2. Centralized purchasing is not suitable for plants or branches located at different places which are far apart.

Purchase Procedure Although the details of a purchase procedure may differ from firm to firm, the important steps in purchasing and receiving of materials are as follows, assuming that purchases are centralized:

Cost Accounting for Material Cost Control NOTES Self-Instructional Material 41 1.

Purchase Requisition Purchases of materials are initiated through purchase requisitions. A purchase requisition is a formal request by the head of a department or an authorized officer to the purchase manager to purchase the specified materials.

Such requisitions are received from certain authorized persons as follows: (i)

Storekeeper When materials reach ordering level, the storekeeper should initiate purchase procedure. (ii) Production planner for special materials required for the manufacture of a new product. (iii) Plant engineer for repairs and maintenance materials. (iv) Department heads (e.g., office manager) for any materials required for his department, like filing cabinets, stationery and office sundries. Purposes: A purchase requisition serves the following purposes: 1. It initiates the purchase and sets the purchasing process in motion. 2. It provides a written record of details like quantities, specification, etc., of materials to be purchased. 3. It provides dates for reference, e.g., date when materials are required. Dates are particularly important in case responsibility for stoppage in production due to shortage of materials is to be determined. Generally two copies of purchase

requisition are prepared. The original copy is sent to the purchasing department and carbon copy is retained and filed by the requisitioner for his own reference. (A note of caution: Purchase Requisition should not be confused with Stores or Materials Requisition). 2.

Selection of Suppliers When the purchasing department receives a duly authorized purchase requisition, a source of supply

has to be selected. The purchase department generally maintains a list of suppliers for each type of material and selects a particular supplier after inviting tenders.

The important rule is to buy the best quality materials at the lowest possible price after giving due consideration to delivery dates and other terms of purchases. Purchases should be made from dependable sources of supply and ethical standards should be maintained in dealing with suppliers. In many industries, long term contracts are entered into with suppliers.

For example,

a car manufacturer may contract ahead for the supply of tyres and tubes for a year's requirement at a time. Such an arrangement has the advantage of not having to keep large stocks if the continuity of supply can be relied upon.

Moreover, the supplier gets a regular customer and may offer favourable terms. Periodic withdrawals against the contract are made by raising a purchase order. 3.

Purchase Order and Follow-up When the supplier has been selected, the most common procedure is the preparation of a purchase order. The purchase order is the form used by the

Cost Accounting for Material Cost Control NOTES Self-Instructional 42 Material

purchasing department authorizing the suppliers to supply the specified materials at the price and terms stated therein.

A purchase order should be carefully prepared as it forms a basis of legal contract between the parties concerned. For this reason, authority to sign purchase orders should also be restricted to selected responsible officials. Large companies generally prepare five copies of the purchase order.

The original is sent to the supplier. Second copy is retained by the purchase department for its own file. Third copy is sent to the receiving department

as an advance intimation to expect the materials. Fourth copy is sent to the cost accounting department for entry in the ordered column of the appropriate stores ledger account. The last copy is sent to the department requisitioning the material as an intimation of the order and expected date of receipt of materials. It is very important to follow up purchase orders so as to ensure timely delivery. Lack of follow-up measures may cause delay in arrival of materials resulting in stoppage in production for want of materials.

4. Receipt of Materials All incoming materials should be received by the Receiving Department. This department performs the functions of unpacking the goods received and verifying their quantities and conditions. The quantity is checked against the purchase order copy and the supplier's advice note which is normally received along with the goods. Full particulars of the goods received are entered in a Goods Received Note. Goods Received Note serves the following purposes: 1. It informs the storekeeper and the requisitioner of the receipt of materials. 2. It notifies the accounting department that the materials have been received and that a voucher can be prepared. 3. When it includes columns of cost, it can serve as a source of entry in the stores ledger. Original copy of the Goods Received Note is sent to the purchase department to be marked completed. Second copy is sent to the storekeeper or the requisitioner along with the goods. Third copy is sent to the accounting department

for entry in the stores ledger and the last copy is retained by the receiving department for its own file.

5. Inspection and Testing of Materials Goods received should be inspected for quality to ensure that

they comply with the specifications stated on the purchase order. Where technical or laboratory inspection is necessary, the goods are passed to a laboratory which will provide a report on the quality of goods.

An inspection report is prepared to show the results of the inspection.

This report is either prepared separately or incorporated in the Goods Received Note.

In either case, the report is forwarded to the purchasing department.

Cost Accounting for Material Cost Control NOTES Self-Instructional Material 43 6.

Return of Rejected Materials Where materials received are damaged or are not in accordance with the specifications, these are usually returned to the supplier along with a Debit Note, informing him that his account has been debited with the value of materials concerned.

When such a claim is accepted by the supplier, he signifies his acceptance by

the issue of a Credit Note. The rejected materials may be returned to the supplier immediately or they may be held pending his instructions. This Debit Note may be prepared by the purchase department on the basis of the inspection report. Original copy is sent to the supplier. One copy is sent to accounts department for adjustment entry and one copy is retained for purchase department file.

7. Passing Invoices for Payment When the invoices are received by the purchasing department, the process of assembling the business papers connected with each purchase and preparation of voucher begins.

Invoices are numbered serially and entered in the Invoice Register.

The following documents are assembled in support of the invoice: (a) Purchase Order; (b) Goods Received Note; (c) Inspection Report, if not incorporated in the Goods Received Note and (d) Debit or Credit Note. After comparing these documents with the invoice, if it is found that

the invoice is in order, the purchase manager will sign it and pass it to the accounts department

for payment. All calculations are checked before a voucher authorizing payment is prepared. All related documents like Purchase Order, Goods Received Note are marked with the invoice number to preclude the passing of a possible duplicate invoice.

Purchase Price The invoice received from the supplier provides a base figure of purchase price. The following adjustments have to be made in this figure to arrive at the real material cost.

Quantity discount: This is an allowance made by the supplier to the purchaser to encourage large orders. The discount often varies according to the size of the order, i.e., the larger the quantity ordered, the higher is the discount, within fixed limits. Quantity discount is allowed by a supplier as a measure of the savings in his cost which arise from the production and distribution on a large scale. Part of these savings enjoyed by the supplier is passed on to the purchaser in the form of quantity discount. The amount of the quantity discount is deducted from the purchase price to arrive at the material cost.

Trade discount: This is an allowance made by the supplier to a purchaser who has to re-sell the material, e.g., discount allowed by the manufacturer to the wholesaler. The idea is to cover the expenses (e.g., storage, re-packing) and profit of the dealer who is providing a service to help the original supplier to distribute

Cost Accounting for Material Cost Control NOTES Self-Instructional 44 Material

his goods. This discount is also deducted from the purchase price to arrive at the material cost. Cash discount: This discount is allowed by the supplier to a purchaser to encourage prompt payment of invoice, e.g., 2% discount may be allowed if payment is made within 30 days and 4% discount if payment is made within 7 days. As cash discount is a form of interest on capital, its treatment is a subject of debate among cost accountants. Generally, it is considered a financial and non-costing item and thus is not included in cost accounts. Sales tax and other levies: Items, like sales tax, excise duty, customs duty and octroi, should be added to the purchase price. Transport charges: These include sea, land and air freight, dock charges, insurance, etc. on materials purchased. Sometimes the purchase price quoted by the supplier includes all these charges, but where the price does not include these charges, these should be added to the purchase price. Where it is impracticable to do so (e.g., where such costs are too small or invoices are received late) these may be charged as factory overheads. Cost of containers: The supplier may or may not charge separately for containers. If no such charge is made, no adjustment is required in the purchase price. However, if containers are separately charged, all such costs should be included in the purchase price i.e. (i) the cost of containers if these are not returnable; and (ii) the difference between the cost of container and the amount refunded when container is returned, where containers are returnable. 3.3.4

Stores Control Storekeeping is the function of receiving of materials, storing them and issuing these to workshops or departments. As a substantial amount of a company's working capital is invested in stores, storekeeping acquires special importance.

The stores department is under the control of a person known as 'storekeeper' or stores superintendent. He should be a man of undoubted integrity, suitably trained and experienced and well versed in the principles of good storekeeping. Objectives of Good Storekeeping Good storekeeping should achieve the following objectives: 1. Protection of materials from losses due to fire, evaporation, obsolescence, etc. 2. Avoiding over-stocking and under-stocking 3. Economical use of storage space 4. Up-to-date stores records 5. Immediate location of materials required 6. Facilitating perpetual inventory

Cost Accounting for Material Cost Control NOTES Self-Instructional Material 45 7. Speedy receipts and issues of stores 8. Minimize storage cost Functions and Duties of Storekeeper Various functions and duties of a storekeeper are as follows: 1. Maintaining materials in a tidy manner 2. Proper maintenance of records of materials received, issued to production and in stock 3. Accepting materials into the stores after having ascertained that the delivery complies with specifications detailed on Goods Received Note 4. Issuing materials against duly authorized Stores Requisitions 5. Requisitioning further supplies from the purchasing department when reorder level is reached on any material 6. Preventing the entry of unauthorized persons in the storeroom 7. Periodic comparison of bin card balances with physical quantities in the bins 8. Advising management on obsolete and slow-moving stocks

Stores Organization There are mainly two types of stores organization, i.e., central stores and departmental sub-stores. From control point of view, it is ideal to have one central store for receiving and issuing all materials. However, this is not always practicable because in large factories, where there are many production departments, the location of the central store may not be convenient to all such departments. Thus, where it is not advantageous to keep central stores, departmental sub-stores should be maintained. It is recommended that control over all sub-stores should be centralized and storekeeper of each sub-store should be responsible to the chief storekeeper. This will ensure a uniform policy of purchasing, storing

and issuing materials. Imprest System Sometimes large organizations use the imprest system of stores management. This is similar in operation to imprest system of petty cash.

Under this system, a number of sub-stores exist, each drawing their supplies from the central store. Each sub-store is given, as a commencing stock, sufficient supplies for a little more than the re-stocking period. At the end of the period, the storekeeper of each sub-store will requisition from the central stores the number of articles required to bring the stock upto the predetermined quantity.

For example, let us assume the imprest amount set for a material is 400 kgs. During the week ending on 24 February, issues of materials have reduced the

Cost Accounting for Material Cost Control NOTES Self-Instructional 46 Material stock to 140 kgs. The sub-storekeeper will issue a requisition from the central store for 260 kgs to ensure that at the beginning of the next week, 400 kgs are in stock. This system combines the advantages of central buying and storing with the benefits of having stocks conveniently available at several issuing points. The system also helps in exercising an excellent control over sub-stores as over-issues will not be re-imbursed and the sub-storekeeper will have to explain discrepancies, if any. Classification and Codification of Materials Names and descriptions of materials are often long and vague. In order to avoid length and ambiguity in description and names of materials, a symbol may be assigned to each item of material which is known as a code.

Codification is the procedure of systematic assignment of symbols for each item of store.

Such codes may be

either numeric, alphabetic or a combination of numerical and alphabetical symbols.

Such codes are secret and short names of materials. The codes being shorter, considerable time and effort may be saved by substituting a code for a longer name and or a cumbersome description.

Classification of materials refers to grouping of materials according to their nature in suitable categories. For example, copper, iron, aluminium may be classified as metals; items like soap, cotton waste and lubricating oil, may be classified as consumable stores;

all forms of tools including jigs and fixtures may be classified as tools. Advantages: The advantages to be derived from the use of a satisfactory system of classification and codification of materials are as follows: 1. Ambiguity in description is avoided as a particular code can refer to only one type of item 2.

Clerical effort is reduced as length in description is minimized 3.

Secrecy of materials used in production is maintained 4. Coding is essential in mechanized accounting Basic Principles of Coding While assigning codes, the following principles should be kept in mind: 1. Exclusive: Each code number should relate to only one type of material and there should be no duplication. 2. Clear: The code must be clear and should identify the material without any ambiguity. 3. Brief: Codes should be brief because long codes take longer to write and are prone to error. 4. Elastic: The code should be such that new materials can be added easily and logically.

Cost Accounting for Material Cost Control NOTES Self-Instructional Material 47 5. Mnemonic: As far as possible, codes should be easier to remember, such as, HCW for Hard Copper Wire. Systems of Coding 1. Numerical and Decimal: In this method, a number is allotted to each item. Sub-groups are indicated by decimals. For example, in a foundry, the following codes may be assigned: Coal 31 Wood 32 Copper 33 Steel 34 Aluminium 35 Bronze 36 Further, physical characteristics can be indicated in the code by decimals. This is shown below for copper, of which the numerical code as shown above is 33. Copper Sheets 33.1 Copper Bars 33.2 Copper Granules 33.3 Copper Wire 33.4 Copper Tubes 33.5 Sub-division of, say, copper bars into various grades may be coded as follows: Copper bar grade 1 33.2.1 Copper bar grade 2 33.2.2 Copper bar grade 3 33.2.3 This numerical method allows a wide range and is, therefore, most suited where the number of items is very large. 2. Alphabetical or Mnemonic: In this method, each item of store may be denoted by a combination of alphabets. As alphabets represent the first sound of description of materials, it becomes easy to remember the codes. The system is, thus, also known as 'Mnemonic'. Examples: Mild Copper Bar MCB Cast Iron Sheet CIS Stainless Steel Wire SSW 3. Alpha-numerical: This is a combination of numerical and alphabetical methods. Examples: Mild Copper Bar of 6" Length MCB6 Toughened Steel Tubes of 3/4" diameter TST34 Brass Strips of 1/4" thickness BS14

Cost Accounting for Material Cost Control NOTES Self-Instructional 48 Material The codes of materials should appear on all documents relating to the movement and use of materials and should be marked against the appropriate bins. As a note of caution, codes must be handled with extreme care. If a slight mistake is made in quoting the code, the entire work order may have to be scrapped, entailing considerable loss to the factory. Stores Records The stores records are of two types: 1. Perpetual Inventory Records: These records show the movement of stores, i.e., the receipt of materials, issues of materials to production department and also balance in stock. Bin card and stores ledger are the two basic perpetual inventory records. 2.

Documents:

The documents are used to authorize movement of materials into and out of stores. These documents include Goods Received

Note, Bill of Materials, Materials Requisition Note, Materials Return Note and Material Transfer Note.

Bin Card (Stock Card)

A bin is a container in which material is kept. Separate bin cards are maintained by the storekeeper for each item of material in store. The bin cards show the details of receipts and issues of materials and the balance in stock at any time. This record is of immense help to the storekeeper in controlling the stock position. A bin card is attached to the bin, drawer or any other container in which material is stored. An entry is made at the time of each receipt or issue and the new balance in stock is calculated. All these entries of receipts and issues are supported by documents, such as Goods Received Note, Materials Return Note, Stores Requisition Note, etc. Alternatively, bin cards are kept on a table in trays.

A bin card is a quantitative record of receipts, issues and closing balances of material items in store. It does not contain information about the prices of materials. Two Bin System: In this system, two bins are maintained for each item of material. One bin constitutes the main or the regular bin from which materials are issued and the other bin contains the minimum stock from which issues are made only when stock in the regular bin is exhausted. At the time of stock verification, it is usually sufficient to verify stock in the regular bin as the stock in the minimum stock bin is already known. The idea of two bin system is to provide automatic information about reaching minimum stock level so that issue of materials for regular production is stopped. At this stage, materials are issued only for urgent orders till fresh supplies of materials are received.

Cost Accounting for Material Cost Control NOTES Self-Instructional Material 49 Illustration 3.4: The following are the receipts and issues of material X in a factory during December 2009. Dec.1 Opening stock 200 kgs Dec.5 Received from supplier S 1 400 kgs (GRN No. 448) Dec.8 Issued to production department 240 kgs (S.R. No. 883) Dec.10 Issued to production department 160 kgs (S.R. No. 897) Dec.12 Received from supplier S 2 500 kgs (GRN No. 455) Dec.15 Issued to production department 400 kgs (S.R. No. 912) Dec.16 Received from supplier S 3 250 kgs (GRN No. 461) Dec.19 Received from supplier S 1 500 kgs (GRN No. 462) Dec.21 Issued to production department 250 kgs (S.R. No. 940) Dec.24 Issued to production department 260 kgs (S.R. No. 950) Dec.27 Issued to production department 340 kgs (S.R. No. 974) (GRN denotes Goods Received Notes. SR denotes Stores Requisition). The minimum stock level of material X is 200 kgs. Reorder level is 350 kgs and reorder quantity is 500 kgs. Code No. of material is MN 240. Prepare a Bin Card No. 148 for material X with all necessary details showing the transactions in December 2009. Solution: BIN CARD Bin No. 148 Min. Level 200 kgs Description X Reorder Level 350 kgs Code No. MN 240 Reorder Qty 500 kgs Stores Ledger Folio: Date Receipts Issues Balance Stock Verifi- cation 2009 Ref. No. Quantity Ref. No. Quantity Quantity (GRN No.) kgs (SR No.) kgs kgs Dec. 1 — — — — 200 Dec. 5 448 400 — — 600 Dec. 8 — — 883 240 360 Dec. 10 — — 897 160 200 Dec. 12 455 500 — — 700 Dec. 15 — — 912 400 300 Dec. 16 461 250 — — 550

Cost Accounting for Material Cost Control NOTES Self-Instructional 50 Material Dec. 19 462 500 — — 1,050 Dec. 21 — — 940 250 800 Dec. 24 — — 950 260 540 Dec. 27 — — 974 340 200 Stores Ledger

The stores ledger is maintained in the cost accounting department and is one of the basic records for material accounting in a cost system. This record gives the same information regarding stores as bin card and in addition, it gives the monetary values of materials.

Separate ledger folios are maintained in it for each item of material. The ledger sheets may be in loose leaf form or separate bindings may be used for each type of material. There are mainly three sections in this ledger, i.e., receipts, issues and balance, each of these with appropriate sub-divisions showing date, quantity, unit price and total cost. Two additional sections are usually included, i.e., On Order and Materials Reserved columns. The 'On Order' column prevents placing of duplicate orders and 'Reserve' column indicates the materials reserved for a specific job order. Bin Card and Stores Ledger—Distinction The main points of difference between bin card and stores ledger are as follows: 1. Bin card is a record of quantities only, whereas stores ledger records both quantities and money values of materials. 2. Bin card is maintained by the storekeeper, whereas stores ledger is kept by the cost office. 3. Posting in bin card normally takes place before a transaction occurs, while in stores ledger, it is posted after the transaction. Documents Authorizing Movements of Materials Goods Received Note A reference was made to this note in the purchase procedure discussed earlier. It was stated that a copy

of Goods Received Note is sent to the storekeeper along with the materials for his records. The storekeeper uses this document for posting on the receipt side of the bin card. Stores Requisition Note (or Materials Requisition Note) It is a document which is used to authorize and record the issue of materials from store. The storekeeper should issue materials on the presentation of duly authorized stores requisition note.

It should be appreciated that this is a key document in virtually all costing systems and serves the dual purpose of: (a) authorizing the storekeeper to issue material (b) providing a written record of usage of materials

Cost Accounting for Material Cost Control NOTES Self-Instructional Material 51 A separate requisition may be prepared for each item of material or a single requisition may be prepared to cover the issuance of a number of items. The stores requisition note may be prepared in duplicate or triplicate. The original copy is passed to the stores department while duplicate is retained by the department requisitioning materials. When only two copies are prepared, the stores department copy is also routed to the costing department. However, if the requisition is prepared in triplicate, two copies are sent to the stores department out of which it sends one to the costing department for necessary accounting entries. The stores requisition note is used for making entries in bin card, stores ledger, materials abstract, etc.

Bill of Materials (Specification of Materials) It is a master requisition which lists all the materials required for the completion of a job.

So,

a bill of materials is a special form of stores requisition note which is generally used by departments having standard materials requirements or a comparatively fixed list of materials.

For instance, in assembly type production, there will be no variation in the amount of materials which are used. In such a case, much time would be saved if a bill of materials (on which names or codes of all materials required are pre-printed) is used because then only quantity is to be indicated against the code or name of material required. Where the job is of a special nature, a special bill of materials must be prepared and a copy of this is generally passed to the stores department in advance to enable it to arrange for materials not in stock. Materials Return Note

When materials issued are in excess of requirements, the unused materials are returned to stores together with a Materials Return Note. This note is

similar to Materials Requisition Note, but is normally printed in a different colour for easy identification. When materials are received in the stores, these should be placed in appropriate bins and entries made in the bin card. Materials Return Note is usually prepared in triplicate by the stores clerk. One copy is sent to the department that is returning materials. Second copy is sent to the cost office for appropriate entries and the third copy is retained by the stores department for entry in the bin card.

Materials Transfer Note Materials may have to be sometimes transferred from one job to another. This may be either because excess materials were issued to a job and surplus materials are directly transferred to another job or because materials

issued to a less urgent job are transferred to a more urgent job.

When such transfers are not permitted, the surplus materials are returned to the stores and then re-issued to another job. This results in extra transport costs.

Cost Accounting for Material Cost Control NOTES Self-Instructional 52 Material Thus, when materials are bulky, such transport costs may be heavy, which can be avoided if direct transfers are permitted. Where such transfers are permitted, these should be supported by a special document known as a Material Transfer Note. Failure to record transfer of costs would result in incorrect costs of the jobs concerned. Check Your Progress 3. State the risk which may happen in case of stock falling below the minimum level. 4. What does ordering cost includes? 5. List the documents which are assembled in support of the invoice. 6. What are the three sections of a stores ledger? 3.4

ANSWERS TO CHECK YOUR PROGRESS QUESTIONS 1.

An efficient system of material control should be comprehensive enough to cover purchase system, storage system, issue to production and determination of stock levels for each item of material. 2.

Over-stocking of materials locks up capital and causes high storage costs, thereby resulting in adverse effect on profits. 3.

In case the stock falls below the minimum level, there is a risk of stoppage in production and thus top priority should be given to the acquisition of fresh supplies. 4.

Ordering cost

includes the cost of stationery, salaries of those engaged in receiving and inspection, salaries of those engaged in placing order, etc. 5.

The documents which are assembled in support of the invoice are: (a) Purchase order; (b) Goods Received Note; and (c) Inspection Report; if not incorporated in the Goods Received Note and (d) Debit or Credit Note. 6.

The three sections of a stores ledger are: receipts, issues and balances. 3.5

SUMMARY ?

The term 'material' refers to all commodities that are consumed in the process of manufacture. ?

Material

or inventory control may be defined as '

systematic control and regulation of purchase, storage and usage of materials in such a way

so as to maintain an even flow of production, at the same time avoiding excessive

Cost Accounting for Material Cost Control NOTES Self-Instructional Material 53

investment

in inventories. Efficient material control cuts out losses and wastes of materials that otherwise pass unnoticed.' ?

Various techniques commonly used for inventory control are listed below:

o ABC technique o Stock levels—Minimum, maximum and reorder levels o

Economic order quantity (EOQ)

o

Proper purchase procedure o Proper storage of materials o Inventory turnover ratio to review slow and non-moving materials

o Perpetual inventory system o

Fixation of material cost standards (Used in Standard Costing) o Preparation of material budgets (Used in Budgetary Control) ?

In order to guard against under-stocking and over-stocking, most of the large companies adopt a scientific approach of fixing stock levels.

These levels are: (i) maximum level; (ii) minimum level; (iii) reorder level;

and (iv) reorder quantity. ? Reorder quantity is the quantity for which order is placed when stock reaches reorder level. By fixing this quantity, the purchaser doesn't have to recalculate the quantity to be purchased each time he orders for materials.

Reorder quantity is known as Economic Order Quantity because it is the quantity which is most economical to order. ?
Purchasing is the function of buying raw materials, general supplies, tools, office stationery and other items.
The essentials of efficient purchasing are
right quantity, right quality, right time, right price, right source and delivery at the right place. ?

The

details of a purchase procedure generally includes:

purchase requisition, selection of suppliers, purchase order and follow-up, receipt of materials, inspection and testing of materials, return of rejected materials and passing invoices for payment. ?

Storekeeping

or stores control is the function of receiving of materials, storing them and issuing these to workshops or departments. ?

Stores records are of two types: perpetual inventory records and documents. 3.6

KEY WORDS ? Material: It refers to tangible items that are consumed in the process of manufacture ?

Stock Levels: It refers to the scientific approach of fixing stock levels to guard against under-stocking and over-stocking

Cost Accounting for Material Cost Control NOTES Self-Instructional 54 Material ?

Economic Order Quantity (EOQ): It

is that size of the purchase order which gives maximum economy in purchasing ?

Storekeeping: It is

the function of receiving of materials, storing them and issuing these to workshops or departments 3.7

SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer Questions 1. What are the objectives of material or inventory control? 2. State the essential requirements or principles of inventory control. 3. What are some of the factors which influence stock levels? 4. List the advantages and disadvantages of centralized purchasing. 5. What are the objectives of good storekeeping? 6. Write a short note on perpetual inventory records. Long Answer Questions 1.

Explain the inventory control technique of fixing stock levels. 2. Describe the Economic Order Quantity analysis. 3.

Discuss the purchase procedure. 4. What are the different documents authorizing

the movements of materials? 3.8 FURTHER READINGS

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Techniques of Inventory Control NOTES Self-Instructional Material 55 UNIT 4 TECHNIQUES OF INVENTORY CONTROL

Structure 4.0 Introduction 4.1 Objectives 4.2

Inventory Systems 4.3 Pricing Material Issues or Stores Issues 4.4 Treatment of Waste, Scrap, Defectives and Spoilage 4.5

ABC and VED Analysis 4.6

Answers to Check Your Progress Questions 4.7 Summary 4.8 Key Words 4.9 Self Assessment Questions and Exercises

4.10 Further Readings 4.0 INTRODUCTION In the previous unit, you

learn about some of the techniques of inventory control including stock levels, EOQ analysis, purchase control and stores control. A very crucial aspect related to stores and purchase control and central to inventory control is the manner in which the inventory system is maintained. In this unit, you will learn about the types of inventory system with a focus on perpetual inventory system. Further, you will also learn about another significant factor of inventory control, i.e., pricing of stores issues and its methods. Lastly, you will study some other inventory control techniques like Treatment of waste, scrap, defectives and spoilage and ABC and VED analysis. 4.1

OBJECTIVES After going through this unit, you will be able to: ? Discuss the perpetual inventory system ? Explain the

methods of pricing of stores issues ? Describe the treatment of

waste, scrap, defectives and spoilage ? Explain the ABC and VED analysis 4.2

INVENTORY SYSTEMS

There are mainly two inventory systems, viz., Periodic Inventory System and Perpetual Inventory System.

Techniques of Inventory Control NOTES Self-Instructional 56 Material

Periodic

Inventory System Under this system, stock-taking is undertaken at the end of the accounting year.

As the stock taking involves verifying the physical quantities of stores in hand, some firms temporarily suspend plant operations when this is done.

This is because it is rarely feasible to take stocks while production continues. Thus, the annual stock-taking should be

organized well in advance to minimize production hold-ups. Perpetual Inventory System The periodic inventory system has certain serious disadvantages which the perpetual inventory system overcomes. A

perpetual inventory system is defined as 'the

method of recording stores balances after each receipt and issue to facilitate regular checking and obviate closing down for stock-taking.'

Thus, under this system, current balance of stores is always shown in records, any receipts being added to and any issues being deducted from the balance after each transaction. As stated earlier, the records used for perpetual inventory are bin card and stores ledger. Perpetual inventory system is operated by taking the following steps: 1. Reconciliation of bin cards and stores ledger accounts: As we have seen earlier, the records of each item of store are kept simultaneously at two places i.e., bin card and stores ledger, which are the perpetual inventory records. The balance of an item of store as shown in the bin card should agree with that shown in the stores ledger. Any difference between these two figures may be due to: (a) some arithmetic error in working out the balance; and/or (b) wrong posting or non-posting in bin card or stores ledger. The balances of the two records should be reconciled after passing rectifying entries. 2. Continuous stock-taking: In any perpetual inventory system, the book balances as shown by bin cards and stores ledger should agree with actual physical balance in store. This is best done by continuous stock-taking, which is an integral part of the perpetual inventory system. The primary objectives of continuous stock-taking are to confirm that the perpetual inventory system is functioning properly and to bring records into line with the physical stocks. Under this system, a few items of stores are counted daily or at frequent intervals and compared with the bin cards and stores ledger by the stores auditor. Whenever there is a difference between the recorded balance and actual stocks, an enquiry is made and the difference is adjusted in the records to make them correspond with the physical count. It should be noted that perpetual inventory system is not the same as continuous stock-taking. Whereas, perpetual inventory is a system of keeping up-

Techniques of Inventory Control NOTES Self-Instructional Material 57

to-date records, the continuous stock-taking is physical checking of records with actual stock. Continuous stock-taking is only a part of perpetual inventory system. The difference between book balance and physical balance may arise due to: (a) Clerical errors in posting and working out balances in bin card and stores ledger (b) Pilferage and breakages (c) Over or under-issues or wrong issues (d) Variations in weight caused by evaporation or absorption of moisture (e) Breaking the bulk, i.e., issuing materials in smaller quantities (f) Placing materials in the wrong bin Advantages of Perpetual Inventory System: Perpetual inventory system has the following advantages: 1. The system helps in avoiding the long and costly work of physical checking of all the stocks at the end of the year. 2. It also avoids dislocation in production which arises in the case of periodic stock taking at the end of the year. 3. As stock figures are readily available at all times, the Profit and Loss Account and Balance Sheet can be easily prepared at interim periods. 4. The system acts as a moral check on part of the staff of the stores department, and compels them to work honestly and to maintain up-to-date records. 5.

A system of internal check remains in operation all the time. 6. Discrepancies are readily discovered and rectified. This gives an opportunity for preventing a recurrence in future. 7. The system helps in keeping the stocks within the limits decided upon by the management so that excessive working capital is not sunk in the stocks. 8. A detailed and reliable check on stores is obtained. 4.3

PRICING MATERIAL ISSUES

OR STORES

ISSUES When materials are issued from stores

to production department, a question arises regarding the price at which materials issued are to be charged.

This is because

the same type of material may have been purchased in different lots at different times at several different prices.

This means that actual cost can take on several different values and some method of pricing the issue of materials must be selected.

This basic problem of pricing the issue of materials

is illustrated in the following stores ledger account. (Figures are assumed).

Techniques of Inventory Control NOTES Self-Instructional 58 Material

Stores Ledger Account How to price the issue of 900 units on 10 July and how to value the stock of 600 units in hand on this date? Various alternative issue prices that could possibly be charged are `6 per unit, i.e., the price paid on 4 July or `6.50 per unit, i.e., the price paid on 8 July, or `5 per unit, i.e., the price of opening stock or an average of these prices or some other price. The question is

whether it should be the original purchase price or the

current market price on the date of issue or should some other price be used for this purpose. The question is important because the pricing directly affects the amount of profit or loss reported for the accounting period. If the method chosen puts higher value to closing stock, it will result in higher profit, and vice versa, lower valuation of closing stock will result in lower profits.

It should be noted that methods discussed below are methods of pricing the issue of materials and not the methods of physically issuing materials. These methods are discussed and illustrated below.

First-in, First-out (

FIFO) Method This method is based on the assumption that

materials which are purchased first are issued first. It uses the price of the first batch of materials purchased for all issues until all units from this batch have been issued. After the first batch is fully issued, the price of the next batch received becomes the issue price. Upon this batch also getting fully used, the price of the still next batch is used for pricing and so on. In other words, the materials are issued at the oldest cost price listed in the stores ledger account and thus, the materials in stock are valued at the price of the latest purchases. Three important effects of using FIFO method are: (a) Materials are priced at the actual cost (b) Charge to production for material cost is at the oldest prices of materials in stock (c) Closing stock is valued at the latest price paid

Techniques of Inventory Control NOTES Self-Instructional Material 59

Illustration 4.1: From the following transactions, prepare a Stores Ledger Account using FIFO method: Year 2010 1 July

Opening stock 500 units @ `20 each 4 July Purchased GRN 574 400 units @ `21 each 6 July Issued SR 251 600 units 8 July Purchased GRN 578 800 units @ `24 each 9 July Issued SR 258 500 units 13 July Issued SR 262 300 units 24 July Purchased GRN 584 500 units @ `25 each 28 July Issued SR 269 400 units GRN = Goods Received Notes; SR = Stores Requisition (

These transactions have also been used to illustrate other methods of pricing). Solution: FIFO Method Stores Ledger Account 0 * Closing stock is 400 units @ `25 = `10,000.

It should be noted that the assumption of FIFO is only for accounting purpose, i.e., the physical flow of materials need not necessarily be in the order of the flow of cost, though

normally materials would be expected to move out of stock on a FIFO basis because oldest stocks are usually used up first.

Techniques of Inventory Control NOTES Self-Instructional 60 Material

In periods of rising prices, the FIFO method produces higher profits and results in higher tax liability because lower cost is charged to production. Conversely, in periods of falling prices, the FIFO method produces lower profits and results in lower taxes because they are derived from a higher cost of goods sold.

Last-in, First-out (LIFO)

Method This method operates in just the reverse order of FIFO method.

It

is based on the assumption that the last materials purchased are the first materials to be issued. Thus, the price of the last batch of the materials purchased is used first

for all issues until

all units from this batch have been issued,

after which the price of the previous batch of materials purchased is used.

It should be noted that physical flow of materials may not conform to LIFO assumption. Three points should be noted regarding this method: (a) Material issues are priced at actual cost (b) Charge to production for material cost is at latest prices paid (c) Closing stock valuation is at the oldest prices paid and is completely out of line with the current prices

Illustration 4.2: Prepare a Stores Ledger Account, showing pricing of materials on LIFO basis, from the data given in Illustration 4.1. Solution:

LIFO Method Stores Ledger Account *Closing stock is 300 units @ `20 = `6,000 + 100 units @ `25 = `2,500. Total 400 units at `8,500.

In periods of rising prices, profit and tax liability under LIFO would be lower than under FIFO method because cost will be charged at current prices which are at higher level.

Conversely, in periods of falling prices, closing stock

Techniques of Inventory Control NOTES Self-Instructional Material 61

is valued at old prices which are at higher level and thus, profit would also be higher resulting in higher tax liability.

Average Cost Methods These methods are based on the assumption that when materials purchased in different lots are stored together, their identity is lost, and therefore, issues should be charged at an average price. Basically, average prices are of two types— simple average and weighted average. (

a)

Simple Average Method

Simple average price is calculated by adding all the different prices of materials in stock, from which the materials to be priced could be drawn,

by the number of prices used in that total.

This method does not take into account the quantities of materials in stock while calculating the average. Suppose, the following three lots of materials are in stock when material is to be issued: 500 units purchased @ `20 200 units purchased @ `21 700 units purchased @ `22

Simple Average Price = $\frac{20 + 21 + 22}{3} = 21$

While calculating the simple average, the price of lots of materials which are assumed to have been completely issued on FIFO basis are not taken into account.

Illustration 4.3: Prepare Stores Ledger Account by Simple Average Method from the transactions given in Illustration 4.1.

Solution: Simple Average

Price Method

Stores Ledger Account Working

Notes: Various issue prices are computed as follows: On 6 July = $(20 + 21) \div 2 = `20.50$ On 9 July = $(21 + 24) \div 2 =$

$`22.50$ On 13 July = $(24 \div 1) = `24.00$

On 28 July = $(24 + 25) \div 2 = `24.50$

Techniques of Inventory Control NOTES Self-Instructional 62 Material (b)

Weighted Average Method This method gives due weightage to the quantities held at each price when calculating the average price. The

weighted average

price is calculated by dividing the total cost of material

in stock,

from which the material to be priced could have been drawn,

by the total quantity of material in that stock. The

simple formula is that weighted average price at any time is the balance value figure divided by the balance units figure.

Illustration 4.4: From the transactions given in Illustration 4.1, prepare Stores Ledger Account assuming pricing according to Weighted Average Method.

Solution: Weighted Average Method Stores Ledger Account

Notes: The issue prices are calculated as follows: On 4 July $`18,400 \div 900 \text{ units} = `20.444$ On 8 July $`25,333 \div 1,100$

units = $`23.030$ On 24 July $`19,409 \div 800 \text{ units} = `24.261$

The fresh issue rate is determined after each purchase and not at the time of each issue. Thus, as soon as fresh supply is received, a new price is calculated and all issues are then valued at that price until the next supply is received when a new issue price will be calculated.

Replacement Price Method Replacement price is the price at which

materials would be replaced, i.e., the market price on the date of issue. This method is used when it is desired to reflect the current prices in cost. It is most suitable for businesses that buy large quantities of materials well in advance of requirements to take advantage of cheap prices the benefit of which is not desired to be passed on to the customer.

Illustration 4.5: From the transactions given in Illustration 4.1, you are required to prepare a Stores Ledger Account when issues are priced according to Replacement Price Method. Further, assume that the replacement prices are as under: July 6—`22; July 9—`23; July 13—`24; July 28—`26.

Techniques of Inventory Control NOTES Self-Instructional Material 63 Solution: Replacement Price Method Stores

Ledger Account Note: Balance amount is calculated by deducting issue amount from the previous balance amount.

Standard Price Method Standard price is a predetermined price which is fixed for a definite period, such as a year. It takes into account factors like probable trend of prices over that period, market conditions, discounts, etc. Thus, standard price is a notional price and not the actual cost price. Standard prices are fixed for each item of material and where prices of materials fluctuate heavily, standard prices should be fixed for a short period and revised as and when required. Under this method, all receipts are posted in the Stores Ledger Account at actual cost and issues are priced at standard price.

The difference between actual and standard prices, is transferred to Material Price Variance Account. While this method is used mainly in connection with standard costing, it can be employed in practically any other costing system.

Illustration 4.6:

Again

using the transactions given in Illustration 4.1, prepare Stores Ledger Account under Standard Price Method. Assume standard price is `24 per unit. Solution: Standard Price Method

Stores Ledger Account Note: The value of closing stock of 400 units at the standard price of `24 should be `9,600. The difference of `2,700 (i.e., `9,600 – 6,900) represents favourable price variance and to this extent the closing stock is undervalued. This favourable variance may be partly due to the efficiency in purchasing and partly due to other factors.

Techniques of Inventory Control NOTES Self-Instructional 64 Material

Highest-in, First-out (HIFO) Method In this method, materials issued are charged at the rate of the highest priced materials in stores. This highest rate is continued to be used until material at that highest price is exhausted, after which the next highest price is used. Thus, in HIFO method, the production absorbs the high cost of materials and closing stock is valued at lower rates. The HIFO method has the advantage that in fluctuating market, the highest cost of materials is recovered first and inventory valuation is kept at the lowest which is tantamount to creating a secret reserve. This method is not popular but is used in 'cost-plus contracts' with advantage.

Next-in, First-out (NIFO) Method Here materials are not charged at a price which has been paid, but rather at a price at which an order has been placed, i.e., the price of materials that will be next received. For example, in stock there are two batches of materials, one at `15 and the other at `16. There is a further batch of materials on order at `16.50 which has not yet been received. If materials were to be issued now, these will be charged at `16.50. The main argument in favour of this method is that this is a more up-to-date replacement price than the LIFO method. Specific Price or Identifiable Cost Method Special materials purchased exclusively for specific jobs or work orders should be charged to those specific jobs at the specific (actual) price. This method can always be used where materials are purchased and set aside for a particular job or work order until required for production. Those materials which have not been purchased for specific jobs, are issued according to FIFO, LIFO or any other method. Of course, this method has only a limited application. But it enjoys the advantages of pricing the materials at actual cost and thus is desirable from costing point of view. This method has a special application in job order industries, where special materials may be purchased for specific jobs.

Illustration 4.7: From the following information, prepare a Stores Ledger Account using Specific Price Method.

1 July Purchased for Job No. 108 500 units @ `20 each
 4 July Purchased for Job No. 107 400 units @ `21 each
 8 July Purchased for Job No. 109 800 units @ `24 each
 24 July Purchased for Job No. 112 1,000 units @ `25 each

Techniques of Inventory Control NOTES Self-Instructional Material 65

6 July Issued 400 units to Job No. 107
 9 July Issued 300 units to Job No. 108
 13 July Issued 700 units to Job No. 109
 14 July Issued 200 units to Job No. 108
 26 July Issued 500 units to Job No. 112
 28 July Issued 100 units to Job No. 109

Solution:

Specific Price Method Stores Ledger Account *

This closing stock consists of 500 units @ `25 = `12,500 for Job No. 112. Base Stock Method This method assumes that minimum (base) stock is always held in stock and is not issued. This is in the nature of a fixed asset and is carried at original cost. Any quantity in excess of base stock is valued according to one of the other methods, i.e., FIFO, LIFO, Average, etc. Thus, base stock method is not an independent method and has to be used along with some other method. Though theoretically sound, the base stock method is rarely encountered in practice. It offers the advantages of simplifying valuation of inventory because base stock values are fixed. But the inventory valuation may not reflect the current market prices. Other merits and demerits of this method depend upon whether FIFO, LIFO, or any other method that is used, along with this method. Illustration 4.8:

With the information provided in Illustration 4.1, prepare a Stores Ledger Account. Assume base stock is 100 units. Use FIFO method along with Base Stock Method.

Techniques of Inventory Control NOTES Self-Instructional 66 Material Solution:

Base Stock Method Stores Ledger Account * Closing stock consists of base stock of 100 units @ `20 = 2,000 + 300 units @ `25 = 7,500, total 400 units at `9,500.

Periodic Simple Average Method

This method is similar to simple average method

except that the issue price here is computed periodically (normally at the month-end) and not at the time of each issue of material. Thus the periodic average covers the prices of purchases made during that period. In order to compute periodic simple average, the prices paid for different lots are added and the total is divided by the number of prices. Thus: Periodic simple average price =

Total of purchase prices during the period / No. of prices during the period

All the issues of material during that period will be priced at this periodic simple average. It should be noted that the price of the opening stock does not enter the computation of average price. Periodic Weighted Average Method Like periodic simple average method, in this method also average price is calculated at the end of a given period (which is usually one month). The weighted average price is calculated at the end of a given period by dividing the total cost of purchases during the period by the quantity purchased. Thus:

Techniques of Inventory Control NOTES Self-Instructional Material 67 Periodic weighted average price =

Total cost of materials purchased / Quantity purchased

The purchases during the period and closing stock are included in this calculation but it must be noted that the opening stock does not enter into this calculation because it was not purchased during the current period and would have been included in the last period's calculation. Moving Simple Average Method In this method, the periodic simple average is further averaged. For this purpose, a number of periods (or months) is decided first and then

the total of the periodic average prices of the given periods is divided by the number of periods taken. When a 5-monthly moving average is to be calculated, one has to add the periodic simple average prices of 5 months (including and preceding the month for which issue price is required) and divide it by 5 to give the moving simple average price. For example, if moving average price is to be calculated for five months of January to May, then we will add the periodic simple average prices of January to May and divide it by 5, to give the moving simple average price. The price so calculated will be applicable for issues during the month of May. For the month of June, we omit the periodic simple average of January and add the price of June and divide by 5 to get the issue price. Thus, the average price is made to move from month to month by omission of the average price of the earliest month and including the average price of the month for which issue price is applicable. Illustration 4.9: Compute simple moving average rates in a paint industry which purchased double boiled oil at different monthly rates as given below. Six-monthly moving rate is to be computed from June. Month Price per litre (₹) January 2.50 February 2.60 March 2.90 April 2.80 May 2.75 June 2.75 July 2.65 August 2.80 (ICWA Inter)

Techniques of Inventory Control NOTES Self-Instructional 68 Material Solution: Computation of Moving Simple Average Rate Month Price per Six monthly Simple moving litre total average (a) (b) (c) [c ÷ 6] January 2.50 February 2.60 March 2.90 April 2.80 May 2.75 June 2.75 16.30 2.72 July 2.65 16.45 2.74 August 2.80 16.65 2.77 Moving Weighted Average Method In this method, the moving average price is calculated in exactly the same way as the moving simple average price except that periodic weighted average prices are taken for averaging. Inflated Price Method This method is used where materials are subject to some inevitable losses that may arise from evaporation, breaking the bulk, etc. The issue price is slightly inflated to ensure that the loss is covered and the full cost of the material concerned is recovered. For instance, let us assume 100 gallons of a liquid are purchased at ₹9 per gallon and a loss of 5% is expected. This means only 95 gallons would be available for issues to production. In order to recover the original cost of ₹900 (i.e., 100×9), the issue price must be $\frac{900}{95}$ gallons = ₹9.47. This is not a distinct method of pricing but only a procedure for accounting adjustment. It is, therefore, used in conjunction with one of the other methods like FIFO, LIFO. Illustration 4.10: 3,000 feet of leather is purchased at 48 paise per foot. Normal wastage on account of cutting the bundle of leather into pieces of one foot is estimated at 10 per cent. The wastage has a saleable value of 30 paise per foot. Calculate the cost of material of work order requiring 450 pieces of cut leather. Solution: Cost of leather = $3,000 \times 0.48 = ₹1,440$ Less: Saleable value of normal loss (300 ft @ ₹0.30) 90 Net cost ₹1,350

Techniques of Inventory Control NOTES Self-Instructional Material 69 Normal quantity available (3,000 ft less 10%) = 2,700 ft Issue rate per ft = $\frac{1,350}{2,700}$ ft = ₹0.50 Cost of 450 pieces = $450 \times 0.50 = ₹225$ Pricing of Materials Returned Sometimes, materials may be returned by production department to stores for some reason or the other. Such return of materials

may be treated by one of the following two methods: 1.

The returned materials may be entered in the Receipts column of Stores Ledger Account at the price at which these were originally issued at if they were a new purchase. These materials are re-issued for production at a price according to the method of pricing in vogue. 2. The returned materials are recorded in the Receipts column of the Stores Ledger Account at the price at which these were originally issued and issued at the immediately next stores requisition at the same price. Choice of Method of Pricing The various factors affecting choice of a method are: 1. The extent of price fluctuations 2. Frequency of receipts and issues of materials 3. Type of costing system in use, i.e., job or process costing 4. The proportion of material cost in total cost 5. Degree of accuracy required 6. Whether issues can be identified with purchased lots 7. Whether standard costing system is in use 8. The need for maintaining uniformity in costs within the industry 9. The nature of material, i.e., whether it is subject to some losses like evaporation, breaking the bulk, etc. 10.

Managerial policy regarding valuation of closing stock Check Your Progress 1. List the reasons which the balance of an item of store as shown in the bin card differs from that shown in the stores ledger. 2.

What happens after the first batch is fully issued in the FIFO method? 3. When is the replacement price method used? 4. Which type of industry uses the identifiable cost method?

Techniques of Inventory

Control NOTES Self-Instructional 70 Material 4.4 TREATMENT OF WASTE, SCRAP, DEFECTIVES AND SPOILAGE

Losses of materials may arise during handling, storage or during process of manufacture. Such losses or wastages are classified into two categories—normal loss and abnormal loss. Normal Loss: This is that loss which has necessarily to be incurred and thus is unavoidable.

Examples are: (i) Loss by evaporation in case of liquid materials. (ii) Loss due to loading and unloading of material, say, in case of coal and other materials of such nature. (iii) Loss due to breaking the bulk.

When materials are purchased in large quantity and issued to production in small lots, some difference is likely to arise. Normal losses of material cannot be completely eliminated but may be controlled to a limited extent.

Abnormal Loss:

This is that loss which arises due to inefficiency in operations, bad luck, mischief, etc. Examples are: (i) Theft or pilferage (ii) Breakage (iii) Fire, accident, flood, etc. (iv) Use of inaccurate weighing instruments (v) Improper storage resulting in deterioration of materials Control of Material Losses The following steps are suggested to control the loss of materials: 1. Proper storage conditions should be provided,

particularly

in case of perishable materials. 2. The store room should be well guarded and protected to avoid the risks of fire or theft, etc. 3. In order to reduce losses due to obsolescence,

materials should be issued on first-in, first-out basis. 4. Accuracy of

weighing instruments should be periodically checked. 5. A systematic procedure should be developed regarding movement of materials from one place to another

and no unauthorized movement of materials should be permitted. 6.

Specialized material handling equipment should be employed so as to minimize losses in materials handling.

Techniques of Inventory

Control NOTES Self-Instructional Material 71

Accounting Treatment It is a principle of costing that all normal losses which are necessarily to be incurred are treated as a part of the cost and abnormal losses which are really avoidable should not be included in the cost. Therefore, in order to absorb normal material losses in cost, the rates of usable materials in stock are inflated so that such losses are covered. Alternatively, normal material loss is transferred to factory overhead. Abnormal material losses, such as those due to breakage, theft, fire, flood and abnormal evaporation, are charged to Costing Profit and Loss Account. Material losses

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

These are explained below: Waste

Meaning:

Waste has been defined as 'that

portion of a

basic raw material lost in processing, having no recovery value.'

In fact, waste is a

material loss during production or storage due to various factors, such as evaporation, chemical reaction, shrinkage, contamination, unrecoverable residue,

which has little or no value. Waste may be visible or invisible. Visible waste is that which

is physically present, e.g., ash and saw dust. An invisible waste,

on the other hand,

is the disappearance of basic raw material in the form of evaporation, smoke, etc. Waste in certain industries creates problems of disposal.

Usually this is disposed of in the easiest and cheapest manner, e.g., liquid wastes may be poured into nearby rivers.

Control of waste: Waste has the effect of reducing the quantity of output. Thus, waste should be reduced to the minimum. Allowance for normal waste should be made on the basis of past experience, technical factors and any special features of the material, product and process, etc. Responsibilities should be assigned for any waste over and above the normal waste. A Waste Report should be prepared periodically to compare the actual waste with the predetermined level.

Accounting of waste: Waste usually has no realizable value. If waste is a part of the normal process loss, the cost will be absorbed by the good production. On the other hand, if it is a part

of the abnormal process loss, it is transferred to Costing Profit and Loss Account.

However, if waste has any sale value at all, then the small amount received should be treated as 'other income'. Scrap

Meaning: This

is defined as 'the incidental residue from certain types of manufacture usually of small amount and low value, recoverable without further processing.'

According to Cost Accounting Standard-6 (CAS-6), issued by

ICWA of India, '

scrap is the "

discarded material having some value in a few cases

and which is usually either disposed of without further treatment

Techniques of Inventory Control NOTES Self-Instructional 72 Material (

other than reclamation and handling) or re-introduced into the process in place of raw materials.” Scrap has the following features: (a) Scrap is incidentally produced from the manufacturing process. (b) Scrap is usually of small value. (c) No further processing is required to realize its saleable value. (d) Scrap may be used in place of raw material, in some cases. (e) Unlike waste, scrap is always physically available. Examples of scrap are trimmings in timber industries; cuttings, pieces, etc., in leather and readymade garments factory and cut pieces of metal sheets. Control of scrap: Like waste, scrap also increases the cost of production. Although scrap might realize a nominal amount, the sale value will mostly be much lower than the cost of raw materials. Therefore, scrap should be kept as low as possible and a proper control should be exercised on this loss of materials. Control of scrap is possible by setting standards for scrap, determining the responsibility for scrap and by keeping proper records of scrap. A Scrap Report should be prepared at regular periods whereby a comparison should be made between actual scrap and standard allowance for scrap and remedial measures should be taken for any adverse variances that may be detected.

Accounting of scrap: The problem of scrap is more complex than that of waste. It may be treated in any of the following ways: (a) As other income: Sales of scrap may simply be treated as ‘other income’ and credited to Profit and Loss Account.

This method is particularly suitable when the scrap has a relatively small realisable value, after taking into account the cost of its disposal and marketing. (

b) Credit to overheads: The net value of scrap, i.e., after adjusting selling and distribution costs, may be credited to production overheads of the department producing the scrap.

An alternative to this method is that net realisable value is credited to the material cost. (

c) Credit

to job or process: The realisable value of scrap may be credited to the job or process which yields the scrap. This method is suitable

when

scrap is identifiable with a particular job or process and

is of significant value. Spoilage Meaning: Spoiled work results when materials are damaged in manufacturing operations is

such a way that they cannot be rectified and brought back to normal specifications.

Spoilage differs from scrap in that scrap unavoidably arises as a result of manufacturing operations, whereas spoilage occurs due to some defect in materials or manufacturing operations which could have been avoided. Spoiled work may have a realisable value and in certain cases, it is sold as ‘seconds’.

Techniques of

Inventory

Control NOTES Self-Instructional Material 73

Control of spoilage: Normal spoilage should be determined in advance and it should be periodically compared with actual spoilage in the Spoilage Report. Causes of any abnormal spoilage should be investigated and remedial measures immediately taken.

Accounting of spoilage: For accounting purposes, spoiled work should be divided into normal and abnormal. The cost of normal spoilage

should be borne by good production. This can be done by charging

the loss due to spoilage to production and spreading it over the good units produced. Abnormal spoilage, caused due to inefficiency and treated as controllable should be transferred to Costing Profit and Loss Account. Defectives

Meaning: Defective work

may be defined as ‘that production which is below standard specifications or quality and can be rectified by incurring additional expenditure (of material, labour, etc.) known as rectification costs.’ The main difference between spoilage and defective is that whereas the former cannot be rectified and sold as good units, the latter can be rectified by incurring additional costs and brought back to the level of standard product. Sometimes, when defectives cannot be rectified as standard product, they may be sold as ‘seconds’. Control of

defectives: This should cover not only control over the quantity of defective production but also control over rectification costs. On the basis of past experience, standards for defective work and rectification costs should be fixed.

Reasons for any defectives over and above the normal or standard defective work should be fully investigated and corrective steps should be taken. If, for example, defective output is due to bad workmanship, suitable incentives may be provided to workers for minimizing the defective work. A report on defective work should be periodically prepared.

Accounting of defective work: The main problem in accounting of defective work is the problem of treatment of rectification or rework costs. Where defective work is easily identifiable with specific jobs, the rectification costs should be debited to the jobs concerned. Where, however, such work cannot be conveniently identified with jobs, the rectification costs may be debited to overheads. In the case of abnormal type of defective work, the rectification costs may be transferred to Costing Profit and Loss Account. 4.5

ABC AND VED ANALYSIS In this section, you will learn about the ABC and VED analysis of material cost control.

Techniques of Inventory Control NOTES Self-Instructional 74 Material

ABC Analysis

ABC technique is a value based system of material control. In this technique,

materials are analysed according to their value so that costly and more valuable materials are given greater attention and care.

All items of materials are classified according to their

value—high, medium and low values, which are known as A, B and C items, respectively. ABC technique is sometimes called Always Better Control method. '

A' Items—These are high value items which

may consist of only a small percentage of the total items handled.

On account of their high cost, these materials should be under the tightest control and the responsibility of the most experienced personnel.

B' Items—These are medium value materials which should be under the normal control procedures. 'C' Items—

These are low value materials which may represent a very

large number of items. These materials should be under simple and economical methods of control.

The point of classifying stock into A, B and C categories is to ensure that material management focuses on A items

where sophisticated controls should be installed. B items may be given less attention and

C items least attention. Thus ABC technique is a selective control which aims at concentrating efforts on those materials where attention is needed most.

This is so because it is unwise to give equal attention to all items in stock. The items are listed and ranked

in the order of their descending importance showing

quantity and value of each item. This is illustrated below with arbitrary percentage figures. Category % of total value % of total quantity Type of control A 70 10 Strict control B 25 30

Moderate control C 5 60 Loose control Total 100 100

In the above table it is shown that 10 per cent of the total items account for as much as 70 per cent of the total value.

These are A category items which need very strict control because of their high cost significance. The second type of items represent 30

per cent of the total quantity but account for 25 per cent of the total value. These are B items which need routine type of control. Finally, the items representing 60 per cent of the total quantity account only for 5 per cent of total value. These

C items

are kept under simple physical control. The rules regarding purchasing, storing and issuing of various categories of items should be formed according to the value and importance of materials.

Techniques of Inventory Control NOTES Self-Instructional Material 75 Advantages: The advantages of ABC technique are as follows: 1. Closer and stricter control can be exercised on those items which represent large amounts of capital

invested. 2. Investment in inventory is

regulated and funds can be utilized in the best possible

way. 3. Economy in stock carrying costs. 4.

It helps in maintaining enough safety stock for 'C' category items. 5. Selective control helps in maintaining high stock turnover

rate. VED Analysis You have seen in the aforementioned section, that ABC analysis uses a quantifiable approach to

categorizing inventory, the Vital Essential Analysis uses a more qualitative approach. The fundamental question behind

using this technique is to find out the essential item without which the production will come to a halt. It is possible that

under the ABC analysis, the essential item for your production is least costly and therefore categorized under C category.

But this would be a grievous categorization since, the absence of such item would adversely affect production. VED

analysis unlike ABC analysis, does not take into account the intrinsic value of the item, instead it computes the 'nuisance value'. This denotes the cost that the unit will incur on not having the item in store. VED analysis then divides the items of

production into three categories: vital, essential and desirable. Vital item is necessary for production, the absence of

essential item will not halt production but will have an impact on speed, quality and costs and the presence of desirable

item will not affect the functioning but might cause disruptions or losses. Check Your Progress 5. Give some examples of

abnormal loss. 6. What is the accounting treatment of waste,

if it is a part of the abnormal process loss? 7.

State the purpose of classifying stocks into A, B and C categories. 4.6 ANSWERS TO CHECK YOUR PROGRESS

QUESTIONS 1. The two reasons why there arises a difference between

the balance of an item of store as shown in the bin card and that in stores ledger are: (a) some arithmetic error in working out the balance; and/or (b) wrong posting or non-posting in bin card or stores ledger.

Techniques of Inventory Control NOTES Self-Instructional 76 Material 2. In the FIFO method,

after the first batch is fully issued, the price of the next batch received becomes the issue price. 3.

The replacement price method is used when it is desired to reflect the current prices in cost. 4. The identifiable cost method has a special application in job order industries, where special materials may be purchased for specific jobs. 5.

Some examples of abnormal loss include:

theft or pilferage, breakage, fire, accident, flood, etc., use of inaccurate weighing instruments

and improper storage resulting in deterioration of materials. 6. If the waste

is a part

of the abnormal process loss, it is transferred to Costing Profit and Loss Account. 7.

The point of classifying stock into A, B and C categories is to ensure that material management focuses on A items where sophisticated controls should be installed. B items may be given less attention and C items least attention. 4.7

SUMMARY ? There are two methods of

inventory systems: periodic inventory system and perpetual inventory system. ? Under perpetual inventory system

of inventory control, bin cards and stores ledger records show stores balances after each receipt and issue so that current balance of stores is shown at any point of time,

any receipts being added to and any issues being deducted from the balance after each transaction. ?

When materials are issued from stores

to production department, a question arises regarding the price at which

materials issued are to be charged.

This is because

the same type of material may have been purchased in different lots

of different times at several different prices. ?

Methods of pricing material or stores issues are:

First-in, First Out Method; Last-in First-out Method; Average

Cost

Methods; Replacement Price Method; Standard Price Method; etc. ? Loss

of materials may arise during handling, storing or during process of manufacture. Such losses or wastages are classified into two categories: normal loss and abnormal loss. ?

It is a principle of costing that all normal losses which are necessarily to be incurred are treated as a part of the cost and abnormal losses which are really avoidable should not be included in the cost. Therefore, in order to absorb normal material losses in cost, the rates of usable materials in stock are inflated so that such losses are covered. Alternatively, normal material loss is transferred to factory overhead.

Techniques of Inventory Control NOTES Self-Instructional Material 77 ?

Abnormal material losses, such as those due to breakage, theft, fire, flood and abnormal evaporation, are charged to Costing Profit and Loss Account. ?

ABC technique is a value based system of

material control in which materials are analysed according to their value so that costly and more valuable materials are given greater attention and care. ?

VED analysis unlike ABC analysis, does not take into account the intrinsic value of the item, instead it computes the 'nuisance value'. This denotes the cost that the unit will incur on not having the item in store. ? VED analysis then divides the items of production into three categories: vital, essential and desirable. Vital item is necessary for production, the absence of essential item will not halt production but will have an impact on speed, quality and costs and the presence of desirable item will not affect the functioning but might cause disruptions or losses. 4.8 KEY WORDS ? First-in, First-out (FIFO): It is a

method based on the assumption that materials which are purchased first are issued first. ?

Last-in, First-out (LIFO): It is a

method which operates in just the reverse order of FIFO method, i.e., the last materials purchased are issued first. ?

Average Cost Methods: It is

based on the assumption that when materials purchased in different lots are stored together, their identity is lost, and therefore, issues should be charged at an average price. ?

Waste: It is that form of material loss whereby 'basic raw material is lost in processing, having no recovery value.' ?

Scrap: It

is defined as 'the incidental residue from certain types of manufacture usually of small amount and low value, recoverable without further processing.' 4.9

SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer Questions 1. What is the

periodic inventory system? 2. State the advantages of the perpetual inventory system. 3. Write a short note on ABC and

VED analysis. Long Answer Questions 1. Describe the steps involved in the perpetual inventory system.

Techniques of Inventory Control NOTES Self-Instructional 78 Material 2. What are the various methods of pricing material issues? When do you advocate pricing the issues at cost price based on the 'Last-in, first-out' method? 3. Explain the FIFO and LIFO methods of valuing material issues. Discuss the effect of rising prices and falling prices on these two methods of pricing of material issues. 4. Explain the accounting treatment and control of the following in cost accounts: (a) Waste, (b) Scrap, (c) Defective, (d) Spoilage. 4.10 FURTHER READINGS

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Labour Cost Control NOTES Self-Instructional Material 79 UNIT 5 LABOUR COST CONTROL Structure 5.0 Introduction 5.1 Objectives 5.2

Labour Turnover 5.3 Time Keeping and Time Booking 5.4 Treatment of Idle Time and Overtime Cost 5.5 Wage Rates for Costing and Systems of Wage Payment 5.5.1 Time Rate and Piece Rate system 5.5.2

Incentive Plans 5.6 Answers to Check Your Progress Questions 5.7 Summary 5.8 Key Words 5.9 Self Assessment Questions and Exercises 5.10 Further Readings 5.0 INTRODUCTION

Labour or manpower represents human resources used in production. After material cost, labour cost is the second major element of cost. Despite large scale use of machinery and advanced technologies in manufacturing, the role of labour in production cannot be underestimated. So significant is the role of labour that productivity of all other resources depends on the productivity of human resources. In other words, higher efficiency of labour helps in lowering the cost per unit of production. There is, therefore, a special need for proper organization for accounting and control of labour cost. According to Cost Accounting Standard-7 (CAS-7) issued by

ICWA of India,

employee cost is '

the aggregate of all kinds of consideration paid, payable and provision made for future payments, for the services rendered by employees of an enterprise (including temporary, part time and contract employees). Consideration includes wages, salaries, contractual payments and benefits, as applicable, or any payment made on behalf of the employee. This is also known as labour cost.'

Labour cost is of two kinds: (i) Direct labour cost, (ii) Indirect labour cost

Organization for Accounting and Control of Labour Cost There are mainly five departments in an organization which deal with labour. These are as follows: Personnel department: This is a service department and is mainly concerned with the proper selection and training of workers and placing them on jobs for which they are best suited.

Labour Cost Control NOTES Self-Instructional 80 Material

Engineering department: This department prepares and plans specifications of jobs makes job analysis, conducts time and motion studies, makes provision for safe working conditions and supervises production activities. Time-keeping

department: This department is concerned with recording of workers's time. The recording of time put in by workers is required not only for attendance and wage calculation purpose but also for the purpose of cost analysis and

apportionment of labour cost over various jobs. Payroll department: This department maintains a record of job classification and wage rate of each employee and performs the function of computation of wages payable to them by preparing payroll or wage sheet. It is also responsible for disbursement of wages. Cost accounting department: This department accumulates and classifies all cost data of which labour is one important element. It analyses the payroll and prepares routine and special labour cost reports for submission to management so that proper control may be exercised on labour cost.

In this unit, you will learn about the different methods of labour cost control. 5.1 OBJECTIVES After going through this unit, you will be able to: ? Discuss the meaning and causes of labour turnover and the methods of its measurement ?

Explain the various methods of time keeping and time booking ? Describe idle time and overtime and their effect on cost ?

Explain time rate and piece rate systems of labour remuneration ? Classify various incentive plans of labour remuneration 5.2

LABOUR TURNOVER

Labour turnover falls under the purview of personnel department.

In all business organizations, it is a common feature that some workers leave the employment and new workers join in place of those leaving. This

change in work force is known as labour turnover. Labour turnover is thus

defined as 'the rate of change in the composition of the labour force in an organization.'

Labour turnover varies greatly between different trades and industries. For example, where part-time and seasonal labour is employed, the rate will be higher. Measurement of Labour Turnover To facilitate comparisons between different periods and different undertakings, labour turnover may be expressed in a rate.

Labour Cost Control NOTES Self-Instructional Material 81

There are three alternative methods by which this rate is computed. Once a particular method is used, it should be consistently followed for comparative analysis. The methods are: 1. Separation method: This method takes into account only those workers who have left during a particular period. Its formula is:

Labour Turnover Rate =

No.

of workers who have left during a period Average no. of workers during the period $\times 100^*$

Average Number = No. of workers No. of

workers at the +

in the beginning end of

the period 2^*

Multiplication by 100 in the given formulae indicates that the rates are in percentage. 2.

Replacement method: This method takes into account only those new workers who have joined in place of those who have left. Its formula is:

Labour Turnover Rate =

No. of workers replaced during the period Average no. of workers during the period $\times 100$

If new workers are engaged for expansion programme or any other such purpose, they are not considered for this computation. 3.

Flux method: This shows

the total change in the composition of labour force due to separations and replacement of workers.

Its formula is: Labour Turnover

Rate =

No. of workers who left + No. of workers replaced Average no.

of workers $\times 100$

Labour Turnover due to New Recruitment: It has been stated above that workers joining the organization on account of opening of new departments or due to any type of expansion programme should be excluded while calculating the labour turnover rate. But these new workers recruited are certainly responsible for a change in the composition of labour force. Therefore, some cost accountants measure turnover rate for these new workers (excluding replacements) by the following method:

Labour Turnover Rate = new No. of workers joining

in the period (excluding replacement) Average no. of workers $\times 100$

Total number of workers joining, including replacements, is called accession. The labour turnover rate in such a case may be calculated in respect of workers joining (accession) the organization during the period which includes all workers joining due to replacements and also due to expansion. It is calculated as follows: Labour

Turnover Rate =

No. of accessions during a period Average no. of workers $\times 100$

Labour

Cost Control NOTES Self-Instructional 82 Material

When labour turnover rate is computed by taking into account the number of accessions, the flux method rate will be calculated as follows: Labour Turnover Rate =

No. of No. of No. of new workers + + Separations replacements recruited

Average no. of workers $\times 100$ (Flux Method) or = No. of Separations + No. of accessions Average no. of workers $\times 100$

Equivalent Annual Labour Turnover Rate: Labour turnover rate, as explained above, may be computed for a month, a quarter or for any period other than a year. It

may be converted into an equivalent annual labour turnover rate by using the following formula:

Equivalent annual = Turnover rate

for the period No. of days in the period $\times 365$

days

labour turnover rate

Illustration 5.1: From the following data given by the Personnel Department, calculate the labour turnover rate by applying: (a) Separation

method (b) Replacement method (c) Flux method

No. of workers on the payroll:

At the beginning of the month 900 At the end of the month 1,100

During the month, 10

workers

left, 40 persons were discharged

and 150

workers were recruited. Of these, 25 workers are recruited in the vacancies of those leaving, while the rest were engaged for an expansion scheme. (ICWA Inter) Solution:

Average no. of workers = $\frac{900 + 1,100}{2} = 1,000$ No. of workers left = $10 + 40 = 50$ 1. Separation Rate = $\frac{50}{1,000} = 5\%$ 2.

Replacement Rate = $\frac{25}{1,000} \times 100 = 2.5\%$ 3. Flux Rate = $\frac{50 + 25}{1,000} \times 100 = 7.5\%$ *

Note: Additional workers engaged on expansion plan have not been considered.

Labour Cost Control NOTES Self-Instructional Material 83

Alternative methods produce the following rates: Labour turnover rate for new workers = $\frac{125}{1,000} \times 100 = 12.50\%$ (excluding replacements) Labour turnover

rate (for accessions) = $\frac{25 + 125}{1,000} \times 100 = 15\%$

Labour turnover rate (Flux Method) = $\frac{50 + 25 + 125}{1,000} \times 100 = 20\%$ Causes of Labour Turnover Labour turnover

reports should be prepared regularly to be placed before the management, giving a breakdown of the causes as to why the workers left. The causes may be classified in two broad categories: (i) Avoidable causes; and (ii) Unavoidable causes.

Avoidable causes: These include: 1. Low wages and allowances 2. Unhappy relations with co-workers and supervisors 3. Unsatisfactory working conditions 4. Trade union rivalry 5. Lack of medical facilities, transport facilities, etc. 6. Inadequate job security and retirement benefits Unavoidable causes: These include: 1. Death or retirement 2. Illness or accident 3.

Domestic problems 4. Discharge on disciplinary grounds 5. Seasonal nature of business 6. Change in plant location 7. Personal dislike for job or environment 8. Marriage—particularly in the case of women workers 9. Change of job for

betterment Effect of Labour Turnover A certain amount of labour turnover will always take place. To a limited extent this may be welcome, particularly at the lower management level as it creates vacancies for internal promotions which acts as motivation for young and ambitious workers. Moreover, new workers bring new ideas and methods of doing work from other organizations.

Labour

Cost Control NOTES Self-Instructional 84 Material

Labour turnover is expensive and generally it should be minimized because it leads to increased cost of production for reasons stated below. Cost of Labour Turnover

The cost of labour turnover may be broadly classified into two broad categories: (i) Preventive costs; and (ii) Replacement costs. Preventive costs: These costs are those which are incurred to

keep the work force satisfied and to prevent or discourage them from leaving the organization. These include: 1. Cost of personnel management—only that portion of this cost which can be attributed

to the efforts of the personnel department in maintaining good relations between management and workers 2. Cost of welfare activities and services, e.g., canteen meals, co-operative stores, educational and transport facilities and housing schemes 3. Cost of medical services 4. Pensions schemes—to provide security and retirement benefits 5. Extra bonus and other perquisites (in excess of those given by other similar concerns) to discourage their defecting to other undertakings Replacement costs: These costs include all such losses and wastages

arising because of the inexperienced new labour force replacing the existing one as well as the cost of recruitment and training of the new workers. These include: 1. Cost of recruitment and selection of new employees 2. Cost of training of new workers 3. Loss of output due to some time gap in recruiting new workers 4. Loss due to inefficiency of new workers 5. Cost of accidents due to lack of experience of new workers 6. Cost of extra scrap and defective work of new workers 7. Cost of tools and machine breakdown due to faulty handling by new workers

Reduction and Control of Labour Turnover Labour turnover may be reduced by taking action on the basis of avoidable causes given earlier. The following steps may be taken in this regard: 1. Devising a suitable and satisfactory wage policy 2. Providing working conditions conducive to health and efficiency 3. Impartial and sympathetic attitude of personnel management 4. Introducing financial and non-financial incentive plans 5. Providing promotional opportunities 6.

Encouraging labour participation in management

Labour Cost Control NOTES Self-Instructional Material 85 7.

Introducing an effective grievance procedure 8. Strengthening the welfare measures Treatment of Cost of Labour

Turnover: The preventive cost of labour turnover should be apportioned to various departments on the basis of number of workers in each department. Regarding the replacement costs, if the replacement is due to the fault of a particular department, it should be directly charged to that department. If labour turnover is due to the defective management policy, the replacement cost should be apportioned to various departments on the basis of number of workers in each department.

Check Your Progress 1.

What are the three methods of calculating rate in labour turnover? 2.

What are the avoidable causes of labour turnover? 5.3 TIME KEEPING AND

TIME BOOKING The time-keeping department is an important part of a firm's system of accounting and control of labour cost. The main function of this department is to accurately record each worker's time of arrival and departure in the factory and also the time spent on different jobs or processes. Thus it embraces two functions: (a) Time keeping, i.e., recording arrival and departure time of workers for attendance purpose and for calculation of wages; and (b) Time booking, i.e., recording time spent by workers on different jobs or processes for determining labour cost of jobs/processes. The purpose of time recording is to provide basic data for: (i) Preparation of payroll (ii) Attendance records, to meet statutory requirements (iii) Computing labour cost of a job or process (iv) Computing overhead cost of jobs, if based on wages or labour hours (v) Statistical analysis of labour records for determining productivity and control of labour cost

Methods of Time Keeping There are mainly three methods for recording attendance of workers. 1. Attendance register: In this method, attendance of each worker is recorded in the register maintained for this purpose. This register provides sufficient number of columns for attendance of each worker. Entries in the arrival and departure columns may be made by the foreman or the worker himself. If workers are literate,

Labour Cost Control NOTES Self-Instructional 86 Material

they should be required to sign against their entries to avoid any dispute later on. Separate attendance register may be maintained in each department if the number of workers is large, otherwise one register will serve the purpose. This method is quite simple and cheap. But it can be used only when the number of workers is small. In such cases, generally there is no need for a separate time keeper as the work is done by the foreman. 2. Token or disc method: Each worker is allotted an identification number is suitably painted or engraved on a round metal token (or disc) with a hole in it. All such tokens are hung in a serial order

on a board at the factory gate. As the worker arrives, he removes his token from the board and puts it in a box kept nearby

or hangs it on another board which is specially kept for this purpose. After the fixed time, the box or the second board is removed. Those coming late have to hand over their tokens personally at the time office so that exact time of their arrival can be noted. The time office records attendance on the basis of tokens in the box. The absentees are indicated by the missing tokens.

Similar procedure is followed at the departure time in the evening. This method is not fool-proof as a worker may try to get his absentee friends marked present by dropping their tokens in the box. 3. Time-recording clocks: Unlike the first two methods, this is a mechanical method of recording attendance and proves quite useful when the number of workers is fairly large. Each worker is allotted a Clock Card which bears his identification number, name, department, etc. These cards are kept in a rack in a serial order. There are usually two racks—an 'In' rack and an 'Out' rack. On arrival, the worker will pick up his card from the 'Out' rack, put it in the slot of the clock, press a button and the exact time is printed on the card. After this the card is put in the 'In' rack. An inspection of the 'Out' racks will reveal absentees. A similar procedure is followed if workers leave the factory at mid-day for lunch or in the evening at close time. Clocks are adjusted so that late arrivals, early or late leavings, overtime, etc., are automatically printed in red. The time keeper must take care to ensure that no worker places friend's card in the clock in addition to his own, so as to avoid proxy. At the end of each week, the cards are sent to the pay office and a fresh set of cards for the ensuing week is placed in the racks. Advantages: The main advantages of installing time-recording clocks are: 1. The method is quite economical for large concerns as the initial heavy capital expenditure in installing clocks is recovered by savings in operating expenses, i.e., economy in wages of time recording staff

Labour Cost Control NOTES Self-Instructional Material 87 2.

Chances of disputes are reduced as clocks provide more authentic records than hand-written documents 3.

Work in connection with the preparation of wage sheets becomes

easier because clock cards may be utilized for calculation of wages The main shortcoming of this method is that heavy initial capital investment is required which small concerns may find difficult to afford 4. Biometric Time Clock: Biometric time-recording clock is an electronic device to record attendance of employees. It is a new generation technique which is replacing the typical time clock used to track employee attendance. Instead of employees punching a time card or logging their attendance by hand, they simply place their finger on the Fingerprint Reading Sensor or place their hand into the Hand Reader and the rest of the work is done by the machine. This device completely eliminates the time and effort required to monitor the time clock activity at punch in/out times, consequently leading to substantial cost saving and improved productivity. The main features and advantages of biometric system are that it can: 1. Eliminate time card 2. Automatic payroll processing 3. Eliminate buddy-punching 4. Eliminate early punch hours 5. Eliminate unauthorized overtime 6. Eliminate time spent on payroll calculations 7. Accurately report employee time/attendance to payroll and HR Time Booking In addition to recording worker's time of arrival and departure, it is necessary to record the details of work done by the workers and the time spent on each job or process. Recording of worker's time spent on different jobs is known as time booking. The objectives of time booking are: (i) to ensure that the time for which

a worker is paid is properly utilized; (ii) to ascertain the labour cost of work done; (iii) to provide a basis for apportionment of overheads; (iv) to ascertain the idle time so as to control it. Methods of Time-booking The following are the common methods of time booking: 1. Job Ticket: Job tickets or job cards are very commonly used for recording the time spent on each job. A card is prepared for each job and is allotted to the worker who takes up that particular job. The worker enters in this card the time of starting as well as finishing the job. After finishing the job,

Labour Cost Control NOTES Self-Instructional 88 Material

the worker submits his work along with his job ticket. He is then issued another job ticket for the next job. Thus, only one job ticket is issued to a worker at a time. Such job tickets also serve the purpose of authorizing the worker to carry out the job stated therein. However, if there is a loss of time between finishing of one job and beginning of the next job, it should be entered on the idle time card so that the record of his day's activities may be complete and the time lost is not unduly charged against production. Such idle time card should also show the reasons for idle time, like machine breakdown, waiting for instructions or lack of tools or materials. 2. Combined Time and Job Card: This card combines the two in one—the clock card and job card, i.e., it records both the attendance time as well as time spent on different jobs. Idle time is automatically revealed as the difference between attendance time and work time. 3. Daily Time Sheet: Each worker is daily issued a time sheet in which the time spent on each job during the day is recorded. This sheet must be completed on the same day and handed over to the foreman for signature. The main drawback of this method is that it needs a lot of paperwork as considerable amount of time will be taken in preparing time sheets and in consolidating these records for purposes of ascertaining labour cost. However, it is suitable where the workers have to frequently change their jobs in a day, e.g., maintenance workers. 4. Weekly Time Sheet: Weekly time sheets record almost the same information as the daily time sheet. The main difference is that instead of recording the work done for a day only, record of work carried out is entered on a weekly basis. Thus, weekly time sheets need less paperwork as compared to daily time sheets. This method proves useful where the jobs are big and their number is small, e.g., building and construction work and interior decoration. The entries in the weekly time sheets may not be accurate as some workers may make entries for two/three days together at one sitting and in the process may forget time spent on certain jobs. 5. Piece Work Card: This card is allotted to a worker who is paid on piece basis. This card may be made either for each individual job or for recording the work done on several jobs. If group system of piece work is in vogue, the card may be allotted to each group of workers. Though piece rate workers are paid on the basis of number of units produced and not on the basis of time taken, recording their time spent on different jobs is essential, particularly where overheads are absorbed on the basis of labour hours. Moreover, it ensures that piece workers do not cause any interruption in production by their late arrival or early departure.

Labour Cost Control NOTES Self-Instructional Material 89 Check

Your Progress 3. State the main function of the time-keeping department. 4. What is the main drawback of the daily time sheet? 5.4 TREATMENT OF IDLE TIME AND OVERTIME COST This falls under the purview of payroll department. Idle Time

Idle time represents time lost by workers who are paid on time basis. When workers are paid on time basis, some difference between the time for which they are paid and that which they actually spend on production is bound to arise. This difference is known as idle time. Idle time

is defined as 'the difference between the time for which employees are paid and the employees' time booked against the cost object.' It

represents the time for which they are paid but no production is obtained. For example, time lost between factory gate and the department, time when production is interrupted

by machine maintenance, allowable time-offs such as rest intervals, tea breaks, etc. Causes

Idle time may occur owing to productive, administrative or economic causes. 1. Productive causes: The productive causes are those which result in loss of production. These include: (a) Idle time due to machine breakdown (b) Power failures (c) Waiting for tools and/or raw materials (d) Waiting for work (e) Waiting for instructions Idle time due to productive causes is usually controllable by proper planning, strict supervision and proper maintenance of plant and machinery. 2. Administrative causes: Idle time is sometimes caused by administrative decisions. Thus, when there is surplus capacity of plant and machinery, which the management decides not to utilize, there may be some idle time due to administrative decisions. This usually happens during depressions when some of the machines have got to work below normal capacity and the regular workers are paid full amount of wages. This is because the management does not want to discharge trained workers temporarily. Such idle time arises out of abnormal situations and is generally not controllable.

Labour Cost Control NOTES Self-Instructional 90 Material 3.

Economic causes: Idle time may also be caused by fall in the demand of products, say due to severe competition, seasonal nature of certain industries like woollen goods, ice-cream, etc., where production cannot be evenly distributed throughout the year. In such cases, it is not possible to get rid of workers during slack season. Such surplus labour force is usually utilized for doing some other jobs and if such complementary jobs cannot be found, there will be some idle time which is beyond control. Treatment of Idle Time From the point of view of treatment in cost accounts, idle time is classified as normal and abnormal. Normal idle time: This is that wastage of labour time which cannot be avoided and has to be borne by the employer. For example: (a) The time which elapses between the completion of one job and the commencement of the next. (b)

The time taken in going from the factory gate to the department

in which the worker is engaged. (c) Personal needs, tea breaks, rest intervals, etc. (d) Time spent in setting machines, etc.

The cost of normal idle time may be treated in one of the following two ways: (i) As overhead cost it may be charged to factory overheads. For this purpose, idle time is allotted a separate standing order number. This helps in its effective control. (ii) As direct wages The wage rate may be inflated to make allowance for normal loss of labour time. Thus, if a worker's production time is only 7 hours during an 8 hours day and his hourly rate of pay is `20, the inflated wage rate will be: 8

hrs 7 hrs x `20 = `22.86

per hour.. The second method is not considered very desirable as the cost of idle time should be treated separately instead of being absorbed as a part of direct labour cost. In this way, it can prove more helpful for the purpose of controlling and reducing it to the minimum.

Abnormal idle time: This is that idle time which arises due to reasons in no way connected with the usual routine of manufacture and for which employer must pay. For example: (a) Time lost due to breakdown of machinery (b) Strikes and lockouts (c) Time lost in waiting for tools and/or raw materials (d) Accidents, etc.

Labour Cost Control NOTES Self-Instructional Material 91

Abnormal idle time is attributed to defective planning, inefficiency or bad luck.

Payment for such idle time is not included in cost and is

transferred to Costing Profit and Loss Account. Control of Idle Time From control point of view, idle time should be divided into controllable and uncontrollable.

Idle time arising due to controllable

causes should be properly analysed and responsibility should be fixed on appropriate individuals.

It is advisable to prepare an Idle Time Card showing the analysis of idle time so that action may be taken, where necessary.

The following steps

may be taken to control idle time: (

a)

Production should be properly planned so that imbalances in production are avoided or reduced. (b) Repairs and maintenance of plant and machinery should be regularly undertaken to avoid breakdown. (c) Raw materials, tools and instructions should reach the worker well in

time so

that no time is wasted in waiting for them. (d) Supervision should be tightened.

Overtime Overtime occurs when a worker works beyond normal working hours. The normal working hours are laid down in the Factories Act. Accordingly, any worker working for more than 9 hours per day or more than 48 hours per week is entitled to

overtime payment. The Factories Act also provides for payment of overtime wages at double the normal rates of wages.

Overtime is defined 'as the time spent beyond normal working hours, which is usually paid at higher rate than the normal time rate.' The extra amount beyond normal wages

and salaries is called overtime premium. The overtime work is, therefore, a costly affair and should be avoided as far as possible due to the following disadvantages attached to it. Disadvantages of Overtime (a) It leads to excessive labour cost. (b) During overtime hours, labour productivity is decreased because of diminishing labour efficiency. (c) It puts an extra strain on plant and machinery. (d) It has a bad effect on the health of workers. (e) Certain overheads, like lighting cost, increase because of work in the evening. (f) Workers may develop a tendency to work in overtime and take overtime wages as a part of their normal earnings. (g) If overtime work is not properly distributed among the workers, it may lead to discontent.

Labour Cost Control NOTES Self-Instructional 92 Material

Treatment of Overtime Payment for overtime consists of two elements: (a) Normal amount of wages, salaries, etc. (b) Additional amount expended on overtime work, i.e., overtime premium. This is over and above the normal amount of wages and salaries. The normal amount of wages is charged to the cost unit or production order on which the worker is working. The difficulty lies in the treatment of overtime premium. This overtime premium is charged differently, under different circumstances, as follows: 1. When overtime is job specific: When overtime is spent on a specific job at the request of a customer due to urgency of work and the customer agrees to the entire charge of overtime premium, it should be charged to the job or work order concerned. 2. When overtime is due to general pressure: When a business receives more orders than it can cope with in the normal working hours and there is general pressure of work, it may be treated by one of the following two methods: (i) Treat overtime premium as direct labour cost by inflating the wage rate and charging to different jobs at the inflated/average rate. (ii) Alternatively, it may be treated as indirect wages and included in overheads. 3. When overtime is due to abnormal reasons: Overtime arising due to abnormal factors, like accident, power failure, fire and machine breakdown, or due to factors like defective planning or faulty management, it should not be included in the cost of products and it should be charged to costing Profit and Loss Account.

Control of Overtime In order to keep the overtime premium

to the minimum, proper control must be exercised on it. The following steps should be taken for this purpose: (

a) All overtime work should be duly authorized by the

Works Manager. (b) Overtime cost should be separately

recorded for each department for proper planning in future. (c) Total overtime premium should be regularly reported to

the Works Manager. (d) When overtime becomes a permanent feature, say, due to shortage of plant capacity, steps may

be taken to install additional plant and machinery or introduce

an additional shift to cope with additional work.

Labour Cost Control NOTES Self-Instructional Material 93

Check Your Progress 5.

How is payment for abnormal idle time dealt with? 6. What

are the two elements of payment for overtime? 5.5

WAGE RATES FOR COSTING AND SYSTEMS OF WAGE PAYMENT The cost accounting department collects and analyses all costs relating to labour. For this purpose, it makes use of clock cards, job cards, daily or weekly time sheets, payroll sheets, etc. The cost accounting department is also responsible for presenting clear and well-designed reports on labour. Each report should furnish information in the most practical manner. Such reports relate to normal and abnormal idle time, overtime, department labour costs, variances from budgeted labour costs, etc. Special reports may be prepared to inform the management of the effectiveness of labour policies and steps that need to be taken for proper control of labour costs. Wages Analysis Sheet or Wages Abstract

The analysis of labour cost is made on a document known as Wages Analysis Sheet or Wages Abstract.

The purpose of this is similar to that of Material Analysis Sheet. Total labour cost is usually analysed into direct and

indirect. In the wages analysis sheet, amount appearing against job number constitutes direct labour cost of jobs. The

indirect labour cost has been given separately. The total of the direct and indirect labour cost is reconciled with the total

wages as per the wages sheet of the period. Labour

remuneration

The term 'remuneration' is used to cover the total monetary earnings of employees. It includes wages according to time or piece basis and other financial incentives. The efficiency in production can be increased by using improved

equipment, by more effective utilization of plant and by adoption of better methods of production, but the most

important contribution must come from labour. Accordingly, the methods of remuneration of labour should be so

designed as to encourage workers to do their best. Methods of remuneration which allow high wages to be paid have

the effect of increasing labour cost but may also result in

Labour Cost Control NOTES Self-Instructional 94 Material

increased production and productivity, thereby reducing the labour cost per unit. On the other hand, low wages

generally result in high labour cost per unit due to lower productivity, high rate of labour turnover, etc.

Requisites of a Satisfactory System of Labour Remuneration Before deciding on a particular system of labour

remuneration, the following factors should be taken into account: 1.

The system should be such as will produce the best quality and quantity of work. 2. It should be satisfactory from the point of view of both employer and employee and reward should be related to effort. 3. The scheme should be clearly defined and intelligible to workers. The workers should be able to calculate wages on their own. If the workers do not understand the system, they may view it with suspicion. 4. It should guarantee a minimum living wage to each worker, irrespective of his efficiency. 5. No maximum limit should be placed on the amount of individual earnings. 6. The earnings of the workers should not be affected by matters beyond their control. They should not, for example, be penalized for production losses due to power failure, machine breakdown, etc., for which they are not responsible. 7. It should reduce labour turnover and labour absenteeism. 8. The system should be flexible so that changes may be introduced as and when necessary. 9. The system should be capable of operation without excessive clerical work. Those methods should be avoided which demand much detailed recording of time, quantity of output, etc. 10. If possible, the system adopted should be one which is in vogue in that particular industry or in that particular locality. Systems of Wage Payment

There are two basic methods of labour remuneration: (a) Time Rate System (b) Piece Rate System

In addition, there are a number of incentive plans to induce workers to work hard so as to produce more and earn more. Labour Cost Control NOTES Self-Instructional Material 95 Fig. 5.1 Methods of Labour Remuneration 5.5.1 Time Rate and Piece Rate System You will first study the concepts of time rate and piece rate systems.

Time Rate System Under time rate system, workers are paid according to the time for which they work. Payment may be on hourly basis, daily basis or monthly

basis. In this system, no consideration is given to the quantity and quality of work done. When payment is made on hourly basis, total wages payable are calculated as follows: $\text{Wages} = \text{No. of hours worked} \times \text{Rate per hour}$ For example, if a worker is paid at the rate of ₹ 25 per hour, his wages for a day of 8 hours will be: $8 \text{ hours} \times ₹ 25 = ₹ 200$. Though this is the oldest system of wage payment, it is still commonly used these days. Suitability:

Time wage system is suitable for the following type of situations: (i) Where quality of work is more important than quantity,

e.g., high class tailoring. (ii) Where output cannot be measured in quantitative terms, e.g., in the case of indirect workers, like watchman, cleaners and sweepers (iii) Where output is beyond the control of the worker, e.g., in process industries the flow of work is regulated by the speed of conveyor belt or where the work of a worker is dependent on the work of other workers. (iv) Where work is being

done on a small scale so that close supervision is possible. (v) Where the worker is a learner or an apprentice.

Labour Cost Control NOTES Self-Instructional 96 Material

Advantages:

The main advantages of time rate system are: 1. **Simplicity:** The system is simple and calculation of wages is easily understood by the workers. 2. **Security to workers:** Workers are assured of a certain amount of wages payable even if there is stoppage of work due to power failure, machine breakdown, etc. This gives a sense of security to workers. 3. **Quality of work:** As this method does not give weight to the quantity of work done, workers can concentrate on the quality of goods produced. Thus, the quality of work under this method is better. 4. **Accepted by trade unions:** Trade unions mostly favour this method because it treats all workers alike and no distinction is made between efficient and inefficient workers. 5. **Economical:** Under this method, no detailed records are required to be maintained regarding the work done by workers. This results in saving of clerical costs. Moreover, workers avoid over-speeding and cause less damage to plant and machinery and also materials. This also results in economy. **Disadvantages:**

The main disadvantages are: 1. **No incentive:** It offers no positive inducement to workers to improve performance as it does not distinguish between efficient and inefficient workers. 2. **Low quantity:** When workers are paid on time basis, they tend to be slow in work. This results in lower production quantity. 3. **Extra supervision costs:** Under this method, extra supervision is needed so that workers do not waste time. Appointment of additional supervisors increases cost. 4.

Costing difficulties:

From costing point of view, it creates difficulties in the calculation of labour cost per unit because the output is constantly, fluctuating. 5.

Idle time: Workers waste a lot of time, resulting in increase in idle time.

Piece Rate System Wages under this system are paid according to the quantity of work done. A rate is fixed per unit of production and wages are calculated by the following formula: $\text{Wages} = \text{Rate per unit} \times \text{No. of units produced}$ For instance, if rate per unit is ₹ 17 and during a day a worker has completed 10 units, then his wages will be $₹ 17 \times 10 \text{ units} = ₹ 170$. This method does not give any consideration to the time taken by the worker in completing the work. Only quantity of work is taken into account for calculating wages.

Labour Cost Control NOTES Self-Instructional Material 97

Suitability of piece rate system: Conditions under which piece rates may be usefully employed are: (a) Where production is standardized and repetitive in nature (b) When the aim is continuous maximum production (c) Where the output of workers can be measured (d) Where workers continue at the same job for long periods (e) Where the standard time required

to complete

a job can be measured accurately Advantages: Piece rate system has the following advantages: 1. Incentive to efficient workers: As remuneration is in proportion to the worker's effort, the method provides a strong incentive to work more. 2. Increase in production: Each worker tries his best to produce more to earn higher wages. This results in increase in production. 3. Lower cost: On account of increase in production, fixed cost per unit is reduced resulting in higher profit. 4. Equitable: This system is more equitable than time rate system because wages are paid according to the efficiency of each worker. 5. Decrease in the need for supervision: Strict supervision is not necessary because the workers are themselves interested in maximizing their earnings through the maximization of output. 6. Simplifies costing: As wages are paid at a rate per unit, this method simplifies cost ascertainment because labour cost per unit is known in advance. 7. Simple and easy: This method is simple and is easily understood by the workers. Disadvantages: Piece rate system suffers from the following limitations: 1. Poor quality of work: This method lays too much emphasis on quantity of production and ignores quality of work. In order to maximize their wages, workers may try to produce more and more without caring for the quality of production. 2. No security of wages: This system does not guarantee a minimum wage to a worker. If a worker is not able to complete his day's work, for any reason, he is paid less wages. Thus, earnings of workers are uncertain. 3. Misuse of materials and equipment: In the greed to produce more, workers may cause wastage of materials and damage to plant and machinery. 4. Injurious to health of workers: In an effort to earn more wages, workers try to work excessively and with speed. This proves injurious to the health of workers.

Labour Cost Control NOTES Self-Instructional 98 Material 5.

Opposed by trade unions: Piece rate system is generally opposed by trade unions because it creates inequality in the wages of workers. Slow and inefficient workers feel jealous of the higher wages of their fellow workers. 6. Difficulties in fixing piece rate: Fixing equitable piece rate is quite a difficult task and may require considerable amount of work in the form of time studies. 7. Unsuitable in certain cases: This method does not suit where work is of artistic and refined natures. 5.5.2

Incentive Plans Both time rate system and piece rate system, discussed above, have their merits and demerits. Incentive plans attempt to combine the good points of both the systems.

The primary purpose of an

incentive plan is to induce a worker to produce more to earn

a higher wage. Naturally, producing more in the same period of time should result in higher pay for the worker. Because of greater number of units produced, it should also result in a lower cost per unit for fixed factory cost and also for labour cost.

Principles of a Good Incentive Scheme A good incentive scheme should have the following features: 1.

The scheme should be simple and easily understandable by workers

so that a worker should be able to calculate his own wage easily. 2.

The scheme should be fair to both employer and employee.

It should link reward with effort. 3.

The cost of operating the scheme should be reasonably low. 4. The standard of performance should be scientifically set and should be within the reasonable reach of an average worker. 5. No upper limit should be put on the earnings of workers. 6. The scheme should have the approval of workers and the union. 7.

No worker should suffer a deduction of earnings for factors beyond his control such as machine breakdown, power failure, etc. 8.

The scheme should provide a satisfactory system of supervision and production control. 9. The scheme should be conducive to the setting up of standard costs and budgetary control. 10. Standards once set should not be changed unless there is a change in the method of production or other factors. 11. The scheme must be relatively permanent and should not be frequently changed.

Labour Cost Control NOTES Self-Instructional Material 99 12.

Indirect workers should also be included under the incentive scheme. 13. Workers should be properly educated about the scheme and motivated to attain high standards. (

a) Individual

Incentive Plans 1.

Halsey Premium Plan This plan was introduced by F A Halsey in 1891. It is a simple combination of time and piece

rate systems. The main features of this plan are as follows: (a) Workers are paid at a rate per hour for the actual time taken by them. (b) A standard time is set for each piece of work, job or operation. (c) If a worker takes standard time or more than the standard time to complete his work, he is paid wages for the actual time taken by him at the time rate. In other words, time wages are guaranteed. (

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

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

Example: Standard time (or Allowed time) = 50 hours Wage rate per hour = ₹ Actual time taken = 42 hours Thus, time saved = 50 hrs – 42 hrs = 8 hours Earnings = ₹ × 42 hrs + 50% of (8 hrs × ₹) = ₹126 + 12 = ₹138 2.

Halsey Weir Plan This method is precisely the same as Halsey Plan except that in Halsey Weir Plan the bonus is equal to 30% of the time saved. 3. Rowan Plan This plan is also similar to Halsey Plan except in the calculation of bonus.

The main features of Rowan Plan are as follows: (a) Wages are paid on time basis for the actual time worked by the workers. (b) A standard time is determined for each piece of work or job. (c) If a worker completes his work in standard time or in more than the standard time, he is paid wages for the time actually taken by him.

Labour Cost Control NOTES Self-Instructional 100 Material (

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

Bonus is that proportion of wages of actual time taken which the time saved bears to the standard time.

Its formula is:

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

Earnings = (Time taken × Time rate) + Bonus

Example: Standard time = 50 hours Wage rate per hour = ₹ Actual time taken = 42 hours

Calculate earnings and bonus under Rowan Plan. Time Saved=50 hrs – 42 hrs = 8 hours Bonus = 8

hrs 50 hrs × 42 hours × ₹ = ₹20.16 Earnings = (Time taken ×

Time rate) + Bonus = (42 hrs × ₹) + ₹20.16 = ₹146.16 4.

Taylor's Differential Piece Rate System This system was introduced by F W Taylor, the father of scientific management.

The main features of this

incentive plan are as follows: (a) Day wages are not guaranteed, i.e., it does not assure any minimum amount of wages to workers. (b) A standard time for each job is set very carefully after time and motion studies. (c) Two piece rates are set for each job—the lower rate and the higher

rate. The lower piece rate is payable where a worker takes a longer time than the standard time

to complete the work. Higher rate is payable when a worker completes the work within the standard time. In other

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

Example: Standard production = 8 units per hour Working hours per day = 8 hours

Labour Cost Control NOTES Self-Instructional Material 101 Lower rate = ₹5 per unit Higher rate = ₹8.75 per unit Worker X

produces = 7 units Worker Y produces = 9 units Wages of worker X and Y under Taylor's plan will be as follows: Worker X

– He has produced 7 units which is below standard. He will, therefore, be paid at the lower rate of ₹5 per unit. His wages

will be 7 units @ ₹5 = ₹35. Worker Y – He has produced 9 units which is above standard. He will, therefore, be paid at the

higher rate. His wages will be 9 units @ ₹8.75 = ₹78.75. It will be seen that there is a great difference between the wages

of an efficient and an inefficient worker. 5.

Merrick's Differential Piece Rate System (Multiple Piece Rate System) This is a modification of Taylor's plan. While Taylor prescribed two rates, Merrick's plan lays down three rates. The lowest rate is for the beginners, the middle rate is for the developing workers and the highest rate is for the highly efficient workers. Efficiency of the workers is determined in terms of percentages.

Thus,

the rates of remuneration are: Level of efficiency Piece rate Upto 83% Ordinary

piece rate 83% to 100% 110% of

ordinary

piece rate Above 100% 120% of ordinary piece rate

Like Taylor's plan, this method also does not guarantee minimum wages. The general criticism levelled against Taylor's plan also applies to it except that it lessens the punitive character of Taylor's plan. 6.

Gantt's Task and Bonus

Plan The main features of this plan are as follows: (

a)

Day wages on time basis are guaranteed to all workers. (b)

This plan

is a combination of time rate, differential piece rate and bonus. (c) A standard is set and

remuneration is calculated as follows: (i) When output is below standard—payment at time rate. (ii) When output is at standard—payment at time rate plus 20% bonus. (iii) When output is above standard—payment at high piece rate.

Example: Calculate the earnings of

X, Y and Z when their output, in a day of 8 hours, is X–75 units, Y–80 units and Z–85 units respectively. Guaranteed time rate is `20 per hour and standard output is 10 units per hour. High piece rate is fixed at `3.50.

Labour Cost Control NOTES Self-Instructional 102 Material Solution: Standard output in 8 hours = 10 × 8 = 80 units

Earnings of X: His output is below standard and thus he will be paid at time rate. X's earnings = 8 hours × `20 = `160

Earnings of Y: His output is at standard and thus he is entitled to a bonus of 20% on time rate. His rate per hour is `20 + 20% = `24 Y's earnings = 8 hours × `24 = `192

Earnings of Z: His output is above standard and thus he will be paid at the high piece rate. Z's earnings = 85 units × `3.50 = `297.50

The advantage of Gantt's Task and Bonus Plan is that

it provides security for the less efficient and a high incentive for a more efficient worker. Calculation of wages under this plan is also simple to understand. 7.

Emerson's Efficiency Plan This scheme is designed to give encouragement to the slow workers to perform better than before. Time wages are guaranteed. The standard output in this plan

is fixed to represent 100% efficiency. A bonus is paid to a worker whose

efficiency exceeds 66%. As efficiency increases, the bonus also increases gradually in steps,

at a stated rate, so that at 100% efficiency, bonus would rise to 20%

of wages. Beyond 100% the bonus increases at 1% of the basic rate for each 1per cent increase in efficiency. It can thus,

be shown as below in a tabular form: Efficiency Bonus (a) Below 66 2 3 % No bonus (Only time wages) (b) 66 2 3 % to

100% Bonus increases in steps and rises to 20% at 100% efficiency (c) Over 100% 20% bonus plus 1% bonus

for each increase of 1% in efficiency

Example:

Standard output in 8 hours = 60 units Actual output in 8 hours = 72 units

Time rate = `2 per hour

Calculate the

earnings under Emerson's plan. Efficiency in % = $\frac{72}{60} \times 100 = 120\%$

Labour Cost Control NOTES Self-Instructional Material 103 Bonus % = 20% + 20% = 40% Time wages = 8 hours @ `2 =

`16.00 Add: Bonus 40% of `16 = `6.40 Total earnings `22.40 In this example, if the actual output of worker is upto 40

units, i.e., 66 2 3 efficiency, he will not get any bonus and his wages will be simply time wages, i.e., 8 hours × `2 = `16.

The worker will start earning bonus if his output in 8 hours is above 40 units. If he produces 60 units, i.e., when his

efficiency is 100%, his total earnings will be: Total earnings = Time wages + Bonus = (8 hrs × `2) + 20% = 16 + 3.20 =

`19.20 8.

Bedaux Plan In this plan, standard time of each job is determined in minutes known as Bedaux points or B's. One B unit represents the amount of work which an average worker can do under ordinary conditions in one minute. The standard

time is determined by work study and each job is assigned a number of B's. Under this system, the worker receives his

daily or hourly rate plus 75 per cent of the points saved, multiplied by one sixtieth of his hourly rate. The remaining

balance of 25 per cent is paid to supervisors and indirect workers. Thus: Bonus = ? ?

No. of 's saved hourly rate 75 60 100

B

Earnings = (Hours worked × Hourly rate) + Bonus

Example: Standard time for job = 600 B's Hourly rate `2, Time taken 8 hours, i.e., 480 minutes Points or B's saved = 600

– 480 = 120 Bonus = ? ? $\frac{120}{275} \times 60 \times 100 = `3$ Earnings = (8 hours × `2) + `3 bonus = `19 If the worker takes 12 hours to

complete the job, i.e. more than the standard time, he will be paid for the actual time taken, i.e. 12 hrs × `2 = `24.

Time wages are thus guaranteed to those who are not able to save any points. It may be noted that the Bedaux Plan is not different from the Halsey Plan

Labour Cost Control NOTES Self-Instructional 104 Material

except that bonus is 75 per cent of the time saved instead of 50 per cent. The system is particularly suitable where output can be measured with greater accuracy and conditions are standardized. To make the system a success, very accurate time study is required for each operation to set standard time in terms of standard minutes. (

b) Group Bonus Plans In the schemes discussed so far, the bonus to be paid has been calculated on the basis of individual worker's performance. But there are certain jobs or operations which are required to be done collectively, by a group of workers. In continuous production, for example, work flows in a sequence or in assembly work for televisions, radios, scooters, etc., a team of workers is engaged on various operations. As such, it becomes necessary to introduce bonus schemes for collective efficiency of the group as a whole. The intention is to create a collective interest in the work. The total bonus determined is distributed among the members of the group on an equitable basis. The following bases of distribution are commonly used: (a) Equal distribution, if skill and grade of workers in the group is uniform (b) On the basis of time wages of each worker (c) In proportion to the time rate of each worker, where each worker has devoted equal time (d) In a fixed ratio determined in advance on the basis of merit rating Suitability: Group bonus schemes may be usefully employed in the following circumstances: (a) Where it is not possible to measure the performance of each individual worker (b) Where the workers constituting a group possess the same or equal skill and efficiency (c) Where the number of workers constituting a group is not very large (d) Where production is dependent on the collective effort of a group of workers as a whole

Types of Group

Incentive Plans 1. Priestman Plan This plan was first used by M/s Priestman Bros Ltd of Hull in 1917. According to this plan, a standard is set for the output to be achieved weekly by a factory as a whole. This standard may be in terms of units or points (Bedaux Plan). The actual output of the factory is compared with the standard and if actual exceeds standard, the employees are paid a bonus in proportion to the increase.

Labour Cost Control NOTES Self-Instructional Material 105 2.

Towne Plan This plan was introduced in 1886 by Towne in the United States of America. Under this plan, actual labour cost is compared with the predetermined standard set for labour cost. If the labour cost is less than the standard so set, 50% of the saving so effected is distributed as bonus to individual workers prorata with the wages earned. The supervisory staff also gets a part of this bonus and thus encouragement is provided to reduce cost. 3. Rucker Plan (Share of Production Plan) Under this plan, labour receives a constant proportion of the 'added value'. The term 'added value' is defined by CIMA as 'the change in market value resulting from an alteration in the form, location or availability of a product or service, excluding the cost of bought-out materials or services.' Value added is not the same thing as conversion cost as it also includes profit. In this plan, ratio of wages to added value is determined and if the ratio of wages reduces because of increase in added value, bonus payment is made to bring the reduced wage ratio in level with the predetermined ratio. (

c) Incentive plans for indirect workers As it is difficult to measure the output of indirect workers, they are generally excluded from the incentive plans. But indirect workers are as essential for production as direct workers and as such, full increase in production cannot be obtained without the cooperation of indirect workers. Therefore, incentive plans may be introduced for indirect workers either to increase the efficiency of the services they provide to direct workers or to induce foremen and supervisors to increase departmental efficiency and thus, reduce costs. Also payment of bonus to indirect workers, when it is also being paid to direct workers, will prevent labour unrest. Bases of Payment of Bonus to Indirect Workers The indirect workers may be paid a bonus on any one of the following bases: 1. Where indirect workers serve a group of direct workers, they may be paid a bonus on the basis of performance of the group of direct workers whom they serve, e.g., maintenance workers attached to a particular department. 2. When indirect workers provide general services, e.g., sweeping and storekeeping, bonus may be paid on the basis of the output of the whole factory. 3. On the basis of job evaluation and merit rating of indirect workers. 4. On some arbitrary basis, like enhanced day rate so as to include an element of bonus in the rate itself.

Labour Cost Control NOTES Self-Instructional 106 Material (d) Co-partnership and Profit sharing Co-partnership or co-ownership is a scheme whereby employees are given

an opportunity to share in the capital of the business and to receive a part of the profit that accrues to their share of ownership. Some companies provide loans to employees to buy shares, while others reserve a specified number of shares for allotment to employees. Under the profit-sharing schemes, the workers are paid in addition to wages, a predetermined share of the profits of the undertaking. In India, workers' share is governed by the Payment of Bonus Act, 1965.

A co-partnership scheme may be arranged in conjunction with a profit sharing scheme, whereby the bonus to workers is to be retained as an investment in the company. This investment may be in the form of special shares, not carrying voting rights but entitled to a fixed dividend or it may be

in the form of a loan carrying higher rate of interest.

Both co-partnership and profit-sharing schemes enable the workers to share in the prosperity of the business as a whole and give them a tangible interest in its future. (e) Non-monetary incentives Workers are sometimes provided with certain incentives, not in the form of higher wages but in terms of favourable conditions of employment. Such incentives are given in the form of better amenities or facilities. Range of such incentives is extremely wide. Some such benefits are completely free, while in certain benefits there may be a partial contribution by employees.

Non-monetary incentives help in attracting better workers, reduce labour turnover and absenteeism, promote better industrial relations, encourage loyalty and keep the workers happy and satisfied.

Examples of non-monetary incentives are free medical facilities, free education to the workers' children, housing facilities, transport facilities, subsidized meals in canteens, superannuation and pension schemes, sports and recreation facilities, etc.

Check Your Progress 7.

State two advantages of piece rate system. 8.

Name the incentive plan in which three rates are prescribed.

Labour Cost Control NOTES Self-Instructional Material 107 5.6

ANSWERS TO CHECK YOUR PROGRESS QUESTIONS 1. The three methods of calculating rate are: ? Separation method ?

Replacement method ? Flux method 2. The avoidable causes of labour turnover are: ?

Low wages and allowances ? Unhappy relations with co-workers and supervisors ? Unsatisfactory working conditions ?

Trade union rivalry ? Lack of medical facilities, transport facilities, etc ? Inadequate job security and retirement benefits 3.

The main function of the time-keeping

department is to accurately record each worker's time of arrival and departure in the factory and also the time spent on different jobs or processes. 4.

The main drawback of the daily time sheet

is that it needs a lot of paperwork as considerable amount of time will be taken in preparing time sheets and in consolidating these records for purposes of ascertaining labour cost. 5.

The payment for abnormal

idle time is not included in cost and is

transferred to Costing Profit and Loss Account. 6.

Payment for overtime consists of two elements: (a) Normal amount of wages, salaries, etc. (b) Additional amount expended on overtime work, i.e., overtime premium 7.

Two

advantages of piece rate system are: ? Incentive to efficient workers: As remuneration is in proportion to the worker's effort, the method provides a strong incentive to work more. ? Increase in production: Each worker tries his best to produce more to earn higher wages. This results in increase in production. 8.

It is Merrick's Differential Piece Rate System, in which three rates are prescribed.

The lowest rate is for the beginners, the middle rate is for the developing workers and the highest rate is for the highly efficient workers.

Labour Cost Control NOTES Self-Instructional 108 Material 5.7

SUMMARY ?

In all business organizations, it is a common feature that some workers leave the employment and new workers join in place of those leaving; this change in workforce is known as labour turnover. ?

Total number of workers joining, including replacements, is called accession; the labour turnover rate in such a case may be calculated in respect of workers joining (accession) the organization during the period which includes all workers joining due to replacements and also due to expansion. ?

Labour turnover reports should be prepared regularly to be placed before the management, giving a breakdown of the causes as to why the workers left. ?

The

cost of labour turnover may be broadly classified into two broad categories—(i) Preventive costs, and (ii) Replacement costs. ?

The preventive cost of labour turnover should be apportioned to various departments on the basis of number of workers in each department. ?

Work measurement is a technique of establishing normal or standard times after standardization of methods and establishment of a measure for the work contents of jobs or operations. ? Job analysis is the process of determining the tasks which comprise the job and the skills, knowledge, abilities and responsibilities required of the worker for its successful performance. ?

The time-keeping department is an important part of a firm's system of accounting and control of labour cost; the main function is to accurately record each worker's time of arrival and departure in the factory and also the time spent on different jobs or processes. ?

There are mainly three methods for recording attendance of workers: (i) attendance register, (ii) token or disc method, and (iii) time recording clocks. ? The appointment of casual workers is a very common source of fraud in the payment of wages; it is, therefore, very important to have a proper control over their appointments, their time of work and payment of their wages. ?

Idle time due to productive causes is usually controllable by proper planning, strict supervision and proper maintenance of plant and machinery. ?

According to

the Factories Act, any worker working for more than 9 hours per day or more than 48 hours per week is entitled to overtime payment; the Act also provides for payment of overtime wages at double the normal rates of wages.

Labour Cost

Control NOTES Self-Instructional Material 109 ?

The cost of paid leave cannot be charged to any work order or cost unit since no work is done during this period. It is, therefore, treated as indirect labour cost and charged to overheads. ? The analysis of labour cost is made on a document known as Wages Analysis Sheet or Wages Abstract. ?

Methods of remuneration which allow high wages to be paid have the effect of increasing labour cost but may also result in increased production and productivity, thereby reducing the labour cost per unit. ?

Under

time rate system, workers are paid according to the time for which they work;

and payment may be on hourly basis, daily basis or monthly basis. ? Under Halsey Plan and Rowan Plan, earnings per hour of workers keep on increasing. ? To make the Bedaux plan

system a success, very accurate time study is required for each operation to set standard time in terms of standard minutes. ?

In Rucker plan, ratio of wages to added value is determined and if the ratio of wages reduces because of increase in added value, bonus payment is made to bring the reduced wage ratio in level with the

pre-determined ratio. ? A co-partnership scheme may be arranged in conjunction with a profit sharing scheme, whereby the bonus to workers is to be retained as an investment in the company; the investment may be in the form of special shares not carrying voting rights but entitled to a fixed dividend or in the form of a loan carrying higher rate of interest. ?

Non-monetary incentives help in attracting better workers, reduce labour turnover and absenteeism, promote better industrial relations, encourage loyalty and keep the workers happy and satisfied. ? The three methods of recording

attendance of workers include - attendance register, token or disc method and time recording clocks. 5.8 KEY WORDS ?

Flux Method: This shows

the total change in the composition of labour force due to separations and replacement of workers. ?

Idle Time: It represents time lost by workers who are paid on time basis. ?

Preventive Costs: These costs are incurred to keep the workforce satisfied and to prevent or discourage them from leaving the organization.

Labour Cost Control NOTES Self-Instructional 110 Material 5.9

SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer

Questions 1. How is labour turnover measured? 2. What are the causes of labour turnover? 3.

Distinguish between time keeping and time booking. 4. What is the treatment of overtime? Long Answer Questions 1.

Discuss labour turnover due to new recruitment. 2. Describe the effect, costs, reduction and control of labour turnover. 3. From the following information, calculate the

labour turnover rate

and

labour flux rate: ?

Number of workers at the beginning of the year 3,800 ? Number of workers at the end of the year 4,200

During the year, 40

workers

leave while 160 workers are discharged. 600 workers are recruited during the year. Of these, 150 workers are recruited because of leavers and the rest are engaged in accordance with an expansion

scheme. 4.

Discuss, in detail, the methods of time-booking. 5. Distinguish between time wage system and piece wage system. State their relative merits and demerits. 6.

Examine the concept and treatment of idle time. Explain the following methods of wage payment: ? Taylor's Different Piece Rate System ? Rowan Scheme ? Emerson's Efficiency Plan 7.

Explain the methods and records of time keeping. What are the functions of time keeping records? 5.10 FURTHER READINGS

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Overhead Cost Control NOTES Self-Instructional 112 Material UNIT 6 OVERHEAD COST CONTROL Structure 6.0
Introduction 6.1 Objectives 6.2 Classification
of
Overheads 6.3 Allocation, Apportionment and Methods 6.4

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Absorption of Overheads and Its Methods 6.4.1 Types of Overhead Rates 6.5 Administration, Selling and Distribution
Overheads 6.6 Under-Absorption and Over-Absorption of Overheads 6.7

Answers to Check Your Progress Questions 6.8 Summary 6.9 Key Words 6.10 Self Assessment Questions and Exercises
6.11 Further Readings 6.0 INTRODUCTION

Total cost may be classified into direct cost and indirect cost. The total of all direct costs (i.e., direct material cost, direct labour cost and direct expenses) is known as Prime cost

and

the total of all indirect costs (i.e., indirect material cost, indirect labour cost and indirect expenses) is termed as Overhead cost. Various other names of overheads are: (a) oncost; (b) supplementary cost; (c) burden; (d) non-productive cost, etc.

Thus, overhead cost is the total of all indirect expenditure. It comprises

those costs which the cost accountant is either unable or unwilling to allocate to particular cost units.

Accounting and control of overhead costs is more complex than that of other elements of cost, i.e., direct materials and direct labour. This is because overheads by definition, are indirect costs which cannot be conveniently allocated to cost units. Hence, there arises the knotty problem of apportioning these indirect costs to cost centres and cost units.

In this unit, you will learn about the classification of overheads along with methods of allocation, apportionment and absorption. 6.1

OBJECTIVES After going through this unit, you will be able to: ? Analyse the classification of overhead costs according to functions, elements and behaviour variability

Overhead Cost Control NOTES

Self-Instructional Material 113 ? Discuss the inclusions of primary and secondary distribution ? Describe the process of the absorption of overheads ? Explain the methods of overhead absorption ? Differentiate between over and under absorption 6.2

CLASSIFICATION OF OVERHEADS

Overhead costs may be classified according to: 1. Functions 2. Elements 3. Behaviour 1.

Classification according to Functions The main groups of overheads on the basis of this classification are as follows: (a) Production overheads: Also termed as factory overheads, works overheads or manufacturing overheads, they are indirect expenditures incurred in connection with production operations. They are the aggregate of factory indirect material cost, indirect wages and indirect expenses.

Unlike direct materials and direct labour, production overheads are an invisible part of the finished product.

Examples of these overheads are: lubricants, consumable stores, indirect wages, factory power and light, depreciation of plant and machinery, depreciation of factory building, insurance of plant and factory building, storekeeping expenses, repairs and maintenance. (b) Administration overheads: These overheads are of general nature and consist of all costs incurred in the direction, control and administration (

including secretarial, accounting and financial control) of an undertaking, which are not related directly to production or selling and distribution function. Examples are: general management salaries, audit fees, legal charges, postage and telephone, stationery and printing, office rent and rates, office lighting and salaries of office staff.

These overheads are also known as office overheads or general overheads. (

c)

Selling and distribution overheads: Selling overheads are the cost of seeking to

create and stimulate demand or of securing orders.

Examples: advertising, salaries and

commission of sales personnel, showroom expenses, travelling expenses, bad debts, catalogues and price lists.

Distribution overheads comprise all expenditures incurred from the time product is completed in the factory till it reaches its destination

or customer. It

includes packing cost, carriage outward, delivery van expenses, warehousing costs, etc. Selling overheads and distribution overheads are both related to sales function and thus are combined into one category of selling and distribution overheads.

Overhead Cost Control NOTES Self-Instructional 114 Material

These are often referred to as 'after production costs' because these costs are incurred after production work is over. 2.

Element-wise Classification Under this method, the classification is done according to the nature and sources of the expenditure. This method follows logically from the definition of overhead costs. On this basis, expenses are classified under three main groups given below: (a) Indirect materials: They are material costs, which

cannot be allocated but which are to

be apportioned to or absorbed by cost centres or cost units.

Examples are

stationery, coal, lubricants and tools for general use. (b) Indirect wages: Indirect wages are those which cannot be allocated but which are to

be apportioned to or absorbed by cost centres or cost units.

Examples are

wages of sweeper, idle time wages, maintenance and repair wages, foreman's pay and chowkidar's pay. (c) Indirect expenses: Expenses which

cannot be allocated but which are to

be apportioned to or absorbed by cost centres or cost units are

indirect expenses.

For example, power, depreciation, insurance, taxes and

rates and rent. 3. Classification according to Behaviour or Variability Different overhead costs behave in different ways

when volume of production changes. On the basis of behaviour, overheads may be classified into: (a) Fixed overheads; (b)

Variable overheads; and (c) Semi-fixed or semi-variable overheads. Fixed overheads: These overheads remain unaffected

or fixed in total amount by fluctuations in volume of output. Examples are rent and rates, managerial salaries, building

depreciation, postage, stationery and legal expenses. Variable overheads: This is the cost which, in aggregate, tends to

vary in direct proportion to changes in the volume of

output.

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Variable overheads per unit remain fixed. Examples are indirect materials, indirect labour, salesmen's commission, power,

light, fuel, etc. Semi-variable overheads: These overheads are partly fixed and partly variable. In other words, semi-variable overhead costs vary in part with the volume of production and in part they are constant, whenever there is a change in volume of production. Examples are supervisory salaries, depreciation, repairs and maintenance, etc.

Importance of Classifying Costs into Fixed and Variable

The fixed-variable cost classification is of great importance in planning, decision making and control as discussed below:

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Preparation of budgets: This classification helps in the preparation of budgets. For instance, when flexible budgets are prepared for different levels

Overhead Cost Control NOTES Self-Instructional Material 115 of activity, the

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fixed cost remains constant at all levels of activity, whereas variable cost varies according to the actual level of

output. 2. Decision making: As most problems of decision making relate to changes in volume, this classification acquires a special importance in managerial decision making. This is so because fixed and variable costs behave in different ways when volume of output changes. 3. Control of costs: From control point of view, cost may be controllable or uncontrollable. The fixed costs are mostly uncontrollable and if any control can be exercised, it can be done by the top management. Variable costs, on the other hand, are mostly controllable. For example, rent of building (fixed) is not easily controllable but cost of materials (variable) may be controlled by purchasing in economical lots, seasonal purchasing, etc. Classifying costs into fixed and variable, therefore, helps in the effective control of costs by pointing out where management should concentrate to control costs. 4. Marginal costing and break-even analysis: This technique is totally dependent on

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segregation of cost into fixed and variable. 5. Absorption of overheads: By classifying costs into fixed and variable, separate rates of absorption of overheads may be used for fixed and variable overheads. The under/over-absorption arising out of two types of overheads are different in nature and need different managerial action.

For example, under-absorption of fixed overheads means the existence of surplus or idle capacity so suitable steps may be taken to effectively utilize idle capacity. 6. Other uses: In addition to points stated above, fixed-variable cost classification is useful in many other areas. For example, while planning capital expenditure, effect of the proposed project on total fixed and variable costs should be studied. Moreover, differential and comparative cost analysis are based on this classification.

Segregation of Semi-variable Costs The main purpose of classifying overhead costs into fixed and variable is to help the management in decision making and control of expenditure As such, the semi- variable costs may present some problems and thus the cost accountant must split them into fixed and variable components. In other words, the extent to which an item of semi-fixed or semi-variable cost is fixed or variable has to be determined. The following methods are used for this purpose: 1.

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High and Low Points Method Under this method, semi-variable costs at various level of output are considered The difference between the highest and the lowest volume of

output and the difference between the corresponding costs are worked out. Then the variable element per unit of output is calculated by applying the following formula: Variable element per unit =

$\frac{\text{Difference in semi-variable costs}}{\text{Difference in output (units)}}$

Overhead Cost Control NOTES Self-Instructional 116 Material 2.

Method of Averages Under this method, data given is divided into two parts.

Then average of output and cost is separately computed for these two parts. Variable element in the cost is then calculated by the following method: Variable

element per unit = $\frac{\text{Difference in the average costs}}{\text{Difference in average output}}$ 3.

Scatter Diagram Method This is a graphic method. Under this method, the

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semi-variable costs incurred at levels of output are plotted on a graph, the X-axis

of which represents the volume of production and Y-axis, the amount of expenditure. After plotting the points on the graph, a straight line is drawn in such a way as to represent an average of all those points. This is known as the line of best fit or line of regression. The point where this line of best fit intersects the X-axis, marks the fixed cost. A line from this point is drawn which is parallel to X-axis. This is fixed cost line. The difference between semi-variable cost line and fixed cost line represents variable component. 4.

Simultaneous Equations Method In

this method, overhead costs are segregated by means of an equation. This equation for a straight line is: $Y = mX + c$
where Y = Total semi-variable cost X = Volume of output c = Fixed cost

m = Slope of variable cost line, i.e., variable cost per unit of output. For the purpose of separating fixed and variable components of the cost, the overhead cost is determined at various levels of output and pairs of values of X and Y are fitted in the above formula in order to compute the values of m and c .

Standing Order Numbers (

Codification of Overheads) After overheads are classified,

it is found useful to allot a number or symbol to each group of expenses so that each such group is easily distinguished from others. Such numbers or symbols are codes for overheads and are called standing order numbers. Each standing order number denotes a particular type of expenditure

so that items of expenses of similar nature, as and when they are incurred, are appropriately classified into one of these. A schedule or manual is maintained enlisting all standing order numbers. There cannot be a standard list of standing order numbers as the number and type under which overheads may be sub-grouped vary with the: (a) size of the factory; (b) type of expenses; and (c) the extent of control necessary.

Overhead Cost Control NOTES Self-Instructional Material 117

Utility Use of code numbers is preferred to lengthy names of overhead items because of the following reasons: 1. It is convenient to write a code number in place of an overhead item. 2. Use of code numbers helps in maintaining secrecy because item name is not revealed at the time of posting and processing of cost data. 3. Clerical effort is reduced as length in description is minimized. 4. Coding is essential in mechanized accounting.

Overheads Distribution Direct costs are charged direct to the cost centres or cost units without difficulty. But this is not possible in overhead costs. Distribution of overhead costs to cost units is one of the most complex problems of cost accounting.

This is because overhead costs cannot be identified with individual cost units and there are no accounting means of exact distribution. Therefore, such costs are analysed and distributed to various cost centres and cost units on arbitrary basis. For example, it is not possible to exactly calculate the amount of rent that should be charged to a particular cost unit and thus, it has to be distributed on some arbitrary basis. The cost accountant is constantly searching for equitable bases to distribute overhead costs to units and divisions of business enterprise and quite often he needs to exercise his own judgement in this regard. For instance, he may apportion rent to various departments of the factory on the basis of area occupied by each such department. Similarly, labour welfare expenses may

be apportioned on the basis of number of workers in each department. The

procedure of distribution of overhead costs is discussed below. Steps in Overheads Distribution Unlike direct materials and direct wages, overheads cannot be charged to cost units directly. The various steps taken for distribution of overhead costs are

as follows: 1. Classification and collection of overheads 2. Allocation and apportionment of overheads to production departments and service departments 3. Re-apportionment of service department costs to production departments 4. Absorption of overheads of

each production department in cost units These steps are explained in detail in the following sections.

Collection of Overheads The procedure of classification of production overheads and of assigning standing order (code) numbers

has already been discussed. Such classification and codification is pre-requisite for the collection of overheads.

Overhead Cost Control NOTES Self-Instructional 118 Material

Production overheads should be collected under standing order numbers. The main sources from which overhead costs are collected are as follows: (a) Invoice—for collection of indirect expenses, like rent, insurance, etc. (b) Stores Requisitions—for collection of indirect materials. (c) Wages Analysis Sheet—for collection of indirect wages. (d) Journal entries—for collection of those overhead items which do not result in current cash outlay and need some adjustment, e.g., depreciation, charge in lieu of rent, outstanding rent, etc.

Check Your Progress 1. What is the other name for production overhead? 2. State the difference between fixed and variable overhead. 6.3

ALLOCATION, APPORTIONMENT AND

METHODS After overhead costs have been collected under various standing order numbers, the next step is to allocate and apportion the overheads to production and service departments. Such allocation and apportionment is known as departmentalization or primary distribution of overheads. Departmentalization of overheads is the process of allocation and apportionment of overheads to different departments or cost centres. For smooth and efficient working, a factory is sub-divided into a number of departments, each of which denotes a particular activity of the factory,

e.g., purchase department, stores department, time-keeping department, personnel department, crushing department and melting shop.

These departments are mainly of two types: (a) Production departments; and (b) Service departments.

These are discussed in the later pages.

Objectives of Departmentalization Departmentalization of overheads serves the following purposes: 1. Ensures greater accuracy in cost ascertainment 2.

Control of overhead costs 3. Use of different methods of absorption 4. Valuation of work-in-progress 5. Cost of service of departments 6. Forecasting and estimating

Overhead Cost Control NOTES Self-Instructional Material 119

Allocation Certain items of overhead costs can be directly identified with a particular department or cost centre as having been incurred for that cost centre. Allotment of such costs to departments or cost centres is known as allocation. Thus, allocation

may be defined as 'the assignment of whole items of cost directly to a cost centre.'

In other words, allocation is

charging to a cost centre those overheads that result solely from the existence of that cost

centre. A point to be clearly understood is that allocation can be made only when exact amount of overheads incurred in a cost centre is

definitely known. For example, rent cannot normally be allocated since rent is payable for the factory as a whole and exact amount of rent for each department cannot be known. Indirect materials, on the other hand, can be easily allocated to various departments in which they are incurred.

Other items which are allocated include indirect wages, overtime and idle time cost, power (when sub-metres are installed in departments), depreciation of machinery, supervision, etc. In

brief, in order that an

overhead can be allocated, they should meet both of the following conditions: (a) The cost centre must have caused the overhead cost to be incurred; and (b) The exact amount incurred in a cost centre must be known. Apportionment

Certain overhead costs cannot be directly charged to a department or cost centre. Such costs are common to a number of cost centres or departments and do not originate from any specific department. Distribution of such overhead costs to various departments is known as apportionment.

Thus,

apportionment may be defined as 'the distribution of overheads to more than one cost centre, on some equitable basis.' In other words, it is charging a fair share of an overhead cost to a cost centre. Where an item of overhead cost is common to various cost centres, it is allotted to different cost centres proportionately. Again taking the cases of rent, as it cannot be allocated, it is apportioned to various departments on some equitable basis, i.e., in the ratio of area occupied.

Similarly salary of a general manager cannot be allocated wholly to any one department as he attends in general to all the departments. It should, therefore, be apportioned to the required departments on some equitable basis. Other items which generally cannot be allocated but are apportioned include fire insurance, lighting and heating, time keeping expenses, canteen expenses, medical and other welfare expenses, etc.

Distinction between Allocation and Apportionment The distinction between allocation and apportionment is important to understand. As seen above,

the purpose of both cost allocation and cost apportionment is the identification or allotment of items of cost to cost centres or cost units. However, the main difference between the two procedures is that while allocation deals with whole items of costs, apportionment deals with proportions of the items of cost.

Overhead Cost Control NOTES Self-Instructional 120 Material

Allocation is a direct process but apportionment may be made only indirectly and for which suitable bases are to be selected. Whether an

item of cost can be allocated or apportioned does not depend upon the nature of cost

but upon its relation with the cost centres or cost units to which it is to be charged.

Overheads should always be allocated, as far as possible. If an overhead cost cannot be allocated, it is apportioned. This involves finding some basis of apportionment that will enable the overhead cost to be equitably distributed over various production and service departments.

Production and Service Departments Departments are classified into production and service departments. A production department is one that is engaged in the actual manufacture of the product by changing the shape, form or nature of material worked upon or by assembling the parts into finished product. A service department, on the other hand, is one which is rendering a service to production departments. It contributes in an indirect manner to the manufacture of the product but it does not itself change the shape, form or nature of material that is converted into the finished product.

Principles of Apportionment Apportionment of overheads to various production and service departments is based on the following principles: 1. Service or use: This is the most common principle of apportionment of overhead costs. It is based on the theory that greater the amount of service or benefit received by a department, the larger should be the share of the cost to be borne by that department. For example, rent is apportioned to various departments according to the floor space occupied; telephone cost according to the number of extension telephones in each department, and so on. 2. Survey method: This method is used for those overhead costs that are not directly related to departments and whose remoteness necessitates an arbitrary distribution. For example, salary of a general manager of a company may be apportioned on the basis of the results of a survey which may reveal that 30% of his salary should be apportioned to sales, 10% to administration and 60% to various producing departments. Similarly, lighting expenses may be apportioned on the basis of a survey of the number of light points, size, estimated hours of use, etc. 3. Ability-to-pay method: This is based on the theory of taxation which holds that those who have the largest income should bear the highest proportion of the taxburden. In overhead cost distribution, those departments which have the largest income may be charged with the largest amount of overheads. This method is generally considered inequitable because it penalizes the efficient and profitable departments to the advantage of inefficient ones.

Overhead Cost Control NOTES Self-Instructional Material 121 Bases of Apportionment The following are some of the common bases of apportionment of overheads: Overhead Cost Bases of Apportionment 1. (i) Rent and other building expenses (ii) Lighting and heating Floor area, or (iii) Fire precaution service volume of department (iv) Air-conditioning 2. (i) Fringe benefits (ii) Labour welfare expenses (iii) Time keeping Number of workers (iv) Personnel office (v) Supervision 3. (i) Compensation to workers (ii) Holiday pay Direct wages (iii) ESI and PF contribution (iv) Fringe benefits 4. General overheads Direct labour hours, or Direct wages, or Machine hours 5. (i) Depreciation of plant and machinery (ii) Repairs and maintenance of Capital values plant and machinery (iii) Insurance of stock 6. (i) Power/steam consumption (ii) Internal transport Technical estimates (iii) Managerial salaries 7. Lighting expenses No. of light points, or Area 8. Electric power Horse power of machines, or Number of machine hours, or Value of machines 9. (i) Material handling Weight of materials, or Volume of (ii) Stores overheads materials, or Value of materials The choice of an appropriate basis is really a matter of judgement. For example, welfare expenses may be apportioned on the basis of number of employees or total wages.

Similarly lighting expenses may be apportioned on the basis of number of light points in each department

or on the basis of floor area. For allocation and apportionment of overheads, a statement called of 'Overheads Distribution Summary' is prepared as shown in Illustration 6.1.

Illustration 6.1: Mosich Co.

Ltd, has

three production departments A, B and C

and two service departments D and

E. The following figures are extracted from the records of the company: ` `

Rent and rates 5,000

General lighting 600 Indirect wages 1,500

Power 1,500 Depreciation

of machinery 10,000

Sundry expenses 10,000

Overhead Cost Control NOTES Self-Instructional 122 Material

The

following further details are available: Total

A B C D E

Floor space (Sq. ft) 20,000 4,000 5,000 6,000 4,000 1,000

Light points 120 20 30 40 20 10 Direct wages (`) 10,000 3,000 2,000 3,000 1,500 500 H.P. of machines 150 60 30 50 10
 – Value of machinery (`) 2,50,000 60,000 80,000 1,00,000 5,000 5,000
 Apportion the costs to various departments on the most equitable basis and prepare Overhead Distribution Summary.

Solution: Overheads

Distribution Summary Item Basis of Total Producing Deptts Service Deptts apportionment

A B C D E ` ` ` ` ` ` Direct wages

Actual 2,000 – – – 1,500 500

Rent and rates Floor space 5,000 1,000 1,250 1,500 1,000 250 General lighting

Light points 600 100 150 200 100 50 Indirect wages Direct wages 1,500 450 300 450 225 75 Power H.P. of machines 1,500 600 300 500 100 – Depreciation

of

Value of machinery machines 10,000 2,400 3,200 4,000 200 200 Sundry expenses Direct wages 10,000 3,000 2,000 3,000 1,500 500 Total 30,600 7,550 7,200 9,650 4,625 1,575 Note: It should be noted that direct wages have been charged only for service departments because for service departments, all costs are indirect.

Once the overheads have been allocated and apportioned to production and service departments and totalled, the next step is to re-apportion the service department costs to production departments. This is necessary because our ultimate objective is to charge overheads to cost units, and no cost units are produced in service departments.

Therefore, the costs of service departments must be charged to production departments which directly come in contact with cost units. This is called secondary distribution.

The method of re-apportionment of service department costs is similar to apportionment of overheads discussed earlier.

Thus,

the

costs of service departments are apportioned on the basis of service rendered, i.e., the benefits received by the beneficiary departments.

Overhead Cost Control NOTES Self-Instructional Material 123 Apportionment

to Production Departments Only In this case, cost of each service department is apportioned only to production departments without apportioning it to other service

departments. Apportionment to Production as well as

Service Departments Quite often,

a service department renders services not only to production department but also to other service departments. For example,

maintenance department looks after not only

the plant and machinery of production department but also the equipment of other service departments like power house, material handling, etc.

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Similarly, power house supplies electricity not only to production departments but also to service departments like canteen, maintenance departments, etc. This type of inter-service department apportionment may be either on reciprocal basis or non-reciprocal basis. Apportionment on non-reciprocal basis (Stepladder Method): This method is used when a service department renders services to other service departments but does not receive services of the

other service departments, i.e., when service departments are not inter-dependent.

In this method, the service

departments are arranged in descending order

of their serviceability. The cost of the most serviceable department,

i.e., the department which serves the largest number of departments is first apportioned to other service departments.

The service department which serves the next largest number of departments is taken up next and its cost (including the prorated cost of the first service department) is apportioned to other service and production

departments excepting the first service department. In the same way, while apportioning the cost of the

third service department in this order, the first two service departments are ignored. This process is continued till

the cost of the last service department is apportioned. It should be noted that the cost of the last service department is apportioned only to production departments. Apportionment on reciprocal basis: This method is used when service departments are mutually dependent.

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This means a service department not only provides its services to other service departments but also receives services of other service departments. For example, boiler house

and pump room are the two service departments. Boiler house has to depend upon pump room for supply of water and pump room has to depend upon the boiler house for supply of steam power for driving the pump. Thus, both boiler house and pump room depend upon each other for their services. The following methods may be used for apportionment of overhead costs on a

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reciprocal basis: 1. Simultaneous Equations Method 2. Repeated Distribution Method 3. Trial and Error Method

Overhead Cost Control NOTES Self-Instructional 124 Material 1.

Simultaneous Equations Method: In this method, the following algebraic equations help in finding out cost of service departments. $X = a + bY$ $Y = a + bX$

Repeated Distribution Method: In

this method the following steps are taken to apportion the service departments costs: 1. The costs of the first service department are apportioned in the normal way according to the given percentages. This will close the account of the first servicedepartment. 2. Then apply the given percentages for the apportionment of second service department costs which include their own cost plus amount apportioned from the first service department. This closes the account of the second service department but reopens the account of the first service department. 3. The same procedure should be followed in the case of all other service departments. This completes the first cycle of apportionment. 4. The procedure should be repeated again starting with the first service department whose total now consists only of amounts apportioned from other service departments. In this way, service department costs keep on reducing with each cycle of distribution because each time, a substantial amount is charged to the production departments. 5. This process is continued until the amounts involved become insignificant.

It should be noted that unlike Simultaneous Equations Method, this method produces approximate results. But the advantage of this method is that it can be conveniently applied where the number of service departments is more than two. 3.

Trial and Error Method: In

this method

the cost of first service department is apportioned to otherservice departments only

in the given percentage. The cost of the second service department then is apportioned to the first and other service departments. In this way, when the cost of all service departments has been apportioned, the process is repeated till the service department costs are reduced to negligible amounts. In this way, the total cost of each service department is found out by trial and error.

It will be seen that this is a modification of repeated distribution method where production departments are initially ignored for the purpose of redistribution. Like Repeated Distribution Method, this method may also give approximate results. It is important to note that all the three methods produce the same result.

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Illustration 6.2: A company has three production departments and two service departments. Distribution summary of overheads is as follows:

Overhead Cost Control NOTES Self-Instructional Material 125

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Production Departments Service Departments A `3,000 1 `234 B `2,000 2 `300 C `1,000 The expenses of service departments are charged on a percentage basis which

is

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as follows: A B C 1 2 1. 20% 40% 30% – 10% 2. 40% 20% 20% 20% – Find out the total overheads of production departments using the following methods: (a) Simultaneous Equations Method (b) Repeated Distribution Method Solution: (a) Simultaneous Equations Method Let x denote total overheads of service department 1 y denote total overheads of service department 2 Therefore, $x = 234 + 0.2y$... (i) $y = 300 + 0.1x$... (ii) To solve the equations,

re-arrange

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these and multiply by 10 to eliminate decimals. $10x - 2y = 2,340$... (i) $-x + 10y = 3,000$... (ii) Multiplying second equation by 10 and adding $10x - 2y = 2,340 - 10x + 100y = 30,000$ $98y = 32,340$ $y = 32,340 \div 98$ $y = 330$; and $x = 300$ Secondary Distribution Summary Total Production Departments A B C ` ` ` ` Total as per primary summary 6,000 3,000 2,000 1,000 Service Deptt 1 (90% of 300) 270 60 120 90 Service Deptt 2 (80% of 330) 264 132 66 66 Total 6,534 3,192 2,186 1,156

Overhead Cost Control NOTES Self-Instructional 126 Material (

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b) Repeated Distribution Method Items Production Deptts Service Deptts A B C X Y ` ` ` ` ` Total as per primary summary 3,000 2,000 1,000 234 300 Service

Deptt 1 47 94 70 (-) 234 23 Deptt 2 129 65 65 64 (-) 323 Deptt 1 14 25 19 (-) 64 6 Deptt 2 2 2 2 – – Total 3,192 2,186 1,156 – – Check Your Progress 3. State the difference between allocation and apportionment. 4. What is trial and error method? 6.4 ABSORPTION OF OVERHEADS

AND ITS

METHODS Once departmentalization of overheads has been completed,

the total cost of each production department comprises the following: (i) Costs allocated and apportioned to production departments. (

ii) Costs of service departments re-apportioned to production departments.

The total overhead cost pertaining to a production department or cost centre is then charged to or absorbed in the cost of the products or cost units passing through that centre. This is known as absorption. The absorption of overheads is the last step in the distribution plan of overheads. It is defined as charging of overheads to cost units.

In other words, overhead absorption is the apportionment of overheads of the cost centres over cost units.

Absorption of overheads is also known as levy, recovery or application of overheads. There are two steps in the absorption of overheads: 1. Computation of overheads absorption rate; and 2. Application of these rates to cost units. 1. Computation of Overheads Absorption Rate:

Absorption rates are computed for the purpose of absorption of overheads in costs of the cost

units. 1. Computation of Overheads Absorption Rate:

units. There are mainly six methods for determining absorption rates which have been described later in this unit. In all these methods, the overhead rate is computed by dividing the total amount of overheads of department or cost centre by the number of units in the base, such as number of cost units, machine hours, labour hours, direct labour cost, price cost, etc. This is shown

as follows:

Overhead Cost Control NOTES Self-Instructional Material 127

Overheads absorption rate =

Total overheads of cost centre / Total units in base

It should be noted that only one rate is computed for any single group of overheads. 2. Application of rates

to cost units: In order to arrive at the overhead cost of each cost unit, the

overhead rate is multiplied by

the number of units of base in the cost unit. Thus: Overhead absorbed = No. of units of base in the cost unit × Overhead rate

For example,

machine hour rate is ₹25 and a cost unit has used 12 hours of the machine, overheads absorbed will be = 12 hours ×

₹25 = ₹300. Methods of Absorption of Production Overheads Various methods of absorption discussed below are used to determine the overheads absorption rate for production overheads. 1. Direct Materials Cost Percentage Rate: Under this method,

the amount of overheads to be absorbed by a cost unit is determined by the

cost of direct materials consumed in producing it. This rate is computed

by dividing the total overheads by the total cost of direct materials consumed in the

department. Thus, Overhead rate = Production overheads / Direct materials × 100

Example:

Production overheads ₹40,000 Direct materials ₹200,000 Overhead rate = $\frac{40,000}{200,000} \times 100 = 20\%$ Thus, if the direct material cost of a job or cost unit is ₹1,200, the overheads to be absorbed by it will be ₹240, i.e., 20% of ₹1,200. 2.

Direct Labour Cost Percentage Rate:

The overhead rate under this method is computed by dividing the production overheads by the direct labour cost.

Overhead rate = $\frac{\text{Production overheads}}{\text{Direct labour cost}} \times 100$

Example:

Production overheads = ₹40,000 Direct labour cost = ₹1,00,000 Overhead rate = $\frac{40,000}{1,00,000} \times 100 = 40\%$

Thus a job for which direct wages are ₹200 will absorb production overheads of ₹80, i.e., 40% of ₹200.

Overhead Cost Control NOTES Self-Instructional 128 Material 3.

Prime Cost Percentage Rate:

This method is based on the premise that both materials and labour give rise to

factory overheads and thus the total of the two, i.e., prime cost should be taken as the base for absorption of factory

overheads. In a way, this is a combination of the material cost and labour cost methods. Overhead rate in

this method is calculated by dividing the production overheads by

prime cost. Overhead rate = $\frac{\text{Production overheads}}{\text{Prime cost}} \times 100$

Example:

Production overheads = ₹40,000 Prime cost = ₹2,50,000 Overhead rate = $\frac{40,000}{2,50,000} \times 100 = 16\%$

Thus, if prime cost of a job is ₹500, production overheads to be absorbed by that job should be ₹80, i.e., 16% of ₹500.

Although overheads are related more to labour cost than material costs, this method gives equal importance to both material and labour. When the cost of materials is predominating item of prime cost, the time factor will be ignored. This is shown below:

Job I Job II Direct materials 1,000 100 Direct labour @ ₹5 per hour 100 1,000 Prime cost 1,100 1,100

Production overhead (40% of prime cost) 440 440 Works cost 1,540 1,540

It is seen that although Job II takes much longer time than Job I, the charge to both the jobs for production overheads is the same. The above illustration also

shows that this method is likely to degenerate into either material cost method or labour cost method. This is because in

Job I direct material is the main constituent of prime cost and in Job II labour cost is the main constituent but the charge

to both the jobs is the same. 4. Direct Labour Hour Rate: This is a rate per hour and not a percentage rate. It is obtained

by dividing the total production overheads by the total number of direct labour hours for the period.

Overhead rate = $\frac{\text{Production overheads}}{\text{Direct labour hours}}$

Example:

Production overheads = ₹40,000 Direct labour hours = 1,00,000 Overhead rate = $\frac{40,000}{1,00,000} = ₹0.40$ per hour

Cost Control NOTES Self-Instructional Material 129

Overhead rate =

$\frac{\text{Production overheads}}{\text{Direct labour hours}}$

Example:

Production overheads = ₹40,000 Direct labour hours = 1,00,000 Overhead rate = $\frac{40,000}{1,00,000} = ₹0.40$ per hour

Example: Production overheads = ₹ 40,000 Direct labour hours = 50,000 hours Overhead rate = $\frac{40,000}{50,000}$ hours = 80 paise per hour

Thus, if a job takes 20 labour hours for production, ₹ 16 (i.e., 20 hours @ 80 paise) will be charged to that job for production overhead.

Illustration 6.3: Aggarwal and

Co.

has three production departments—A, B and C and one service department S. The following particulars are available

for one month of 25 working days of 8 hours each. All departments work all days with full attendance. Total Service

	deptt S	deptt A	deptt B	deptt C
Power and lighting	1,100	240	200	360
Supervisor's salary	2,000	20%	30%	20%
Rent	500	Welfare	600	Others
		1,200	200	200
		400	400	Number of workers
		10	30	40
		20	Floor area in sq. ft	500
		600	800	600
		Service rendered by service department to production departments	50%	30%
		20%	Calculate the 'Labour Hour Rate' of each of the departments A, B and C. Solution:	

Overhead Cost Control NOTES Self-Instructional 130 Material 5.

Machine Hour Rate: Machine hour rate is the overhead cost of running a machine for one hour. This rate is obtained by dividing the amount of factory overheads apportioned to a machine by the number of machine hours for the period under consideration.

Example: Production overheads of Machine I = ₹ 25,000 No. of machine hours = 2,000 Machine hour rate = $\frac{25,000}{2,000}$ = ₹ 12.50 If Machine I has been used for a job for 30 hours, overheads to be absorbed by that job will amount to ₹ 375, i.e., 30 hrs × ₹ 12.50. Computation of Machine Hour Rate: The following steps are taken for the computation of machine hour rate: (i) The factory overheads are first apportioned to production departments as discussed earlier under allocation and apportionment. (ii) Overheads of the department are further apportioned to different machines or groups of machines. For this purpose each machine or a group of machines is treated as a cost centre or a small department. Bases of apportionment of different expenses are given here. (iii) Specific overheads, like power, depreciation, etc., should be directly allocated to the machine. (iv) The overheads relating to the machine should be divided between (a) Fixed or standard charges, and (b) Variable charges. Fixed charges are those which remain constant irrespective of the use of the machine, e.g., rent, supervisor's salary, etc. Variable charges vary with the use of machines, e.g., power, depreciation, etc. (v) The working hours of a machine are estimated for the period. (vi) Overheads pertaining to the machine are totalled and divided by the number of effective machine hours. The resultant figure will be machine hour rate. The time required for setting the machine (unless it is treated as producing time) should be deducted from the total working hours to arrive at effective hours. Treatment of depreciation: Depreciation is a semi-variable item. In the computation of machine hour rate, some accountants treat it as a fixed cost while others treat it as a variable cost. In fact, whether it is to be treated as fixed or variable cost, depends upon the method of computing depreciation. In this unit, it has been mostly treated as a variable item.

Overhead Cost Control NOTES Self-Instructional Material 131

Bases of Apportionment of Different Overheads to Machines Items of overheads Basis of apportionment

1. Rent and rates Ratio of floor area occupied by each machine
2. Insurance Insured value of each machine
3. Supervision Estimated time devoted by the supervisor to each machine
4. Lighting No. of light points used for each machine, or floor area occupied by each machine
5. Depreciation Capital values/machine hours or multiple of both
6. Repairs and maintenance Capital values/machine hours
7. Lubricating oil and other consumable stores Capital values/machine hours

Comprehensive (or composite)

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machine hour rate: When the direct wages of machine operators are included in machine hour rate, it is known as comprehensive machine

hourrate. Thus in a

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comprehensive machine hour rate, overheads and direct wages are absorbed by a single rate.

Illustration 6.4:

From the following information compute the machine hour rate in respect of machine No. 10 for the month of January: Cost of machine ₹ 32,000 Estimated scrap value ₹ 2,000 Effective working life 10,000 hours Repairs and maintenance over the life period of machine ₹ 2,500 Standing charges allocated to this machine for January, ₹ 400 Power consumed by the machine @ ₹ 0.30 per unit, ₹ 600 The machine consumes 10 units of power per hour.

Solution: Computation of Machine Hour Rate ₹ per hr Standing charges (400 ÷ 200*) 2.00 Variable Charges: 1. Repairs and Maintenance (₹ 2,500 ÷ 10,000 hrs) 0.25 2. Power (10 units @ 30 Paise) 3.00 3. Depreciation 32,000 2,000 10,000 hrs ? ? ? ? ? ? ? 3.00

Machine Hour Rate 8.25 *Working Notes: No. of machine hours during the month of January is computed below: No. of power units consumed in January = ₹ 600 ÷ ₹ 0.30 = 2,000 units No. of machine hours = 2,000 units ÷ 10 units = 200 hours.

Overhead Cost Control NOTES Self-Instructional 132 Material 6. Rate per Unit of Output: It is the simplest of all the methods. This rate is determined by dividing the total overheads of a department by the number of units produced. Example: Production overheads = ₹ 22,000 No. of units produced = 1,000 Overheads rate = Amount of overheads No. of units = 22,000 1,000 = ₹ 22 per unit Thus, each unit produced will absorb ₹ 22 for production overheads. Though this method has the advantage of simplicity, but unfortunately it can be advantageously used only when all the cost units produced are identical. Stated conversely, this method cannot be applied where a number of products of different sizes, grades, qualities, etc., are produced according to customer's specifications and which consume different amounts of time in production.

Illustration 6.5: Following particulars related to

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the production department of a factory for the month of June. Material used ₹ 80,000 Direct wages ₹ 72,000 Direct labour hours worked 20,000 Hours of machine operation 25,000

Overhead charges allocated to the

department ₹ 90,000 Cost data of a particular work order carried out in the above department during June are given below: Material used ₹ 8,000 Direct wages ₹ 6,250 Labour hours booked 3,300 Machine hour booked 2,400 What would be the factory cost of the work order under the following methods of charging overheads. (i) Direct labour cost rate (ii) Machine hour rate (iii) Direct labour hour rate Solution: Computation of Factory Overheads Rates: (i) Direct Labour Cost Rate:

Overheads Direct wages × 100 = 90,000 72,000 × 100 = 125%

Overhead Cost Control NOTES Self-Instructional Material 133 (ii) Machine Hour Rate:

Overheads No. of machine hours = 90,000 25,000 hrs = ₹ 3.60 per hour (iii) Direct Labour Hour Rate: Overheads No. of labour hours = 90,000 20,000 hrs = ₹ 4.50

per hour Statement of Factory Cost Direct labour cost Machine hour Direct labour rate rate hour rate ₹ ₹ Direct material 8,000 8,000 8,000 Direct wages 6,250 6,250 6,250 Prime Cost 14,250 14,250 14,250 Factory overheads: (i) 125% of ₹ 6,250 7,812.50 — — (ii) @ ₹ 3.60 for 2,400 hrs — 8,640 — (iii) @ ₹ 4.50 for 3,300 hrs — — 14,850 Factory Cost 22,062.50 22,890 29,100 6.4.1

Types of Overhead Rates Overhead rates may be: (i) actual or predetermined; and (ii) blanket or multiple. These are described below. Actual and Predetermined Rates Overheads

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absorption rate may be based on actual figures or estimated figures. Actual

Rate: It is calculated by dividing the actual overheads by actual base. Thus: Actual overhead rate = Actual amount of

overheads Actual base On account of certain limitations of actual rate, it is not always desirable to use it for the absorption of overheads. These limitations are: 1.

Actual rate cannot be computed until the end of the accounting period.

This results in delay in computing cost. 2. When costs are used to calculate the selling prices for quotations and tenders, there is bound to be a considerable delay before the sales department can invoice customers due to delay in information from costing department. 3. Actual rate may vary from period to period due to fluctuations in the amount of overheads, the volume of output and efficiency of operations. This makes comparisons difficult. 4. These rates do not provide any basis for cost control.

Overhead Cost Control NOTES Self-Instructional 134 Material

Predetermined Rate: This rate

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is determined in advance of the period in which it is to be used.

It is computed by dividing the estimated or budgeted amount of overheads by the budgeted base. Thus: Predetermined rate =
$$\frac{\text{Budgeted amount of overheads}}{\text{Budgeted base}}$$
 As compared to actual rate, a predetermined rate is of greater practical utility. This is because a predetermined

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rate enables prompt preparation of tenders and quotations and fixation of selling prices.

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Cost control is also facilitated by comparing the actual overheads with the predetermined overheads recovered. The

use of predetermined rates thus, helps in deriving some of the benefits of standard costing and budgetary control. Blanket and Multiple Rates

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A blanket overhead rate is a single overhead rate for the entire factory. It is computed as follows.

Blanket rate =
$$\frac{\text{Total overheads for the factory}}{\text{Total number of units of base for the factory}}$$
 Blanket overhead rate should not be used except when output is uniform. Otherwise it will result in overcosting or undercosting of certain cost units. Moreover, when a blanket

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rate is used, performance of individual departments or cost centres cannot be properly assessed and exercise of control becomes difficult.

Blanket rate is also known as Plant-wide or Plant-wise rate. Multiple rates means a number of separate rates for each department, cost centre, etc. For instance, separate rates may be calculated for each of the following: (a) Production department (b) Service department (c) Cost centre (d) Product (e) Fixed overheads and variable overheads The following formula is used to calculate the multiple rates: Overhead rate =
$$\frac{\text{Overheads of department or cost centre}}{\text{Corresponding base}}$$
 Blanket rates have a very limited application and can be usefully employed in (i) small firms, or (ii) when one single product is produced, or (iii) when a firm is producing more than one product and all of these products pass through all the departments and the incidence of overheads is uniform. Except in these situations, Overhead Cost Control NOTES Self-Instructional Material 135

use of blanket overhead rate may result in distortion of cost. The main disadvantages of blanket rates are as follows: 1. The use of blanket rate gives misleading and erroneous results, particularly where a firm is producing several products and all of these products pass through a number of production departments or cost centres. 2. When a blanket

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rate is used, performance of individual departments or cost centres cannot be properly assessed and exercise of control becomes difficult. 3.

The use of blanket rate may produce an erroneous work-in-progress valuation because products included in work-in-progress might not have passed through all the departments and if a blanket rate is charged for its valuation, the work-in-progress will be over-valued to the extent of facilities not used in it. Multiple rates are of more practical utility and should always be preferred over blanket rate for the sake of accuracy and control.

Requisites of a Good Method of Absorption A satisfactory method of absorption should have the following characteristics: 1. It should be simple

and easy to operate. 2. It should give accurate results and provide an equitable basis for overheads absorption. 3. Time factor should be given due consideration. 4. The method should distinguish between work done by skilled and unskilled workers. 5. It should also make a distinction between work done by hand labour and machines. 6. It should be economical in application and should not require maintenance of unnecessary clerical records. 7. Multiple rates should be preferred to blanket rates.

Capacity Utilization and Overheads Capacity of a factory refers to its ability to produce with the resources and facilities available at its disposal.

If, for instance, with all the resources of men, materials and machines available at its command, a company can produce 500 units of a product per day, the capacity of the factory is said to be 500 units of production per day.

Plant capacity may be expressed in terms of any of the following: (

a) Units of products: For example tonnes of steel, meters of cable, number of cars or scooters, number of passenger kilometres, etc.

Overhead Cost Control NOTES Self-Instructional 136 Material (b) Production hours or machine hours: For example, if in a factory there are 40 machines and each of these machines can be operated for 8 hours per day, the plant capacity in terms of production hours will be $40 \times 8 = 320$ production hours per day. Capacity Levels The various types of capacity levels are: 1. Maximum

Capacity: This is the maximum production capability of a plant

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which can be achieved only under perfect conditions, i.e., when there is no loss of operating time.

As some loss of time is bound to occur, this capacity can never be achieved in practice and it is for this reason that it is known as a theoretical capacity. 2. Practical Capacity: Also known as operating capacity, this is the maximum capacity less output or time lost due to unavoidable factors like plant repairs and maintenance, setting up time, holidays, etc., and other normal losses. 3. Capacity Based on Sales Expectancy: This is a capacity which is based on expected sales and is determined after a careful study of the market conditions. A concern may not be able to sell the entire output which it is capable of producing. This capacity level is usually less than practical capacity because of lack of orders from the customers. 4.

Actual Capacity: This is the capacity actually achieved during a particular period. This

is known only after the period is over and may be below or above the capacity based on sales expectancy. 5. Normal

Capacity: This is the long-term average of the capacity based on sales expectancy. In other words, the concept of normal capacity is based on the average utilization of plant capacity over a long period. An overhead rate based on normal capacity does not fluctuate much because the long-term average levels out highs and lows that occur in a business. Normal capacity is thus also known as average capacity.

Capacity Levels and Overhead Rates The capacity level that is selected for calculating the fixed overhead rate may significantly affect the overhead absorption rate and

thus affect the product cost and selling price. It was stated earlier that overhead rates can be actual or predetermined. Determination of actual rates is based on the actual level of capacity and thus presents no difficulty. However, when predetermined rates are to be used, capacity level selected will affect the overhead rate. For example, annual fixed overheads are ₹ 10 lakh and annual capacity is 10,000 labour hours. The overhead rate for charging to the cost of products is ₹ 100 per hour (i.e., ₹ 10 lakh ÷ 10,000 hours). Suppose there is a decline in the demand and actual work done is only 8,000

Overhead Cost Control NOTES Self-Instructional Material 137 labour hours, the revised overhead rate will be ₹ 125 per hour (i.e., ₹ 10 lakh ÷ 8,000 hrs). If the demand falls further to work only for 5,000 hours, the overhead rate will increase further to ₹ 200 per hour (i.e., ₹ 10 lakh ÷ 5,000 hours). It is thus recommended that companies use normal capacity level to calculate overhead rate so that cost of products are not distorted by short-term changes in demand.

Overhead rates based on normal capacity provide a better approximation of long-term average costs. Illustration 6.6: A company has a maximum capacity of working 5,000 direct labour hours, at 100 per cent capacity. Practical capacity is 90 per cent and normal capacity 80 per cent. At 100 per cent capacity, overheads are budgeted as follows: Fixed overheads ₹ 20,000 Variable overheads ₹ 10,000 Show the effect of various capacity levels on the overhead absorption rates. Solution: Effect of Various Capacity Levels on Predetermined Overheads Absorption Rates

	Maximum capacity	Practical capacity	Normal capacity	Percentage of capacity utilization
Direct labour hours	5,000	4,500	4,000	100% 90% 80%
Budgeted factory overheads:				
Fixed	20,000	20,000	20,000	
Variable	10,000	9,000	8,000	
Total	30,000	29,000	28,000	
Fixed overhead rate per direct labour hour	4.00	4.44	5.00	(Fixed overheads ÷ Labour hrs)
Variable overhead rate per direct labour hour	2.00	2.00	2.00	(Variable overheads ÷ Labour hours)
Total overhead rate per direct labour hour	6.00	6.44	7.00	(Total overheads ÷ Labour hours)

In the above illustration, it should be noted that overhead rates are different at different capacity levels due to the influence of fixed overheads. When actual capacity utilization is lower, it results in under-absorption of overheads and vice versa; when actual capacity utilization is higher, there is over-absorption

of overheads.

Idle Capacity This is

the difference between practical capacity and capacity based on sales expectancy or actual capacity.

In other words, idle capacity is the production capacity lost due to reasons like lack of orders from customers, absenteeism, shortage of materials, etc. It is a temporary phenomenon and can be wiped out when difficulties causing idle capacity are overcome.

Overhead Cost Control NOTES Self-Instructional 138 Material Suppose maximum capacity of a plant = 500 units per day of 8 hrs each. Normal loss of time is 10 per cent. Practical capacity = Maximum capacity – Normal loss of time = 100% – 10% = 90% = 500 units – 50 units = 450 units per day Actual capacity is only 360 units per day or 90% × 360/450 = 72% Idle capacity = Practical capacity – Actual capacity = 90% – 72% = 18% = 450 units – 360 units = 90 units per day Idle Capacity and Idle Time Idle time is the loss of labour time which arises due to waiting for materials, tools, job instructions or due to machine breakdown or power failure or due to changing from one job to another. This may be avoidable or unavoidable. Although no work is done during the period of idle time, wages are paid to the workers for this lost time. Idle capacity, on the other hand, represents unused production potential and is the difference between practical capacity and actual capacity. Idle capacity is a wide term and

the cost of idle time forms a part of the cost of idle capacity. Cost of

Idle Capacity

Idle capacity costs are represented mostly by fixed charges of owning and maintaining plant and machinery and of employee services which are not used at their maximum potential.

This is so because fixed costs continue to be incurred even if the plant is kept idle. The cost of idle capacity is clearly brought out if overheads absorption rate is calculated on practical capacity—as the base. It comes out in the form of under-absorption of overheads. The cost of idle capacity and the reasons due to which capacity remains unutilized can be found out by computing overheads capacity variance and by preparing idle time reports, plant utilization reports and idle machine time reports. These reports are prepared periodically which clearly bring out the period for which plant remained unutilized and the cost of such capacity that is not utilized. Illustration 6.7: Flakt India Ltd manufactures component part XE at the rate of 2 units per hour. The factory normally operates 6 days a week on a single eight-hour shift. During the year, it is closed for 20 working days for holidays. Normal loss of machine time for cleaning, oiling, etc., is 160 hours per year. Fixed overhead

Overhead Cost Control NOTES Self-Instructional Material 139 cost per annum is ₹ 37,128. Normal sales for the component averages 2,500 units per year. The expected sales volume for the year 2010 was 2,400 units. Compute the idle capacity cost when overhead rates are based on practical capacity. Solution: Maximum capacity = Total days in the year × No. of hours worked per day = 365 × 8 = 2,920 hours Practical capacity = Maximum capacity – Normal loss
Maximum capacity 2,920 hrs Less: Sundays (52 days × 8 hrs) 416 Holidays (20 days × 8 hrs) 160 Loss due to cleaning, oiling, etc. 160 736 hrs Practical capacity 2,184 hrs Normal capacity = Normal sales ÷ Units per hour = 2,500 units ÷ 2 units per hour = 1,250 hours Capacity based on sales expectancy = 2,400 units ÷ 2 units per hour = 1,200 hours Absorption rate per hour, based on practical capacity (for fixed cost only) =
Fixed overhead cost (₹) 37,128 Practical capacity (hours) 2,184 hours ? = ₹ 17 per hour Idle capacity = Practical capacity – Capacity based on sales expectancy = 2,184 – 1,200 = 984 hrs Cost of idle capacity = Idle capacity × Overhead rate = 984 hrs × ₹ 17 = ₹ 16,728 Note: Idle capacity has been taken

as the difference between practical capacity and capacity based on sales expectancy.

It may also be taken as the difference between practical capacity and actual capacity, if information in this respect is available.

Check Your Progress 5. What are the two steps involved in the absorption of overheads? 6. What is machine hour rate?
Overhead Cost Control

NOTES Self-Instructional 140 Material 6.5 ADMINISTRATION, SELLING AND DISTRIBUTION OVERHEADS Uptill now you have learnt about the treatment of production and service overheads, in this section, you will learn about administration, selling and distribution overheads. Administration Overheads (Office

Or General

Overheads) Office and administration overheads pertain to general management and administration of business. They may be defined as the indirect expenditures

incurred in

formulating the

policy, directing the organization and controlling the operations of

an

undertaking.

These

overheads are of a general character and are incurred for the business as a whole. They have little or no direct connection with production or sales activities.

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As production and sales cannot function without some sort of administrative control, these overheads serve the purpose of such a control.

Expenses of activities of board of directors, accounting, secretarial, audit, legal, financial, etc., are included in administrative overheads. These overheads are generally constant in nature and are not affected by any fluctuations in the volume of production or sales. Accounting Treatment Classification and collection of office and administrative overheads is done in the same way as that of production overheads. Separate standing order numbers are allotted to each item of such an overhead cost, such as legal charges, travelling expenses, office rent, audit fees, etc. These overhead costs are then allocated and apportioned to various administrative departments, like general office, law department, accounts department and secretarial department.

Absorption of Administration

Overheads Office and administrative overheads generally constitute a small portion of the total cost as compared to production overheads.

For the purpose of absorption of these overheads, a single (blanket) overhead rate is computed by any one of the following methods: 1. Percentage of works cost: Administration overhead cost is generally absorbed as a percentage of works cost. Such a rate is computed by the following formula: Overhead rate =

Admn. overheads works cost × 100

For example, if administration overheads are ₹ 12,000 and works cost is ₹ 2,40,000, the overhead rate is computed as follows: Admn. overhead rate = $\frac{12,000}{2,40,000} = 5\%$

Overhead Cost Control

NOTES Self-Instructional Material 141 2.

Percentage of sales: Sometimes office and administration overheads are absorbed as a percentage of sales.

Its formula is: Overhead rate =

Administration overheads

Sales × 100

As a percentage of conversion cost: Conversion cost is the cost of converting raw material into finished goods. It includes cost of direct labour and factory overheads.

This method is rarely used. Overhead rate

is calculated by the following formula: Overhead rate =

Administration overheads

Total conversion cost × 100

Selling and Distribution Overheads Selling and distribution costs are usually incurred after the production of products or services is completed, and therefore, such costs are sometimes known as ‘

after- production

costs.’

Selling cost is

the cost of seeking to create and stimulate demand (sometimes termed marketing) and of securing orders.

These costs are thus incurred for increasing sales to the existing and potential customers. Examples are advertisement, samples and free gifts, show-room expenses, etc.

Distribution cost is the cost of the sequence of operations

which begins with making the packed product available for dispatch and ends with making the reconditioned returned empty

packages, if any, available for re-use.

Thus distribution

costs are incurred in placing the articles in the possession of the customers. Examples are carriage outwards, insurance of goods-in-transit, maintenance of delivery vans and warehousing. For costing purposes, selling costs and distribution costs are generally considered together, although in some cases these may be dealt with separately. Difference between selling overheads and distribution overheads: Selling overheads and distribution overheads differ in their nature and purpose.

Selling overheads are incurred for promoting sales and securing orders while distribution overheads are mainly incurred in moving the goods from the company’s godown to customers’ place. The object of selling overheads is to solicit orders and to make efforts to find and retain customers. The object of distribution overheads is the safe delivery of the goods to the customers. **Special Features of Selling and Distribution**

Overheads Selling and distribution overhead costs have certain peculiar features which have a bearing on the accounting and control of these costs. These features are: (a) Unlike production costs, most of the selling and distribution costs cannot be identified with the units of products.

Overhead Cost Control NOTES Self-Instructional 142 Material (b) Selling costs are incurred as a matter of policy of management. (c) Selling costs are not always related to the volume of sales. (d) The characteristics and attitude of the customers also affect selling costs. (e) The same product may be sold in near or distant market. This will affect cost of packing and transportation. (f) Selling costs vary widely depending upon the degree of competition.

Accounting Treatment The accounting procedure of selling and distribution cost comprises: 1. Classification, collection and analysis of these expenses 2. Apportionment and allocation to cost centres 3. Absorption by products or product groups These three stages are discussed below: 1. Classification, collection and analysis: This is the first step and is similar to classification and collection of production overheads. Selling and distribution overheads may be classified on the basis of products, sales territories, channels of distribution, salesmen, etc. When classification of expenses is complete, expenses are collected under standing order numbers provided for this purpose. 2. Apportionment and allocation to cost centres: In this step, selling and distribution overheads are allocated or apportioned to various products, sales territories or other cost centres. Some of the common bases used for distribution of selling and distribution overheads are given below.

Expenses Basis for distribution 1. Remuneration of salesmen Direct allocation 2. Advertising Direct allocation, or value of sales or space used 3. Catalogues Direct allocation or space used 4. Showroom expenses Direct allocation or space used 5. Packing Direct allocation 6. Collection of overdue accounts No. of orders or sales value 7. Insurance Value of stocks 8. Transport—outside carrier Direct allocation 9. Own transport Direct allocation or weight of product carried 10.

Warehousing Cubic ft of product stores × time (days) 3.

Absorption

of selling and distribution overheads: Absorption of selling and distribution overheads means charging of these overheads to various products, jobs or orders.

Overhead Cost Control NOTES Self-Instructional Material 143

Methods of Absorption Various methods for absorption of selling and distribution overheads are as follows: 1.

A rate per unit of sales: This method is employed when the company is selling one uniform type of product. The total selling and distribution overheads to be absorbed are divided by the number of units sold to arrive at a rate per unit. For example, a company is manufacturing only one type of TV picture tube.

During the month of May, its selling and distribution overheads amounted to ₹75,000 and

during this period, the number of picture tubes sold is 1,000. The rate per unit

for the absorption of selling and distribution overheads will be $\frac{₹75,000}{1,000} = ₹75$. 2. A percentage of

selling price: This method is recommended when the concern is selling more than one type of product. A percentage of selling and distribution overheads to selling price is ascertained from an analysis of past records. Overhead rate is calculated by the following formula:

Overhead rate = $\frac{\text{Selling and distribution overheads}}{\text{Sales}} \times 100$

Example: Selling and distribution overheads ₹5,000 Total sales ₹1,00,000 Overhead rate = $\frac{5,000}{1,00,000} \times 100 = 5\%$ of selling price 3.

A percentage of works cost: In this method, a percentage of selling overheads to works cost is ascertained. This percentage rate is applied for the absorption of selling and distribution overheads. Overhead rate is calculated as follows:

Overhead rate = $\frac{\text{Selling and distribution overheads}}{\text{Total works cost}}$

Example: Selling and distribution overheads ₹5,000 Works cost ₹40,000 Overhead rate = $\frac{5,000}{40,000} \times 100 = 12.50\%$.

6.6 UNDER-ABSORPTION AND OVER- ABSORPTION OF OVERHEADS Overheads

may be absorbed either

on the basis of actual rates or predetermined rates. When actual rates are used, the overheads absorbed

should be exactly equal to the overheads incurred. In such a case there is no problem of under- or

Overhead Cost Control NOTES Self-Instructional 144 Material

over-absorption of overheads.

But when a predetermined rate is employed, overheads absorbed may not be equal to the amount of actual overheads incurred.

Thus, whenever the

overheads absorbed are not equal to the amount of actual overheads, it is a case of either under-absorption or

over-absorption of overheads. Under-absorption:

When the amount of overheads absorbed is less than the amount of overheads actually incurred,

it is called under-absorption or under- recovery. This has the effect of under-stating the cost because the overheads incurred are not fully recovered in the cost of jobs, processes, etc.

Over-absorption: When the amount of overheads absorbed is more than the amount of actual overheads

incurred,

it is known as over-absorption or

over- recovery. It has the effect of

over-stating the cost of

jobs, processes, etc. Example:

Predetermined overhead rate = ₹5 per machine hour Actual machine hours = 1,500 Actual overheads = ₹9,000

Overheads absorbed = $1,500 \text{ hrs} \times ₹5 = ₹7,500$ Under-absorption = $₹9,000 - ₹7,500 = ₹1,500$ In this example, if the

actual machine hours worked were 1,900, then: Overheads absorbed = $1,900 \text{ hrs} \times ₹5 = ₹9,500$ Overhead over-absorbed = $₹9,500 - ₹9,000 = ₹500$

Causes of Under or Over-absorption Under

or over-absorption of overheads may

arise due to one or more of the

following reasons: 1. Faulty estimation of overhead costs 2.

Faulty estimation of the

quantity

of output 3.

Seasonal fluctuation in the amount of overheads in certain industries 4.

Unforeseen

changes in the production capacity 5. Unexpected changes in the method of production affecting changes in the amount of overheads

Whatever be the reason, under- or over-absorption is caused mainly due to wrong estimation either of the overhead costs or of the

base such as machine hours, production quantity, etc. Accounting Treatment of Under and Over-absorption Under or over-absorbed amounts of overheads are disposed of in accordance with any of the following methods, depending upon the circumstances: 1.

Use of supplementary rates: Where the amount of under or over-absorbed overheads is significant, a supplementary overhead absorption

rate is calculated to adjust this amount in the cost. However, adjustment is made in the cost of:

Overhead Cost Control NOTES Self-Instructional Material 145 (i)

work-in-progress; (ii) finished stock; and (iii) cost of sales. In the case of under-absorption, the overhead cost is adjusted by a plus rate since the amount is to be added, whereas

over-absorption is adjusted by a minus rate since the amount is to

be deducted. Illustration 6.8: A company absorbs overheads on predetermined rates. For the year ending 31 Dec. 2009, factory overheads absorbed were ₹3,66,250. Actual amount of overheads incurred totalled ₹4,26,890. The following figures are also derived from the trial balance. Finished stock ₹2,30,732 Cost of goods sold ₹8,40,588 Work-in-progress ₹1,41,480 How would you dispose of under/over-absorbed overheads by use of supplementary rate method. Solution:

Under-absorbed overheads = Actual overheads – Absorbed overheads = ₹4,26,890 – ₹3,66,250 = ₹60,640 Total cost incurred = ₹230,732 + ₹840,588 + ₹1,41,480 = ₹12,12,800 Supplementary Rate = ?

Unabsorbed amount 60,640

Total cost 12,12,800 As there is under-absorption of overheads, it is a plus rate, i.e., the cost of finished goods, work-in-progress and cost of goods sold will be increased by 5% as shown below: Finished goods = ₹2,30,732 × 5% = ₹11,536.60 Work-in-progress = ₹1,41,480 × 5% = ₹7,074.00 Cost of goods sold = ₹8,40,588 × 5% = ₹42,029.40 Total 60,640.00 2.

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off to Costing Profit and Loss Account: This method is used when the under or over-

absorbed amount is quite negligible and it is not worthwhile to absorb it by supplementary rate. Under-absorption due to abnormal factors, like idle capacity or defective planning, is also transferred to Costing Profit and Loss Account. This method suffers from the shortcoming that stocks of work-in-progress and finished goods remain under or over-valued and are carried over

to the next accounting period at such values. 3. Carry over to

the next year: Under this method the under or over-absorbed amount is transferred to Overhead Reserve Account or Suspense Account for carrying over to the next accounting year. This procedure is open to criticism on

Overhead Cost Control NOTES Self-Instructional 146 Material

the ground that it is not logical to carry over the overheads of one year to the subsequent years for absorption. But, this method can be usefully employed where

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normal business cycle extends over more than one year and overheads are determined on a long-term basis.

Illustration 6.9: During the year ending 31 March 2009, the factory overhead costs of three production departments of an organization are as under— X ₹48,950 Y ₹89,200 Z ₹64,500 The basis of absorption of overheads is given below:

Department X ₹5 per machine

hour for 10,000 hours Y 75% of direct labour cost of ₹1,20,000 Z ₹4 per piece for 15,000 pieces

Calculate the department-wise under or over-absorption of overheads and present the data in a tabular form. Solution:

Amount of cost absorbed factory overheads is calculated as follows: X @ ₹5 per machine

hour for 10,000 hours 50,000 Y @ 75% of direct labour cost of ₹1,20,000 90,000 Z @ ₹4 per piece for 15,000

piece 60,000 Total overheads absorbed 2,00,000 Statement Showing Department-wise Under/Over-absorption
Department Actual Absorbed Under Over overheads overheads absorption absorption ` ` ` ` X 48,950 50,000 – 1,050 Y
89,200 90,000 – 800 Z 64,500 60,000 4,500 – Total 2,02,650 2,00,000 4,500 1,850 Net under-absorption (‘)= 4,500 –
1,850 = 2,650 or 2,02,650 – 2,00,000 = ` 2,650 Check Your Progress 7. State the difference between selling and
distribution cost. 8. Under what circumstances can under and over absorption of overheads occur?

Overhead Cost Control NOTES Self-Instructional Material 147 6.7

ANSWERS TO CHECK YOUR PROGRESS QUESTIONS 1. Production overhead is also known as factory overhead, works
overhead or manufacturing overhead. 2. Fixed overheads remain unaffected or fixed in total amount by fluctuations in
volume of output. Variable overhead is the cost which, in aggregate, tends to
vary in direct proportion to changes in the volume of
output. Variable overhead per unit remains fixed. 3.

The purpose of both cost allocation and cost apportionment is the identification or allotment of items of cost to cost
centres or cost units. However, the main difference between the two procedures is that while
allocation deals with whole items of costs, apportionment deals with proportions of items
of cost. 4.

Under

trial and error

method,

the cost of first service department is apportioned to

other service departments only in the given percentage. The cost of the second service department

then is apportioned to the first and other service departments. 5.

There are

two steps in the absorption of overheads: Computation of overhead absorption rate, and Application of these rates to
cost

units. 6.

Machine hour rate is the overhead cost of running a machine for one hour. This rate is obtained

by dividing the amount of factory overhead apportioned to a machine by the number of machine hours for the period
under consideration. 7.

Selling cost is ‘

the cost of seeking to create and stimulate demand (sometimes termed marketing) and of securing orders.’

These costs are thus incurred for increasing sales to the existing and potential customers.’

Distribution cost is ‘the cost of the sequence of operations

which begins with making the packed product available for dispatch and ends with making the
re- conditioned returned empty

packages, if any, available for re-use.’ 8.

Under-

or over-absorption

of overheads may

arise due to one or more of the

following reasons: Faulty estimation of overhead costs,

Faulty estimation of the

quantity

of output,

Seasonal fluctuation in the amount of overheads in certain industries,

Unforeseen

changes in the production capacity, and Unexpected changes in the method of production affecting changes in the
amount of overheads.

Overhead

Cost Control NOTES Self-Instructional 148 Material 6.8 SUMMARY ?

Total cost may be classified into direct cost and indirect cost. The total of all direct costs

is known as Prime cost and the total of all indirect costs is termed as Overhead cost. ? Classifications of overhead costs: functions, elements and behaviour. ? On the basis of functions, overheads may be classified into: (i) production overheads, (ii) administration overheads, and (iii) selling and distribution overheads. ? On the basis of behaviour, overheads may be classified into: (i) fixed overhead, (ii) variable overhead, and (iii) semi-fixed or semi-variable overhead. ? On the basis of behaviour, overheads may be classified into: (i) indirect materials, (ii) indirect wages and (iii) indirect expenses. ? After overhead costs have been collected under various standing order numbers, the next step is to allocate and apportion the overheads to production and service departments. ?

Allocation' is a direct process, but 'apportionment' may be made only indirectly and for which suitable bases are to be selected. ?

Apportionment on reciprocal basis method is used when service departments are mutually dependent. ?

The absorption of overheads is the last step in the distribution plan of overheads. ?

Overhead rates may be (i) actual or pre-determined; and (ii) blanket or multiple. ? Office and administration overheads pertain to general management and administration of business. They may be defined as the indirect expenditures incurred in

formulating the

policy, directing the organization and controlling the operations

of

an

undertaking. ?

Selling overheads are incurred for promoting sales and securing orders while distribution overheads are mainly incurred in moving the goods from the company's godown to customers' place. ? Whenever the overheads absorbed are not equal to the amount of actual overheads, it is a case of either under-absorption or over-absorption of overheads.

Overhead Cost Control NOTES Self-Instructional Material 149 6.9

KEY WORDS ? Allocation: It

is

charging to a cost centre those overheads that result solely from the existence of that cost

centre ?

Apportionment:

It is charging a fair share of an overhead to a cost centre ?

Distribution Overhead:It comprises

all expenditure incurred from the time

the product is completed in the factory till it reaches its destination

or customer;

includes packing cost, carriage outward, delivery van expenses, warehousing costs, etc. ?

Idle Capacity: This is

the difference between practical capacity and capacity based on sales expectancy

or actual capacity ? Production Overhead: It is

the aggregate of factory indirect material cost, indirect wages and indirect expenses ?

Selling Overhead: It

is

the cost of seeking to create and stimulate demand

or of securing orders 6.10

SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer

Questions 1. What is the advantage of classifying overheads into fixed and variable items? 2.

List the steps taken for distribution of overhead costs. 3.

State the objectives of departmentalization. 4. What are the principles of apportionment? 5. State the steps involved in the computation of machine hour rate. 6.

What are the special features of selling and distribution overhead?

Long Answer Questions 1. What are the different methods of classifying overheads? Indicate the advantages of classifying overheads on the basis of variability. 2. Explain with illustration the classification of 'fixed', 'semi-fixed' and 'variable' expenses. 3

What are the bases of apportionment of overhead expenses among departments? Name the overhead for which each basis will be suitable. 4.

A factory has three production departments. The policy of the factory is to recover the production overheads of the entire factory by adopting a single

Overhead Cost Control NOTES Self-Instructional 150 Material

blanket rate based on the percentage of total factory overheads to total factory wages. The relevant data for a month are given as follows: Departments Direct Direct Factory Direct Machine Materials Wages Overheads Labour Hours ` ` Hours
Budget: Machining 6,50,000 80,000 3,60,000 20,000 80,000 Assembly 1,70,000 3,50,000 1,40,000 1,00,000 10,000
Packing 1,00,000 70,000 1,25,000 50,000 — Actuals: Machining 7,80,000 96,000 3,90,000 24,000 96,000 Assembly
1,36,000 2,70,000 84,000 90,000 11,000 Packing 1,20,000 90,000 1,35,000 60,000 — The details of one of the
representative jobs produced during the month are as under: Job No. CW 7083 Department Direct Direct Direct
Machine Materials Wages Labour Hours ` Hours Machining 1,200 240 60 180 Assembly 600 360 120 30 Packing 300 60
40 — The factory adds 30%

on the factory cost to cover administration and selling overheads and

profit. Required: (i) Calculate the overheads absorption rate as per the current policy of the company and determine the selling price of the job No. CW 7083. (ii) Suggest any suitable alternative method(s) of absorption of the factory overheads and calculate the overhead recovery rates based on the method(s) so recommended by you. (iii) Determine the selling price of job No. CW 7083 based on the overhead application rates calculated in (ii) above. (iv) Calculate the department-wise and total under or over-recovery of overheads based on the company's current policy and the method(s) recommended by you. [Ans. (i) 125%; Selling price ` 4,660.50; (ii) Machining dept.— Machine hour rate ` 4.50, Assembly dept.— Direct labour hour rate ` 1.40; Packing dept. Direct labour hour rate ` 2.50, (iii) ` 4,989.40; (iv) Over/under (-) recovery; Current Method—Machining ` 2,70,000 (-); Assembly ` 2,53,500; Packing ` 22,500 (-) As per recommended method— Machining ` 42,000; Assembly ` 42,000; Packing ` 15,000]

Overhead Cost Control

NOTES Self-Instructional Material 151 6.11 FURTHER READINGS

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Methods of Costing: Job

Costing NOTES Self-Instructional 152 Material BLOCK - II TYPES OF COSTING

UNIT 7

METHODS OF COSTING: JOB COSTING Structure 7.0 Introduction 7.1 Objectives 7.2

Job Costing 7.3 Contract Costing, Target Costing and

Escalation Clause 7.4 Answers to Check Your Progress Questions 7.5 Summary 7.6 Key Words 7.7 Self Assessment

Questions and Exercises 7.8 Further Readings 7.0 INTRODUCTION

Determining the cost of production is different in varied industries. Some of the factors which affect the method of costing are the manufacturing process as well as the method that is utilized by the industry for measuring the finished product of the final output. You have already learnt in Unit 2 that methods of costing are mainly of two types: Specific order costing (job or terminal costing) and Operation costing (Process or period costing).

In this unit, you will learn about the concept of

specific order costing including a focus on job costing and a mention of contract costing. You will learn the other types of costing including unit costing, process costing, contract costing, operating costing, batch costing and standard costing in the subsequent units. 7.1

OBJECTIVES After going through this unit, you will be able to: ? Describe the meaning and objective of job costing ?

Explain the

job costing procedure ? Discuss the features of contract costing

Methods of Costing: Job Costing NOTES Self-Instructional Material 153 7.2 JOB COSTING

All industries may be broadly classified into two categories: 1. Job order industries 2. Mass production industries In job order industries, production work is done against orders from customers. Each job work needs special treatment and can be clearly distinguished from other jobs. Each job is completed as per customer's specifications. Examples of job order industries are printing press, construction of buildings, bridges, roads

and

ship building In mass production, firms manufacture uniform types of products. Since production is of standard products, it is on a mass scale and on a continuous basis. No customer order or specifications are required for production.

Examples of mass production industries are textiles, paper, sugar, chemicals and steel.

Job

costing

Job costing or job order costing is a method of cost ascertainment used in job order industries. Special features of such industries are as follows: (a)

Production is against customer's orders and not for stocks. (b) Each job has its own characteristics and requires special attention. (

c) The flow of production from one department to another is not uniform. It is the nature of job which determines the department through which it is to be processed.

Objectives

of Job Costing The following are the main

objectives of job costing: 1.

Cost of each job/order is ascertained separately. This helps in finding

out the

profit or loss on each individual job. 2. It enables the

management to know those jobs which are more profitable and those which are unprofitable. 3.

It provides

a basis

for determining the cost of similar jobs undertaken in future.

It thus helps in future production planning. 4. It helps the management

in controlling costs by comparing the actual costs with the estimated costs.

Job Costing

Procedure

The following steps are taken

in job costing: 1. Job number: When an order has been accepted, an individual job number must be assigned to each job so that separate jobs are identifiable at all stages of

Methods of Costing: Job

Costing NOTES Self-Instructional 154 Material

production. Assignment of job numbers also facilitates reference for costing purposes in the ledger and is conveniently short for use on various forms and documents. 2. Production order: The production control department then makes out a Production Order, thereby authorizing to start work on the job. Several copies of the production order are prepared, the copies often being in different colours to distinguish between them more easily. These copies are passed on to the following: (i) All departmental foremen concerned with the job (ii) Storekeeper for issuance of materials (iii) Tool room for an advance notification of tools required

Fig. 7.1 Production Order for Job

The columns provided in the production order differ widely, depending largely upon the nature of production.

Sometimes orders are accompanied by the blue prints and contain a bill of materials and detailed instructions as to

which tools and machinery are to be used. 3. Job cost sheet: The unique accounting document under job costing is the job cost sheet. Receipt of production order is the signal for the cost accountant to prepare a job cost sheet on which he will record

the cost of materials used and the labour and machine time taken. Each concern has to design a job cost sheet to suit its needs.

A simple pro forma of

job cost sheet is given

in Fig. 7.2.

Job cost sheets are not prepared for specified periods but they are made out for each job regardless of the time taken for its completion. However, material, labour and overhead

costs are posted periodically to the relevant cost sheet.

Methods of Costing: Job Costing NOTES Self-Instructional Material 155 Fig. 7.2 Job

Cost Sheet

The material, labour and overheads to be absorbed into jobs are collected and recorded in the following way: (a) Direct materials:

Material requisitions

or bills on materials show the quantities of materials issued to jobs from store. When copies of these documents reach the cost office, they are priced and entered in the stores ledger account in the 'issues' column. Each requisition shows the job number to which the material is to be charged. Summaries of material requisitions are prepared at regular intervals on Materials Abstract or Materials Issue Analysis Sheet. These summaries facilitate debiting the job with total cost of materials rather than charging with many small items. These totals are also used for entries in stores ledger control account and work-in-progress control account. (b) Direct wages: As explained earlier in the unit on labour cost, the wages payable to workers are calculated on clock cards, job cards, time sheets, etc. The summaries of job cards are made on Wages Abstract or Wages Analysis Sheets, which show the direct wages chargeable to each job. The total of wages chargeable to various jobs is debited to work-in-progress control account. (c) Direct expenses: Direct expenses which can be identified with specific jobs are directly charged to these jobs, the total being debited to work-in-progress control account.

Methods of Costing: Job Costing NOTES Self-Instructional 156 Material (

d) Overheads: Indirect materials, indirect wages and indirect expenses which cannot be identified with specific jobs are apportioned to cost centres in the manner described earlier in the Unit 6.

Absorption of overheads by the jobs passing through the cost centres is based upon percentage of direct wages or direct material cost, direct labour hours or machine hours, etc.

These methods of absorption have also been discussed in detail in Unit 6.

The direct materials, wages and expenses and the overheads absorbed are totalled to give the total cost. Completion of Jobs When jobs are completed, the cost is transferred to cost of sales account. The total cost of jobs completed during each period is set against the sales to determine the profit or loss for the period. Illustration 7.1: A factory uses job costing. The following data are obtained from its books for the year ended 31 December 2017:

Direct materials 90,000 Selling and distribution overheads 52,500 Direct wages 75,000 Administration overheads 42,000 Profit 60,900 Factory Overheads 45,000 (a) Prepare a Job Cost Sheet indicating the Prime cost, Works cost, Production cost, Cost of sales and the Sales value. (b) In 2018, the factory received an order for a number of jobs.

It is estimated that direct materials required will be ₹ 1,20,000 and direct labour will cost ₹ 75,000. What should be the price for these jobs if factory intends to earn the same rate of profit on sales assuming that the selling and distribution overheads have gone up by 15%? The factory recovers

factory

overheads

as a percentage of direct wages and administration and selling and distribution overheads as a percentage of works cost, based on cost rates prevailing in the previous year. (

CA Inter) Solution: Production Statement for the year ended 31 December 2017

Direct materials 90,000

Direct

wages 75,000 Prime Cost 1,65,000 Factory overheads 45,000 Works Cost 2,10,000 Administration overheads 42,000

Cost of Production 2,52,000 Selling and distribution overheads 52,500 Cost of

Sales 3,04,500

PROFIT 60,900

Sales

Value 3,65,400

Methods of

Costing: Job Costing NOTES Self-Instructional Material 157

Calculation

of Rates 1. % of factory overheads to direct wages = $\frac{45,000}{75,000} \times 100 = 60\%$ 2. % of administration overheads to works cost = $\frac{42,000}{2,10,000} \times 100 = 20\%$ 3. Selling and distribution overheads ₹ 52,500 Add 15% increase 7875 60,375

Selling and distribution overheads % to works cost = $\frac{60,375}{2,10,000} \times 100 = 28.75\%$ 4. % of profit to sales = $\frac{60,900}{3,65,400} \times 100 = 16.67\%$ 1 1

of sales or of total cost 6 5 ? ? ? ? ?

Job Cost Sheet (Statement showing Estimated Cost and Price of Jobs in 2018)

Direct materials 1,20,000 Direct wages 75,000

Prime Cost 1,95,000 Factory overheads (60% of direct labour) 45,000 Works Cost 2,40,000 Administration overheads (20% of works cost) 48,000 Cost of Production 2,88,000

Selling

and distribution

overheads (28.75% of works cost) 69,000 Total Cost 3,57,000 PROFIT (1/5

of cost) 71,400

Selling Price 4,28,400 7.3

CONTRACT COSTING,
TARGET
COSTING
AND ESCALATION CLAUSE

Contract costing, also known as terminal costing, is a variant of job costing. In this method of costing, each contract is a cost unit and an account is opened for each contract in the books of the contractor to ascertain profit/loss thereon.

Contract Costing and Job Costing—Distinction Main points of distinction between contract and job costing are as follows: 1. The number of jobs undertaken at a time are usually large as compared to number of contracts because contracts are generally much bigger in size.

Methods of Costing: Job Costing NOTES Self-Instructional 158 Material 2.

In contract costing, most of the costs are chargeable direct to contract accounts. Under job costing, direct allocation to such an extent is not possible. 3. Allocation and apportionment of overhead costs is simpler in contract costing as compared to job costing. 4. Contract is generally big while job is small. It is well said, 'a job is a small contract and a contract is a big job.' 5. Jobs are usually carried out in factory premises while contract work is done at site. Features of Contract

Costing

Contract costing usually shows the following features: 1.

Contracts are generally of large size and, therefore,

a contractor usually carries out a small number of contracts in

the course of one year. 2. A contract generally takes more than one year to complete. 3. Work on contracts is carried out

at the site of contracts and not in factory premises. 4. Each contract undertaken is treated as a cost unit. 5. A separate

contract account is prepared for each contract in the books of the contractor to ascertain profit or loss on each

contract. 6. Most of the materials are specially purchased for each contract. These will, therefore, be charged direct from

the supplier's invoices. Any materials drawn from the store is

charged to contract on the basis of material requisition notes. 7. Nearly all labour is direct. 8.

Most expenses (e.g., electricity, telephone, insurance, etc.) are also direct. 9. Specialist sub-contractors may be employed

for say, electrical fittings, welding work, glass work, etc. 10. Plant and equipment may be purchased for the contract or

may be hired for the duration of the contract. 11. Payments by the customer (contractee) are made at various stages of

completion of the contract based on architect's certificate for the completed stage. An amount, known as retention

money, is withheld by the contractee as per agreed terms. 12.

Penalties may be incurred by the contractor for failing to complete the work within the agreed

period.

Methods of

Costing: Job Costing NOTES Self-Instructional Material 159 Target Costing This method of costing is used to calculate

product costs by deducting desired profit margin from market price of the product/service. This setting of cost is the

reverse of cost-plus pricing (discussed in Unit 10). It is known as the method of cost reduction/optimization method. The

following are the fundamental steps of target costing: ? Estimate competitive sales price ? Setting of the desired and

reasonable profit margin ? Calculate target costs = estimated selling price less desired profit margin ? Ascertain the

actual costs of the product ? Calculate cost gap = difference between actual and target costs ? Try to eliminate (or

reduce) the cost You will learn more about the concept, types and procedure of contract costing in Unit 10. Check Your

Progress 1. Mention examples of job order industries. 2.

List the people to whom the production order copies are passed on to. 3. What

is the signal for the cost accountant to prepare a job cost sheet? 7.4

ANSWERS TO CHECK YOUR PROGRESS QUESTIONS 1.

Examples of job order industries include printing press, construction of buildings, bridges, roads

and ship building. 2.

The production order copies are passed on to the following people: ?

All departmental foremen concerned with the job ? Storekeeper for insurance of materials ? Tool room for an advance

notification of

tools required 3.

Receipt of production order is the signal for the cost accountant to prepare a job cost sheet on which he will record

the cost of materials used and the labour and machine time taken. 7.5

SUMMARY ?

In job order industries, production work is done against orders from customers. Each job work needs special treatment and can be clearly

Methods of Costing: Job Costing NOTES Self-Instructional 160 Material

distinguished from other jobs. Each job is completed as per customer's specifications. ?

Job costing or job order costing is a method of cost ascertainment used in job order industries. ?

Objectives of job costing are: cost of each job is ascertained separately, it enables management to know which jobs are more profitable, helps in future production planning and helps in management in controlling costs by comparing estimated and actual costs. ? The steps in the job costing procedure include: assigning of job number, making of the production order, preparation of job cost sheet, and completion of jobs to cost of sales account. ?

Contract costing, also known as terminal costing, is a variant of job costing. In this method of costing, each contract is a cost unit and an account is opened for each contract in the books of the contractor to ascertain profit/ loss thereon. 7.6

KEY WORDS ? Job Order Industries: It refers to industries where production work is done against orders from customers ? Job

Costing: It

is a method of cost ascertainment used in job order industries ?

Contract Costing: Also known as terminal costing, it is a method of costing in which each each contract is a cost unit and an account is opened for each contract in trhe books of the contractor to ascertain profit/loss thereon 7.7

SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer Questions 1. Write a note on job costing and the industries which adopt job costing. 2. What are the main features of job costing? Give a pro forma cost sheet under such a system. 3.

Differentiate between contract and job costing.

Long Answer Questions 1.

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What are the main features of job costing? Describe briefly the procedure of recording costs under job order costing. 2.

Discuss the features of contract costing.

Methods of Costing: Job Costing NOTES Self-Instructional Material 161 3. R K Ltd has to quote a price for Job No. 450. The cost estimator has produced the following data: Direct materials: 34 units @ ` 2 per unit Direct labour: Deptt A – 12 hours @ ` 2 per hour Deptt B – 20 hours @ ` 1.80 per hour The following additional information is extracted from the company's budgets: Deptt A variable overheads ` 18,000 Hours to be worked ` 18,000 Deptt B variable overheads ` 18,000 Hours to be worked ` 10,000 Fixed overheads for the company ` 1,00,000 Total hours to be worked ` 50,000 Profit is taken at 20% of the selling price. You are required to prepare a Job Cost Sheet. 7.8

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Unit

Costing NOTES Self-Instructional 162 Material UNIT 8 UNIT COSTING Structure 8.0 Introduction 8.1 Objectives 8.2

Meaning of Unit Costing 8.2.1 Procedure in Unit Costing

and Preparation of Cost Sheet 8.3

Answers to Check Your Progress Questions 8.4 Summary 8.5 Key Words 8.6 Self Assessment Questions and Exercises 8.7

Further Readings 8.0 INTRODUCTION In the previous unit, you learnt about the concept of job costing

and contract costing. In this unit, you will study unit costing. Cost ascertainment in industries where similar or singular grade products are manufactured is done through unit costing. Examples of such industries include paper, bricks, steel, breweries, dairies, sugar mills, etc. Unit costing helps to determine not just the total cost of production but also cost per unit. It has several other advantages including assistance in the determination of selling price of the product, get an idea about the profitable volume of product, have a control of the costs, compare previous and current costs, etc.

In this unit, you will learn about the concept of

unit costing, the costing procedure, the purposes

and preparation of cost sheet. 8.1

OBJECTIVES After going through this unit, you will be able to: ? Explain the meaning of unit costing ?

Describe cost accumulation ? Discuss the procedure in unit costing and the preparation of cost sheet 8.2 MEANING OF UNIT COSTING Output costing (or unit costing or single

costing) is a method of cost ascertainment which is used in those industries

which have the following features: (i) Production consists of a single product or a few varieties of the same product with variations in size, shape, quality, etc., and (ii) Production is uniform and on continuous basis.

Unit Costing NOTES Self-Instructional Material 163 Cost Accumulation Collecting cost information through a formal accounting system is known as cost accumulation in cost accounting. This cost information is extremely crucial to the management of the companies as through its analysis and study, they become equipped to take efficient and effective decisions for the company. Broadly cost accumulation can be divided into two categories: ? Job cost system ? Process cost system As the name suggests, the former is related to collection of costs related to material, labour and overhead for individual jobs, whereas the latter is concerned with accumulating costs by cost centre and then assigning an average cost to the products. Cost accumulation under unit costing, requires information related to cost of raw materials consumed, cost of labour and cost of overheads.

8.2.1 Procedure in Unit Costing and Preparation of Cost Sheet
In order to ascertain the cost of products, a cost sheet is prepared periodically. As the production is uniform and cost units are identical,

the cost per unit is the average cost. It is ascertained by dividing the total cost by the number of units produced.

Cost unit may be 1,000 bricks, a barrel of beer, a gallon of milk, a tonne of steel/ cement/sugar, etc. The cost sheet is designed to show the total cost as well as cost per unit of output for the given period.

Cost Sheet

Cost sheet is defined

as ‘

a

document which provides for the assembly of the detailed cost of a cost centre or cost unit.’

Thus cost sheet

is

a periodical

statement

of cost,

designed to show in detail the various elements of cost of goods produced, like prime cost, factory

cost,

cost of production and total cost.

It is prepared at regular intervals, e.g., weekly, monthly, quarterly, yearly, etc. Comparative figures of the previous period may also be shown in the cost sheet so that assessment can be made about the progress of the business. Though the term Production Statement is used interchangeably with Cost Sheet, the former is an expanded form of the latter. In addition to cost elements, a production statement includes items of sales, stocks and profits. When the details of cost sheet or production statement are shown in a T-shape account, it is known as Production Account. Other terms used are Cost Statement and Statement of Cost and Profit.

Purposes: Cost sheet

serves the following purposes: 1. It reveals the total cost and cost per unit of goods produced. 2. It discloses the break-up of total cost into different elements of cost.

Unit Costing NOTES Self-Instructional 164 Material 3.

It

provides a comparative study of the cost of current period with that of the corresponding previous period. 4. It acts as a guide to management in fixation of selling prices and quotation of tenders.

Specimen

of a simple cost sheet is given below:

Cost Sheet (

or Statement of Cost) for the period..... No. of

units produced.....

Particulars Total Cost per cost unit ` `

Direct Materials Direct Labour Direct (or Chargeable) Expenses

Prime Cost Works Overheads Works Cost

Office and Administrative Overheads
 Cost of Production
 Selling and Distribution Overheads
 Total Cost
 or Cost of
 Sales
 Profit
 or Loss Sales
 Treatment of Stocks Stocks may be of the following

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three types: (a) Stocks of raw materials (b) Stocks of work-in-progress (c) Stocks of finished goods

Stocks of Raw Materials: In order to calculate the value of raw materials consumed during the period, opening stock of raw materials is added to the raw materials purchased and closing stock is subtracted. This is shown below with assumed figures:

Opening stock of raw materials 12,000 Add: Purchases 42,000 54,000 Less: Closing stock of raw materials 9,000 Cost of materials consumed 45,000

Stocks of Work-in-progress:

This is the stock of semi-finished goods. In cost sheet, opening stock of work-in-progress is added in prime cost along with factory overhead and closing stock of work-in-progress is subtracted therefrom. Thus opening and closing stocks of work-in-progress are adjusted in works or factory cost as shown below (with assumed figures):

Unit Costing NOTES Self-Instructional Material 165 Prime cost 62,000 Add: Factory overheads 27,000 Current manufacturing cost 89,000 Add: Opening stock of work-in-progress 13,000 Total goods processed during the period 1,02,000

Less: Closing stock of work-in-progress 11,000 Works or factory cost 91,000 Stock of Finished Goods: In cost sheet, finished goods are adjusted after calculating cost of production. Opening stock of finished goods is added

to cost of production and closing stock of finished goods is subtracted therefrom. The resultant figure is called cost of goods sold. This is illustrated below (with assumed figures):

Cost of production 1,15,000 Add: Opening stock of finished goods 17,000 Cost of goods available for sale 1,32,000 Less: Closing stock of finished goods 12,000 Cost of goods sold 1,20,000

The treatment of the above three types of stocks is illustrated in the following specimen

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cost sheet. Cost Sheet for the period..... Production.....units. Particulars Total cost Cost per unit ` ` Opening stock of raw materials XXX Add: Purchases XXX Add: Expenses on purchases XXX XXX Less: Closing stock of raw

materials XXX Cost of material consumed Direct wages Direct expenses Prime Cost Add: Factory overheads Add: Opening stock of work-in-progress Less: Closing stock of work-in-progress Factory or Works Cost Add: Administrative overheads Cost of Production Add: Opening stock of finished goods Less: Closing stock of finished goods Cost of Goods Sold Add: Selling and distribution overheads Cost of Sales

Profit (or Loss) Sales

Unit

Costing NOTES

Self-Instructional 166 Material

Items Excluded from Cost The following items are of financial nature and are

thus not included while preparing a cost sheet: 1. Cash discount 2. Interest paid 3. Preliminary expenses written off 4. Goodwill

written off 5. Provision for taxation 6. Provision for bad debts 7.

Transfer to reserves 8. Donations 9. Income tax paid 10. Dividend paid 11. Profit/loss on sale of fixed assets 12. Damages payable at law, etc.

Treatment of Scrap Scrap may be defined as an unavoidable residue material arising in certain types of manufacturing processes. Examples of scrap are trimmings, turnings or boring from metals or timber, on which operations are performed. Scrap usually has a small realizable value. Such realizable value of scrap is deducted from either factory overheads or factory cost while preparing a cost sheet. Illustrative

Cost Sheet (Detailed)

Units

produced..... Particulars Total cost Cost per unit ` `

Opening Stock of Raw Materials

Add: Purchases Add:

Carriage Inward Add: Octroi and Customs Duty

Less: Closing Stock of Raw Materials Cost of Direct Materials Consumed Direct or Productive

Wages Direct (or Chargeable) Expenses Prime Cost Add:

Works or Factory Overheads: ...

Indirect Materials ... Indirect Wages ...

Leave Wages ... Overtime Premium ... Fuel and Power ... Rent and Taxes ... Insurance ...

Unit Costing NOTES Self-Instructional Material 167

Factory Lighting ... Supervision ... Works Stationery ... Canteen and Welfare Expenses ... Repairs ... Haulage ... Works

Salaries ... Depreciation of Plant & Machinery ... Works Expenses ... Gas and Water ...

Drawing Office Salaries ... Technical Director's Fees ... Laboratory Expenses ... Works Telephone Expenses ... Internal

Transport Expenses ... Less: Sale of Scrap ...

Add: Operating Stock of Work-in-progress ... Less: Closing Stock of Work-in-progress ...

Works Cost ...

Add: Office and Administrative Overheads: ...

Office Salaries Director's Fees Office Rent and Rates Office Stationery and Printing Sundry Office Expenses

..... Depreciation of Office Furniture Subscription to Trade Journals Office Lighting Establishment Charges

Director's Travelling Expenses Postage Legal Charges Audit Fees Depreciation and Repair of

Office Equipment

Cost of Production Add: Opening Stock of Finished Goods Less: Closing Stock of Finished Goods Cost of Goods Sold

Add: Selling

and Distribution

Overheads:

Advertising Showroom Expenses Bad Debts Salesmen's Salaries and Expenses Packing Expenses Carriage

Outward Commission of Sales Agents Counting House Salaries Cost of Catalogues Expenses of Delivery

Vans Collection Charges Travelling Expenses Cost of Tenders Warehouse Expenses Cost of Mailing

Literature Sales Manager's Salaries

Unit Costing NOTES Self-Instructional 168 Material

Sales Director's Fees Showroom Expenses Sales Office Expenses Depreciation and Repairs of Delivery Vans Expenses of

Sales Branches Cost of Sales (or Total Cost)

PROFIT Sales

Illustration 8.1:

94%

MATCHING BLOCK 41/95

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Cost Accounting, Study Material- new.pdf (D44082039)

The following particulars have been extracted from the books of J K Production Co. Ltd, for the year ended 31 March 2010. Stock of materials as on 1 April 2009 47,000 Stock of materials as on 31 March 2010 45,000 Materials purchased 2,08,000 Drawing office salaries 9,600 Counting house salaries 14,000 Carriage inwards 8,200 Carriage outwards 5,100 Donations to relief fund 4,300 Sales 4,87,000 Bad debts written off 4,700 Repairs of plant, machinery and tools 8,600 Rent, rates, taxes and insurance (factory) 3,000 Rent, rates, taxes and insurance (office) 1,000 Travelling expenses 3,700 Travelling salaries and commission 7,800 Production wages 1,45,000 Depreciation written off on machinery, plant and tools 9,100 Depreciation written off on office furniture 600 Director's fees 6,000 Gas and water charges (factory) 1,000 Gas and water charges (office) 300 General charges 5,000 Manager's salary 18,000 Out of 48 working hours in a week, the time devoted by the manager to the factory and office was on an average 30 hours and 18 hours, respectively, throughout the accounting year. Prepare a

cost sheet showing different elements of cost.

Unit Costing NOTES Self-Instructional Material 169

Solution: Cost Sheet

for the year ending 31 March 2010

Opening stock of raw materials 47,000 Add: Purchases 2,08,000 Add: Carriage inwards 8,200 2,63,200

Less: Closing stock 45,000 Cost of materials consumed 2,18,200

Production wages 1,45,000 Prime Cost 3,63,200

Factory

overheads:

Rent and rates 3,000 Drawing office salaries 9,600 Depreciation of plant 9,100 Repairs of plant 8,600 Factory

gas and water 1,000 Manager's salary 30 18,000 48 ? ? ? ? ? 11,250 42,550 Factory Cost 4,05,750 Administration

overheads: Office rent and rates 1,000 Depreciation on furniture 600 Director's fees 6,000 Gas and water 300 General

charges 5,000 Manager's salary 18 18,000 48 ? ? ? ? ? 6,750 19,650

Cost of production 4,25,400 Selling and distribution overheads: Counting house salaries 14,000 Carriage outwards 5,100

Bad debts 4,700 Travelling expenses 3,700 Travelling salaries 7,800 35,300 Cost of Sales 4,60,700

PROFIT 26,300 Sales 4,87,000 Note: Donation to

relief fund is not included in cost. Production Account When information shown in a cost sheet

71%

MATCHING BLOCK 42/95

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is presented in the form of a T-shape account, it is known as Production Account.

In this account, debit side shows the various item of cost while credit side shows the sales of finished goods. Opening stock is written on the debit side while closing stock is written on the credit side. Alternatively, closing stock may be shown as a deduction from the items in debit side. In this way this account shows the total cost. The balance in this account shows profit or loss, as the case may be.

Unit Costing NOTES Self-Instructional 170 Material

Illustration 8.2: Prepare a Production Account from the information extracted from the books of J K Production Co. Ltd as given in Illustration 8.1. Solution: Production Account for the year ending 31 March 2010

To Opening stock of raw materials 47,000 By Prime cost c/d 3,63,200 Add: Purchases 2,08,000 Add: Carriage inwards 8,200 2,63,200 Less:

Closing stock 45,000 Cost of materials consumed 2,18,200 To Production wages 1,45,000 3,63,200 3,63,200 To Prime

Cost b/d 3,63,200 By Factory cost c/d 4,05,750 To Factory overheads: Rent and rates 3,000 Drawing office salaries 9,600

Depreciation of plant 9,100 Repairs of plant 8,600 Factory gas and water 1,000 Manager's salary (18,000 × 30/48) 11,250

4,05,750 4,05,750 To Factory Cost b/d 4,05,750 By Cost of production c/d 4,25,400 To Administration overheads: Office

rent and rates 1,000 Depreciation on furniture 600 Director's fees 6,000 Gas and water 300 General charges 5,000

Manager's salary (18,000 × 18/48) 6,750 4,25,400 4,25,400 To Cost of Production b/d 4,25,400 By Cost of sales c/d

4,60,700 To Selling and dist. overheads: Counting house salaries 14,000 Carriage outwards 5,100 Bad debts 4,700

Travelling expenses 3,700 Travelling salaries, etc. 7,800 4,60,700 4,60,700 To Cost of Sales b/d 4,60,700 By Sales 4,87,000

To Profit 26,300 4,87,000 4,87,000

Price Quotations and Estimated Cost Sheet

Quite often the management has to quote prices of its products in advance or has to submit tenders for goods to be supplied. For this purpose an estimated cost sheet has to be prepared. Such an estimated cost sheet is prepared to show the estimated cost of products to be manufactured. In this cost sheet, cost of direct materials, direct wages and various types of overheads are predetermined on the

Unit Costing NOTES Self-Instructional Material 171

basis of past costs after taking into account the present conditions and also the anticipated changes in the future price level. Overheads are absorbed on the basis of a suitable method of absorption like percentage of direct materials, or wages or machine hour rate, etc. These methods were discussed in the overhead chapter. Calculation of profit: After the total cost has been estimated, a desired percentage of profit is added to arrive at the price to be quoted. Such profit may be given as a percentage of cost or percentage of selling price. In order to calculate the amount of profit, it is easy to assume that figure as 100 on which profit percentage is given and then calculate the amount of profit. Example 1: Given: Total cost = `50,000 Profit = 20% of cost Suppose cost = `100 Profit = $100 \times 20\% = `20$? When cost is `50,000: Profit = $50,000 \times 20 / 100 = `10,000$

Check Your Progress 1.

What are the three types of stocks? 2. What are the inclusions of the estimated cost sheet for quotations? 3. How is profit calculated for the estimated cost sheet? 8.3 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS 1.

The three types

of stocks include: ? Stocks of raw materials ? Stocks of work-in-progress ? Stocks of finished goods 2.

An estimated cost sheet is prepared to show the estimated cost of products to be manufactured. In this cost sheet, cost of direct materials, direct wages and various types of overheads are predetermined on the basis of past costs after taking into account the present conditions and also the anticipated changes in the future price level. 3. After the total cost has been estimated, a desired percentage of profit is added to arrive at the price to be quoted. Such profit may be given as a percentage of cost or percentage of selling price. In order to calculate the amount of profit, it is easy to assume that figure as 100 on which profit percentage is given and then calculate the amount of profit.

Unit Costing NOTES Self-Instructional 172 Material 8.4

SUMMARY ? In order to ascertain the cost of products, a cost sheet is prepared periodically. As the production is uniform and cost units are identical,

the cost per unit is the average

cost. It is ascertained

by dividing the total cost by the number of units produced. ?

Cost sheet is defined

as ‘

a

document which provides for the assembly of the detailed cost of a cost centre or cost unit’. ?

Though the term production statement is used interchangeably with cost sheet, the former is an expanded form of the latter. In addition to cost elements, a production statement includes items of sales, stocks and profits. ?

Scrap may be defined as an unavoidable residue material arising in certain types of manufacturing processes. Examples of scrap are trimmings, turnings or boring from metals or timber, on which operations are performed. ? Scrap usually has a small realizable value. Such realizable value of scrap is deducted from either factory overheads or factory cost while preparing a cost sheet. ? When information shown in a cost sheet

71%

MATCHING BLOCK 43/95

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Cost Accounting, Study Material- new.pdf (D44082039)

is presented in the form of a T- shape account, it is known as production account.

In this account, debit side shows the various item of cost while credit side shows the sales of finished goods. ? Opening stock is written on the debit side while closing stock is written on the credit side. ? Alternatively, closing stock may be shown as a deduction from the items in debit side. In this way this account shows the total cost. The balance in this account shows profit or loss, as the case may be. ? Quite often the management has to quote prices of its products in advance or has to submit tenders for goods to be supplied. For this purpose an estimated cost sheet has to be prepared. Such an estimated cost sheet is prepared to show the estimated cost of products to be manufactured. ? In this cost sheet, cost of direct materials, direct wages and various types of overheads are predetermined on the basis of past costs after taking into account the present conditions and also the anticipated changes in the future price level. ? Overheads are absorbed on the basis of a suitable method of absorption like percentage of direct materials, or wages or machine hour rate, etc. ? After the total cost has been estimated, a desired percentage of profit is added to arrive at the price to be quoted. Such profit may be given as a percentage of cost or percentage of selling price.

Unit Costing NOTES Self-Instructional Material 173 ?

In order to calculate the amount of profit, it is easy to assume that figure as 100 on which profit percentage is given and then calculate the amount of profit. 8.5 KEY WORDS ? Output Costing: Output

76%

MATCHING BLOCK 44/95

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costing is a method of cost ascertainment, which is used in those industries

in which production consists of a single product or a few varieties of the same product, like cement industry, steel mills, paper mills and sugar mills. ? Cost Sheet:

Cost sheet

is a periodical statement of cost, designed to show in detail, the various elements of cost of goods produced like prime cost, factory cost,

cost of production and total cost. ? Estimated Cost

Sheet: In estimated cost sheet, a fixed percentage of profit is added in the estimated total cost to arrive at the selling

price to be quoted. 8.6 SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer Questions 1. Write a short note on the treatment of stocks. 2. What items are excluded from the cost sheet? Give relevant examples. Long-Answer

Questions 1. What is unit or output costing? In what industries is it used? 2.

100%

MATCHING BLOCK 45/95

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Cost Accounting, Study Material- new.pdf (D44082039)

What is a cost sheet? Explain the purposes served by it. 3.

The following data relate to the manufacturing of a standard product during the four weeks ending on 31 March 2017:

Raw materials consumed ` 20,000 Direct wages ` 12,000 Machine-hours worked 1,000 hours Machine-hour rate ` 2 per hour Office overhead 20%

on works cost Selling overheads ` 0.40 per unit Units produced 20,000 units Units sold at ` 3 each 18,000 units Prepare a Cost Sheet and show the profit.

Unit Costing NOTES Self-Instructional 174 Material 4.

A factory produces a standard product. The following information is given to you from which

you are required to prepare a 'Cost Sheet'

for the period ended 31 July 2017: Consumable

materials: ` Opening stock 10,000 Purchases 85,000 Closing stock 4,000 Direct wages 20,000 Other direct expenses 10,000 Factory overheads 100%

of direct labour Office overheads 10% of works cost Selling and distribution expenses ` 2

per unit sold Units of finished product: In hand

at the beginning of the period Units 1,000 (value ` 16,000) Produced during the period 10,000 units In hand at the end of the period 2,000 units Also, find out the selling price per unit on the basis that profit mark-up is uniformly made to yield a profit of 20% of the selling price.

There was

no

work-in-progress either at the beginning or at the end

of the

period. 8.7

FURTHER READINGS

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Shillinglow, G. 1982. Managerial Costing Accounting. Homewood: Richard D. Irwin. Morse, W. J. 1978. Cost Accounting.

Massachusetts: Addison-Wesley Publishing Co. Lal, Jawahar. 2003. Cost Accounting. New Delhi: Tata McGraw Hill.

Process Costing NOTES Self-Instructional Material 175 UNIT 9 PROCESS COSTING Structure 9.0 Introduction 9.1

Objectives 9.2 Process Costing: Features and

Process Cost Accounts 9.2.1 Features 9.2.2 Job Costing vs. Process Costing 9.2.3 Process Costing Procedure and

Process Cost Accounts 9.2.4 Important Adjustments including Inter-Process Profits 9.3 Accounting for

Joint and By Products 9.4 Answers to Check Your Progress Questions 9.5 Summary 9.6 Key Words 9.7 Self Assessment

Questions and Exercises 9.8 Further Readings 9.0 INTRODUCTION

Process costing is probably the most widely used method of cost ascertainment.

It is used in mass production industries producing standard products, like steel, sugar and chemicals. In all such industries, goods produced are identical and all factory processes are standardized.

Goods are produced without waiting for any instructions or orders from customers and are put into warehouse for sale.

Raw materials move down the production line through a number of processes in a particular sequence and costs are compiled for each process or department by preparing a separate account for each process.

In this unit, you will learn about the concept of process costing and its important adjustments. In most of the industries in which process costing

is used, two or more products are unavoidably produced from the same process and same raw

materials. These products are produced in natural proportions which cannot be changed at the will of the management.

For example, in an oil refinery, when crude oil is processed, many products are simultaneously produced from the same set of inputs. Examples of these products are petrol, kerosene oil, diesel, grease and lubricating oils. Such products are

known as joint products or by-products. In this unit, you will also study accounting

for joint or by-products.

Process Costing

NOTES Self-Instructional 176 Material 9.1

OBJECTIVES After going through this unit, you will be able to: ? Discuss the features of process costing ?

Compare process and job costing ? Explain the preparation of process cost accounts ? Describe important adjustment of inter-process profits ? Explain accounting for joint products and by products

9.2 PROCESS COSTING: FEATURES AND PROCESS COST ACCOUNTS In this section, you will learn about the features of process costing, its difference from job costing, the procedure to make process cost accounts and some important adjustments.

9.2.1 Features 1. The production is continuous and the final product is the result of a sequence of processes. 2. Costs are accumulated process-wise. 3. The products are standardized and homogeneous. 4. The cost per unit produced is the average cost which is

calculated by dividing the total process cost by the number of units produced. 5.

The finished product of each but last process becomes the raw material for the next process in sequence

and that of the last process is transferred to the finished goods stock. 6.

The sequence of operations or processes is specific and predetermined. 7. Some loss of materials in processes (due to chemical action, evaporation, etc.) is unavoidable. 8. Processing of a raw materials may give rise to the production of several products. These several products produced from the same raw material may be termed as joint products or by-products. 9.2.2

Job Costing

vs. Process Costing

A comparison of process and job costing methods will help in the better understanding of process costing system.

Process Costing NOTES Self-Instructional Material 177

Process costing Job costing 1. Costs are compiled process-wise and cost per unit is the average cost, i.e., the total cost of the process divided by the number of

units produced. 2. Production is of standardized products and cost units are identical. 3.

Production is for stocks. 4. Costs are computed at the end of a specific period. 5.

The cost of one process is transferred to the next process in the sequence. 6.

On account of continuous nature of production, work-in-progress in the beginning and end of the accounting period is a regular feature. 7.

Cost control is comparatively easier. This is because factory processes and products are standardized. 1.

Costs are separately ascertained for each job, which is cost unit. 2. Production is of non-standard items with specifications and instructions from the customers. 3. Production is against orders from customers. 4. Costs are calculated when a job is completed. 5.

Cost of a job is not transferred to another job

but to finished stock account. 6.

There may or may not be work-in-progress in the beginning

and end of the accounting period. 7. Cost control is comparatively

more difficult because each cost unit or job needs individual attention. 9.2.3

Process Costing

Procedure and Process Cost

Accounts The essential stages in process costing procedure are: 1. The factory is

divided into a number of processes and an account is maintained for each process. 2. Each process account is debited with material cost, labour cost, direct expenses and overheads allocated or apportioned to the process. 3.

The output of a process is transferred to the next process in the sequence.

In other words, finished output of one process becomes input of the next process. 4. The finished output of the last process (i.e., the final product) is transferred to the Finished Goods Account.

Illustration 9.1: A product passes through three distinct processes to completion.

These processes are numbered respectively, 1, 2 and 3. During the week ended 31 January, 1,000 units are

produced. The following information is obtained:

Process	Materials	Labour	Direct expenses
Process 1	6,000	5,000	1,000
Process 2	13,000	4,000	200
Process 3	2,000	5,000	1,000

The indirect expenses for the period were ₹ 2,800, apportioned to the processes on the basis of labour cost. Prepare process accounts showing total cost and cost per unit.

Process Costing NOTES Self-Instructional 178 Material

Solution:

Process 1 Account Output: 1,000 units

Particulars	Per unit	Total	Particulars	Per unit	Total
To Materials	6	6,000			

By Output transferred To Labour	5	5,000	to Process 2	13	13,000	To Direct expenses	1	1,000
---------------------------------	---	-------	--------------	----	--------	--------------------	---	-------

Indirect expenses*	1	1,000	13	13,000	13	13,000
--------------------	---	-------	----	--------	----	--------

Indirect expenses as a % of labour = $\frac{2,800}{5,000} \times 100 = 56\%$ (Note: The original text contains a typo in the calculation)

Process 2 Account Output: 1,000 units

Particulars	Per unit	Total	Particulars	Per unit	Total
To Process I (Transfer)	13.00	13,000			

Output transferred To Materials	3.00	3,000	to Process 3	21.00	21,000
---------------------------------	------	-------	--------------	-------	--------

To Labour	4.00	4,000	To Direct expenses	0.20	200	To Indirect expenses	0.80	800	21.00	21,000	21.00	21,000
-----------	------	-------	--------------------	------	-----	----------------------	------	-----	-------	--------	-------	--------

Process 3 Account Output: 1,000 units Particulars Per unit Total Particulars Per unit Total To Process 2 21 21,000

By

Output transferred To Materials	2	2,000	to finished stock	30	30,000	To Labour	5	5,000	To Direct expenses	1	1,000
---------------------------------	---	-------	-------------------	----	--------	-----------	---	-------	--------------------	---	-------

Indirect expenses	1	1,000	30	30,000	30	30,000
-------------------	---	-------	----	--------	----	--------

Finished Stock Account Units To Process 3 1,000 30,000 9.2.4 Important Adjustments including Inter-Process Profits

There are certain accounting adjustments which are peculiar to process costing and accordingly, this section is broadly divided into three sections: (1) Process losses and wastages

Process Costing NOTES Self-Instructional Material 179 (2) Valuation of work-in-progress—Equivalent Production (3) Inter process profits In this section, you will only learn about

inter-process profits in detail. (1)

Process Losses and Wastages In industries which employ process costing, a certain amount of loss occurs at various stages of production.

Such a loss may arise due to chemical reaction, evaporation, inefficiency, etc. It is, therefore, necessary to keep accurate records of both input and output. Where loss occurs at a late stage in manufacture, it is apparent that financial loss is greater. This is because more and more costs are incurred in processes as products move towards completion stage.

Process losses may be classified into (a) normal, and (b) abnormal. Normal Process Loss That amount of loss which cannot be avoided because of the nature of material or process is normal process loss. Such a loss is quite expected under

normal conditions. It is caused by factors, like chemical change, evaporation, withdrawals for tests or sampling and unavoidable spoiled quantities.

Abnormal Process Loss This type of loss consists of loss due to carelessness, machine breakdown, accident, use of defective materials, etc. Thus, it arises due to abnormal factors and represents a loss which is over and above the normal loss. Accounting procedure for normal and abnormal loss differs. Accounting Treatment of Normal Loss It is a fundamental costing principle that the cost of normal losses should be borne by the good production. Normal loss is generally determined as a percentage of input. Sometimes such a loss is due to loss of weight, say, due to evaporation or chemical action. Since such a wastage is not physically present, obviously it cannot have any value. However, when normal loss is physically present in the form of scrap, it may have some value, i.e., it may be sold at some price. Whenever scrapped material has any value, it is credited to the Process Account.

Accounting Treatment of Abnormal Process Loss It has been stated earlier that abnormal loss is due to carelessness, accidents, machine breakdown and other abnormal reasons. Unlike normal loss, abnormal loss is not absorbed by good production, rather it is transferred to Costing Profit and Loss Account. This is because if the cost of abnormal loss were to fall upon the good production, the cost thereof will fluctuate and the information provided

Process Costing NOTES Self-Instructional 180 Material

would be misleading. In order to overcome this and also to disclose the cost of abnormal loss, the following procedure may be adopted: (a) Allow for normal loss in the manner described earlier. (b) After considering normal loss, find out the cost per unit in that process. This is done by the following formula: Cost per unit =

$\frac{\text{Total cost} - \text{Value of normal loss}}{\text{Units introduced} - \text{Normal loss units}}$

(c) Multiply the cost per unit (calculated as above) by the number of units of abnormal loss. This gives the total value of abnormal loss. (d) Credit the relevant Process Account with the quantity and value of abnormal loss. (e) The balance figure in the Process Account is the cost of good units produced in the process. This can also be found by multiplying cost per unit with the number of good units produced. (f) Open 'Abnormal Loss Account' and debit it with the quantity and value of abnormal loss shown in the Process Account. Sale proceeds from abnormal loss are credited to Abnormal Loss Account. Any balance left in this account is net loss and transferred to Costing Profit and Loss Account.

Abnormal Gain or Effectiveness The normal process loss represents the loss that would be expected under normal conditions. It

is an estimated figure. The actual loss may be greater or less than the normal loss. If the actual loss is greater than normal loss, it

is known as abnormal loss. But if actual loss is less than normal loss,

a gain is obtained which is termed as abnormal gain

or effectiveness. The value of abnormal gain is calculated in a manner similar to abnormal loss. It is shown on the debit side of the Process Account and credit side of the Abnormal Gain Account. Like abnormal loss, it is ultimately transferred to Costing Profit and Loss Account.

It should be noted that the method of valuation of abnormal gain is the same as that of abnormal loss.

Illustration 9.2:

A product passes through three processes A, B and C.

The normal wastage of each process is

as follows: Process A – 3 per cent, Process B – 5 per cent, and Process C – 8 per cent.

Wastage of Process A

was sold at 25 p. per unit, that

of

Process B at 50 p. per unit and that of Process C at ` 1 per unit. 10,000

units were issued to Process

A in the beginning of October 2017

at a cost of ` 1

per unit. The other expenses were as follows: Process A Process B Process C

Sundry materials ` 1,000 ` 1,500 ` 500 Labour 5,000 8,000 6,500 Direct expenses 1,050 1,188 2,009

Actual output 9,500 units 9,100 units 8,100

units

Process Costing NOTES Self-Instructional Material 181

Prepare

the Process Accounts, assuming that there were no opening or closing stocks. Also give the Abnormal Wastage

and Abnormal Gain Accounts. Solution: Process A Account Particulars Units `

Particulars Units `

To Units introduced 10,000 10,000 By Normal wastage 300 75 To Sundry materials 1,000 (3% of 10,000) To Labour 5,000

By Abnormal wastage 200 350* To Direct expenses 1,050 By Process B (transfer) 9,500 16,625 10,000 17,050 10,000

17,050 *Value of abnormal wastage = 17,050 – 75 10,000 – 300 units ` ` x 200

units = ` 350

Process B Account Particulars Units`

Particulars Units` To Process A 9,500 16,625 By Normal

wastage 475 238 To Sundry materials 1,500 (5% of 9,500) To Labour 8,000 By

Process C (transfer) 9,100 27,300 To Direct exp. 1,118 To Abnormal gain 75 225* 9,575 27,538 9,575 27,538 *Abnormal

gain = 27,313 238 9,500 475 units ? ?`

units = ` 225

38%

MATCHING BLOCK 46/95

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Process C Account Particulars Units` Particulars Units` To Process B 9,100 27,300 By Normal wastage 728 728

(transfer) 8% of 9,100) To Sundry materials 500 By Abnormal wastage 272 1156* To Labour 6,500 By Finished goods

To Direct expenses 2,009 (transfer) 8,100 34,425 9,100 36,309 9,100 36,309 *Abnormal wastage = 36,309 – 728 9,100 – 728 units` ` × 272 units = ` 1,156

Abnormal Wastage Account Particulars Units` Particulars Units` To Process A 200 350 By Sales

of scrap in To Process B 272 1,156 Process A @ ` 0.25 200 50 Process C @ ` 1 272 272 By Profit and Loss A/c (B/F) 1,184 472 1,506 472 1,506

Process Costing NOTES Self-Instructional 182 Material

82%

MATCHING BLOCK 47/95

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Abnormal Gain Account Particulars Units` Particulars Units` To Normal wastage A/c 75 38 By Process

B 75 225

shortfall in the sale of normal wastage @ ` 0.50 per unit) To Profit & Loss 187 A/c (B.F.) 75 225 75 225 When the Output of a Process is Partly Sold and Partly Transferred to the

93%

MATCHING BLOCK 48/95

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Next Process Sometimes the output of a process may be partly sold and partly transferred to the next process for further processing.

For example, in a textile mill, part of the output of a spinning process may be sold and the remaining output is passed on to the weaving process for further processing. A

94%

MATCHING BLOCK 49/95

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part of the output so sold will contain an element of profit or loss which will be revealed in the Process Account. But when a part of the output is sent to warehouse for sale, it is at cost and does not contain an element of profit or loss.

Illustration 9.3: XYZ Ltd manufactures and sells three chemicals produced by consecutive processes known as X, Y and Z. In each process 2% of the total weight put in is lost and 10% is scrap, which from processes

X and Y realized ` 100 a tonne and from Z ` 200 a tonne. The products of the three processes are dealt with as follows:

X Y Z Sent to warehouse for sale 25% 50% 100% Passed on the next process 75% 50% — The following particulars relate

to the month of May: Materials used (tonnes) 1,000 140 1,348 Cost per tonne of materials (`) 120 200 80 Mfg. expenses

(`) 30,800 25,760 18,100 Prepare an account for each process, showing the cost per tonne of each product. Solution:

Process X Account Particulars Tonnes` Particulars Tonnes` To Materials 1,000 1,20,000 By Loss in weight (@ ` 120) (2%

of 1,000) 20 — To Mfg. exp. 30,800 By Scrap (10% of 1,000) 100 10,000 By Warehouse (25% of 880) 220 35,200 By

Process Y (transfer) 660 1,05,600 1,000 1,50,800 1,000 1,50,800

Process Costing NOTES Self-Instructional Material 183 Working Notes: 1. Transfer to warehouse = 1,50,800 – 10,000 220 tonnes 880 tonnes ? ` ` = ` 35,200.

Similar calculation has been made in Process Y. 2. As the question is silent about the nature of loss, it is presumed that both weight loss and scrap are normal. Process Y Account Particulars Tonnes ` Particulars Tonnes ` To Process X (transfer) 660 1,05,600 By Loss in weight (2% of 800) 16 — To Materials 140 28,000 By Scrap 80 8,000 To Mfg. exp. ___ 25,760 By Warehouse 352 75,680 By Process Z (transfer) 352 75,680 800 1,59,360 800 1,59,360 Process Z Account Particulars Tonnes ` Particulars Tonnes ` To Process Y By Loss in Weight (transfer) 352 75,680 (2% of 1700) 34 — To Materials 1,348 1,07,840 By Scrap 170 34,000 To Mfg. exp. — 18,100 By Warehouse (transfer) 1,496 1,67,620 1,700 2,01,620 1,700 2,01,620 (2)

Work-in-Progress (

Equivalent Production) Process costing mainly deals with continuous type of production. At the end of the accounting period, there may be some work-in-progress, i.e., semi-finished goods may be in the pipeline. The valuation of such work-in-progress is done in terms of equivalent or effective production. Equivalent Production

Equivalent production represents

the production of a process in terms of completed units.

Work-in-progress at the end of an accounting period are converted into equivalent completed units. This is done by the following formula:

Equivalent Completed No. of units of Degree of = + × production

units work in progress completion in % ? ? ? ? ? ? ? ?

100%

MATCHING BLOCK 50/95

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Cost Accounting, Study Material- new.pdf (D44082039)

For example, if there are 50 units in work-in-progress and these are estimated to be 60% complete, then their equivalent production is 50 units × 60% = 30 units.

In each process, an estimate is made of the degree of completion of work- in-progress in terms of percentage. Such an estimate must be accurate because any error in such estimation will lead to erroneous valuation of work-in-progress stock which enters into final accounts.

Process Costing NOTES Self-Instructional 184 Material

Evaluation of Equivalent Production After work-in-progress has been converted into equivalent completed units, the following steps are taken to evaluate it: (i) Find out the total cost (net) for each element of cost, i.e., material, labour and overheads. Scrap value of normal loss is deducted from the material cost. (ii) Ascertain the cost per unit of equivalent production separately for each element of cost. This is done by dividing the total cost of each element by the respective number of equivalent units. (iii) At this rate of cost per unit, ascertain the value of finished production and work-in-progress. For the purpose of computation of equivalent production and its evaluation, the following three statements are generally prepared: (

a) Statement of equivalent production (b) Statement of cost (per unit) (c) Statement of

evaluation These three statements may also be combined in one comprehensive statement called 'Statement of Production, Cost and Evaluation.' For clear understanding, treatment on equivalent production are classified into the following two categories. (a) When there is no opening stock, i.e., when there is only closing stock of work-in-progress. In such a situation there may or may not be process losses. (b) When there is opening as well as closing stock—Here also, there may or may not be process losses.

When there is no opening stock

of work-in-progress but there are process losses—as discussed earlier, losses are inherent in process operations. Normal and abnormal process losses are treated differently in the calculation of equivalent production. Normal Loss—Equivalent units of normal loss are taken as nil. In other words, normal loss is not added in the equivalent production. However, realizable value of normal scrap is deducted from the cost of material so as to calculate the net material cost. This net material cost becomes the basis of calculating the material cost per unit in the statement of cost. Abnormal Loss—This is treated as if this were good production lost. Abnormal loss, thus, is added to equivalent production with due consideration to its degree of completion. Unless the degree of completion is specified, it may be assumed that abnormal loss units are 100% complete in respect of all elements of cost.

Process Costing NOTES Self-Instructional Material 185

Abnormal Gain—Units of abnormal gain are represented by good finished production. It is therefore, always taken as 100% complete in respect of all elements of cost, i.e., material, labour and overheads. Abnormal gain

is deducted to obtain equivalent production. When there is opening as well as closing

stock of work-in-progress In such a case there

are two methods of calculating equivalent production: (i) FIFO Method, and (ii) Average Cost Method. These methods have been discussed in detail, further. FIFO (

First-in, First out)

Method This method is based on the assumption that work-in-progress moves on

a first- in-first out basis. This means that unfinished work on the

opening stock is completed first, before work on any new units is taken up. Thus no units from opening work- in-progress will be left incomplete

and none of these find a place in the closing work-in-progress. In other words, closing stock will be calculated out of the materials introduced during the current period and will be valued at the current cost. The costs incurred during the

current period will be distributed over opening stock of work-in-progress (for its completion), units introduced and completed during the period and closing stock of work-in-progress. This is done by dividing the costs incurred by the

relevant equivalent production so as to arrive at the per unit cost of equivalent production. FIFO method gives

satisfactory results when prices of materials, rates of wages and overheads are relatively stable. Computation of

Equivalent Production under FIFO Method. The following steps are taken in the computation of equivalent production: (i)

State the opening stock of work-in-progress in equivalent completed units. This is done by applying the percentage of work needed to complete the unfinished work of the previous period. For example, if there are 200 units of opening

work-in-progress which are 70% complete, then the equivalent units of this will be $200 \times 30\%$ (work required to

complete the incomplete portion) = 60 units. (ii) Ascertain the number of units introduced into the process and deduct the number of units of closing work-in-progress. This gives the number of units started and completed during the

period. Add these units to the opening stock of work-in-progress calculated in (i) above. (iii) Add to the above the

equivalent completed unit of closing work-in-progress. This can be determined by applying the percentage of work

done on the finished units at the end of the period.

Process Costing NOTES Self-Instructional 186 Material

Average Cost Method In this method, the cost of opening work-in-progress is not kept separately but is averaged with the additional costs incurred during the period. This method

thus combines the cost of opening work-in-progress and new production. Information relating to degree of completion of opening WIP is not required. In order to find out the cost per unit of equivalent production, the cost of each element

(material, labour and overheads) applicable to the opening work-in- progress is added to the cost incurred in the current period for that element. A single cumulative total and unit cost is obtained. Units completed and transferred as well as

closing work-in-progress will be valued at this average unit cost.

FIFO Method vs Average Cost Method Both FIFO and average methods have certain advantages and it cannot be said that one method is either simpler or more accurate than the other. The main difference between these two methods is

regarding the treatment of the opening stock-in- progress. In FIFO method, opening stock of work-in-progress is kept as a separate figure. Costs incurred to complete this opening work-in-progress are added to the opening work-in-progress

cost and the sum of these two costs is the total cost of completed units of opening work-in-progress at which it is

transferred to the next process. The units which are introduced in the process and finished during the same period have

their own cost per unit which may be different from the completed cost per unit of opening work-in-progress. In

average cost method, on the other hand,

the cost of opening work-in- progress is added to

material, labour and overhead costs incurred during the period. The cost per unit is computed by dividing the total of these costs by equivalent units. How to choose between FIFO and Average Method Both FIFO and Average methods

have advantages and disadvantages. If one were to choose between these methods in an examination question, the

following rules may be followed: 1. Use FIFO – If the cost of the opening work-in-progress in one lump sum figure and the stage of completion is given. For Example: Given: Opening work-in-progress 1,000 units Cost ` 18,000 Stage of

completion: Materials 100% Labour 60% Overheads 60% 2. Use Average – If the cost of opening work-in-progress is

given in terms of materials, labour and overhead but the stage of completion is not given. For example:

Process Costing NOTES Self-Instructional Material 187

Given: Opening work-in-progress 1,000 units Cost—Materials ` 10,000 Labour ` 4,000 Overheads ` 4,000 3. FIFO or Average—Your Choice— If the degree of completion and the cost in terms of materials, labour and overheads of the opening work-in- progress are given, then one has a choice between FIFO and Average methods. For example: Given: Opening work-in-progress 1,000 units Degree of completion and cost: Material (100% Complete) ` 10,000 Labour (60% Complete) ` 4,000 Overhead (60% Complete) ` 4,000 4. Where the question specifies a method to be followed, then that method must be followed.

Illustration 9.4: The following information relates to Process X for May 2017:

Opening work-in-progress 200 units Introduced during the month 1,600 units Completed during the month 1,480 units Closing work-in-progress 320 units

Degree of Completion Material Labour Overheads Opening work-in-progress 100% 50% 50% Closing work-in-progress 100% 25% 25% Costs: ` ` ` Opening work-in-progress 2,400 320 3,210 Costs incurred during the period 19,200 6,368 6,368 Assuming materials were introduced in the beginning of the process and labour and overhead were incurred uniformly throughout the process, prepare process account using: (a) FIFO Method (b) Average Method

Process Costing NOTES Self-Instructional 188 Material Solution: (a) FIFO Method (i) Statement of Production * Units introduced and completed during the month = Units completed – Units of opening W.I.P = 1,480 – 200 = 1,280 units. (ii) Statement of Cost Cost element ` Equivalent units

Cost per unit (`) (A) (B) (A ÷ B) Material 19,200 1,600 12.00 Labour 6,368 1,460 4.36 Overheads 6,368 1,460 4.36 Total 20.72 (iii)

Statement of Evaluation Particulars Elements of Equivalent

Per unit Cost Total cost units ` ` cost Opening WIP Material — — — — Labour 100 4.36 436 Overheads 100 4.36 436 872 Finished Production Material 1,280 12.00 15,360 Labour 1,280 4.36 5,583 Overheads 1,280 4.36 5,583 26,526 Closing WIP Material 320 12.00 3,840 Labour 80 4.36 349 Overheads 80 4.36 349 4,538

Process A Account Particulars Units `

Particulars Units ` To

Opening WIP 200 3040

By Completed production (2,400 + 320 + 320) (3,040 + 872 + 26,526) 1,480 30,438 To Material 1,600 19,200 By Closing WIP 320 4,538 To Labour 6,368 To Overheads 6,368 1,800 34,976 1,800 34,976

Process Costing NOTES Self-Instructional Material 189 (b) Average Method (i) Statement of Production (ii) Statement of Cost Equivalent Cost per Opening W.I.P. + Cost incurred = Total

units

unit ` ` ` `

Material 2,400 + 19,200 = 21,600 ÷ 1,800 = 12.00 Labour 320 + 6,368 = 6,688 ÷ 1,560 = 4.29 Overheads 320 + 6,368 = 6,688 ÷ 1,560 = 4.29 Total 20.58 (iii) Statement of Evaluation Particulars Element of Equivalent Per unit Cost Total cost units ` ` cost ` Finished units

Material 1,480 12.00 17,760 Labour 1,480 4.29 6,345 Overheads 1,480 4.29 6,345 30,450 Closing WIP Material 320 12.00 3,840 Labour 80 4.29 343 Overheads 80 4.29 343 4,526 Process Account Particulars Units `

Particulars Units `

To Opening

WIP 200 3,040 By Finished output 1,480 30,450 To Material 1,600 19,200 To Labour — 6,368 By Closing WIP 320 4,526 To Overheads — 6,368 1,800 34,976 1,800 34,976 (3)

Internal

Process Profits In some businesses, it is a practice to charge

the output of each process to the next process not

at cost but at

a price showing profit to the transferor process. The transfer price may be

either the current market price or cost plus a fixed percentage. Thus each process is charged with its input at current price and no process obtains the benefits of saving or has to bear the losses caused by the efficiency or inefficiency of the earlier processes. In brief,

the objects of such internal process profit are: (a) To show whether the cost in each process competes with the market prices.

Process Costing NOTES Self-Instructional 190 Material (

b)

To make each process stand on its own efficiency and economy. (

c) To assist in making decisions, such as to buy a partly-processed material rather than to process work internally or to sell a partly-processed product or to process it further.

Internal process profits have the disadvantage of complicating the costing records. The complications brought into the accounts arise from the fact that inter-process profit, so introduced, remains included in the price of process stocks, finished stocks and work-in-progress. For balance sheet purposes, such stocks have to be reduced to actual cost because a firm cannot make profits by trading with itself. The inclusion of inter-process profits should be best avoided unless the benefits outweigh the added complications. However, the object of internal process profits can also be achieved by making separate cost analysis and reports outside the costing records or by adopting a standard costing system where standard should be set for each process. The procedure involved in inter-process profits is demonstrated in the following illustration. Illustration 9.5: A Ltd produces product 'AXE' which passes through two processes before it is completed and transferred to finished stock. The following data relate to October 2010: Processes Finished Stock Particulars I II Opening stock `7500 `9000 `22,500 Direct materials 15,000 15,750 – Direct wages 11,200 11,250 – Factory overheads 10,500 4,500 – Closing Stock 3,700 4,500 11,250 Inter-process profit included in opening stock 1,500 8,250 Output of

Process I is transferred to Process II at 25% profit on the transfer price. Output of Process II is transferred to finished stock at 20% profit on the transfer price.

Stocks in processes are valued at prime cost. Finished stock is valued at the price at which it is received from Process II. Sales during the period is `1,40,000.

Process Costing NOTES Self-Instructional Material 191 Required: Process Cost Accounts and Finished Stock Account showing the profit element at each stage. (CA Inter) Solution: Process I Account Cost Profit Total Cost Profit Total ` ` ` ` ` ` To Opening By Process II 40,500 13,500 54,000 stock 7,500 – 7,500 To Direct material 15,000 – 15,000 To Direct wages 11,200 – 11,200 33,700 33,700 Less: Closing stock 3,700 3,700 30,000 – 30,000 To Factory overheads 10,500 – 10,500 40,500 – 40,500 To Profit – 13,500 13,500 40,500 13,500 54,000 40,500 13,500 54,000 Process II Account

Cost Profit Total Cost Profit Total ` ` ` ` ` ` To Opening By Finished stock 7,500 1,500 9,000 stock a/c 75,750 36,750 1,12,500 To Process I 40,500 13,500 54,000 To Direct material 15,750 – 15,750 To Direct wages 11,250 – 11,250 75,000 15,000 90,000 Less: Closing stock 3,750 750 4,500 71,250 14,250 85,500 To Factory overheads 4,500 – 4,500 75,750 14,250 90,000 To Profit – 22,500 22,500 75,750 36,750 1,12,500 75,750 36,750 1,12,500

Process Costing NOTES Self-Instructional 192 Material Finished Stock Account Cost Profit Total Cost Profit Total ` ` ` ` ` ` To Opening By Sales 82,500 57,500 1,40,000 stock 14,250 8,250 22,500 To Process II 75,750 36,750 1,12,500 90,000 45,000 1,35,000 Less: Closing stock 7,500 3,750 11,250 82,500 41,250 1,23,750 To Profit – 16,250 16,250 82,500 57,500 1,40,000 82,500 57,500 1,40,000

Working Notes: 1. Reserve for unrealized profit in closing stock Process I: Nil Process II: Cost of stock = Cost 75,000 Closing stock = 4,500 = 3,750 Total 90,000 ? ? ` Profit = Total – Cost = 4,500 – 3,750 = `750

Finished Stock Cost of stock = Cost Closing stock Total ? = 90,000 11,250 7,500 1,35,000 ? ? ` Profit = Total – Cost = 11,250 – 7,500 = `3,750 2. Profit for the month ` ` Process I: 13,500 Process II: 22,500 Add: Unrealized profit in opening stock 1,500 24,000 Less: Unrealized profit in closing stock 750 23,250 Finished stock 16,250 Add: Unrealized profit in opening stock 8,250 24,500 Less: Unrealized profit in closing stock 3,750 20,750 Total profit 57,500 Check Your Progress 1.

How is the finished output of the last process treated? 2. What is normal process loss? 3. State the disadvantage of internal process profits.

Process Costing NOTES Self-Instructional Material 193 9.3 ACCOUNTING FOR JOINT AND BY PRODUCTS The term joint products is used for two or more products of almost equal economic value, which are simultaneously produced from the same manufacturing process and the same raw material. Joint products thus represent two or more products separated in the course of processing, each product being in such proportion and of such economic significance that no single one of them can be regarded as the main product. Characteristics of joint products are: (a) Joint products are produced from the same raw material in natural

proportions (b) They are produced simultaneously by a common process (c) They are comparatively of almost equal value (d) Joint products may be saleable after separation or may be further processed by incurring additional costs to make them saleable or an improved product A classic example of joint products, as given above, is found in oil refining, where items like petrol, diesel, naphtha and kerosene are produced from the crude oil. Other examples are in flour mill, where joint products are white flour, brown flour, animal feeding stuff; in meat canning where joint products are hides, canned meat, fertilizers, etc. The term joint product is also used to describe various qualities of the same product, as for example, many grades of coal which may be produced in coal mining.

Accounting for Joint Products Accounting for joint products means the apportionment of joint cost to each of the joint product. Such apportionment serves the following objectives: (a) To determine the cost per unit of products (b) To help in inventory valuation (c) To determine the profit or loss on each line of product (d) To determine the price of each product The various methods of apportionment of joint costs (discussed below) are based mainly on individual opinion and tend to produce only approximate results. This is because no perfectly logical basis exists for the apportionment of joint costs to products and most of the methods are arbitrary. Therefore, while selecting a particular methods it should be kept in mind that the method should be logical, appropriate and reliable and should be consistently followed.

Following are the main methods of apportionment of joint costs over joint products:

Process Costing NOTES Self-Instructional 194 Material 1.

Sales Value Method: Under this method, joint costs are apportioned to various joint products on the basis of sales value of each such product.

The sale value method has the following variants: (a) On the basis of unit prices: In this method, the selling prices per unit of various joint products is taken as the basis for apportionment of joint costs. In other words, joint cost is apportioned to various joint products in the ratio of selling prices of individual joint products without any regard to the quantities. It is thus suitable when the number of units of production of all the products are equal. It is illustrated below with assumed figures. Example: Joint cost ` 9,000 Products Selling price Apportioned cost per unit (Ratio 12 : 8 : 4) ` ` A 12 4,500 B 8 3,000 C 4 1,500 Joint cost ` 9,000 (b) On the basis of sales value: In this method, the apportionment is done on the basis of weighted sales value, i.e., number of units produced and sold × selling price per unit. This method thus gives due consideration to the quantities of various joint products produced. The difference between the method based on unit selling prices discussed earlier and this method is that while the former gives no consideration to the quantities of joint products produced, the latter gives due importance to the quantities. This method will give satisfactory results even when number of units of different joint products are widely different. The method is illustrated below with assumed figures: Example: Joint cost ` 9,000 Products Selling price Production quantities Sales value Apportioned per unit units (a) × (b) joint cost (24 : 48 : 28) (a) (b) (c) (d) ` ` ` ` A 12 200 2,400 2,160 B 8 600 4,800 4,320 C 4 700 2,800 2,520 Total 10,000 9,000 2.

Reverse Cost Method (Net realisable value method): In this method, the joint cost is apportioned on the basis of net value of each product. The net realisable value is calculated by deducting the following from the sales value. (a) Estimated profit margin (b) Selling and distribution costs, if any (c) After split off processing costs

Process Costing NOTES Self-Instructional Material 195

The net realisable values of individual products so obtained are taken as the basis for apportioning joint costs. This is known as reverse cost method because net realisable values are calculated by working backwards from sales values. This method is particularly used when products are not sold at their stage at split off point but require further processing. Operation of this method is illustrated below. Illustration 9.6: In processing a basic raw material, three joint products 'X', 'Y' and 'Z' are produced.

The joint expenses of manufacturing are: Materials ` 10,000; Labour ` 8,000; Overheads ` 9,000 (Total ` 27,000).

Subsequent expenses are as follows: X Y Z ` ` `

Material 2,000 1,600 1,800 Labour 2,500 1,400 1,700 Overheads 2,500 1,000 1,500 Total 7,000 4,000 5,000 Sales Value 42,000 20,000 18,000 Estimated profit on sales 50% 50% 33 1/3%

Show

how you would apportion the joint costs of manufacture

by Reverse Cost Method. Solution: Statement of

Apportionment of Joint Costs X Y Z ` ` ` Sales value 42,000 20,000 18,000 Less: Estimated profit on sales 21,000 10,000 6,000

Estimate total cost 21,000 10,000 12,000 Less: Subsequent costs (total) 7,000 4,000 5,000 Joint costs (` 27,000) apportioned 14,000 6,000 7,000 3.

Physical Units

Method: Under this method, the joint cost is apportioned on the basis of relative weight, volume or quantity, etc., of each product,

obtained at the point where the split-off occurs. For the method to be suitable, the unit of measurement should be applicable for all products, e.g., usually gases, liquids and solids cannot be taken together. However, where joint products cannot be measured by the same measurement unit,

the joint products must be converted to a denominator common to all the

units produced. For instance in the manufacture of coke, products such as coke, coal tar, benzol, sulphate of ammonia, gas, etc., are measured in different units. The yield of these recovered units is measured on the basis of quantity of product extracted per tonne of coal.

This is illustrated

as follows:

Process Costing NOTES Self-Instructional 196 Material

Illustration 9.7: The following data have been extracted from the books of

Coke Co. Ltd: Joint products Yield (in lbs) of recovered products per tonne of coal
 Coke 1,420 Coal tar 120 Benzol 22 Sulphate of ammonia 26 Gas 412
 2,000 The price of coal is ₹ 80 per tonne. The direct labour and overhead costs to the point of split-off are ₹ 40 and ₹ 60, respectively, per tonne of coal. Calculate the material, labour and total cost of each product on the basis of weight. Solution: Statement of Apportionment of Joint Cost

Product	Yield (lbs)	Yield % of Coal	Direct Labour	Overheads	Total
Coke	1,420	71.0	56.80	28.40	42.60
Coal tar	120	6.0	4.80	2.40	3.60
Benzol	22	1.1	0.88	0.44	0.66
Sulphate of ammonia	26	1.3	1.04	0.52	0.78
Gas	412	20.6	16.48	8.24	12.36
Total	2,000	100	80.00	40.00	180.00

Average Unit Cost Method: In this method, the joint cost is apportioned by using the average unit cost which is obtained

by dividing the total joint cost by the total number of units produced

of

all

the products. The average cost per unit of each product is the same.

The procedure is illustrated as follows. Illustration 9.8: From the following particulars,

find out

the cost of joint products A, B and C under the average unit cost method. (

a) Pre-separation point cost ₹ 30,000 (b) Other production data: Product Units produced X 1,000 Y 400 Z 600 2,000

Process Costing NOTES Self-Instructional Material 197 Solution:

joint cost 30,000 Average unit cost = 15 per unit Total no. of units produced 2,000 units ? ? ?

Statement of Apportionment of Joint Cost

Product	Units produced	Average cost	Apportioned cost (A) × (B)
X	1,000	15	15,000
Y	400	15	6,000
Z	600	15	9,000
Total	2,000	30,000	5.

Survey Method: This method apportions the joint cost to various products, on the basis of the results of a survey or technical evaluation. In this survey, various factors, like volume, selling price, marketing process, etc., are studied and points or weights are assigned to each product. Costs are apportioned on the basis of such weights or points. Illustration 9.9:

X, Y and Z are the three joint products in a factory. Their joint cost is ₹ 30,000. Quantities produced are as follows: X 1,000 Y 400 Z 600 On the basis of technical evaluation, points allotted to X, Y and Z products are 3.2, 5 and 8 per unit, respectively. Apportion the joint cost. Solution: Statement of Apportionment of Joint Cost

Product	Units produced	Points	Weighted *Cost per Apportioned produced assigned units weighted cost unit (32 : 20 : 48)
(a) X	1,000	3.2	3,200
(b) Y	400	5.0	2,000
(c) Z	600	8.0	4,800
Total	10,000	3.00	30,000 *

Joint cost 30,000 3 per unit. Total no. of weighted units 10,000 ? ? ?

Process Costing NOTES Self-Instructional 198 Material

By-Products By-products are products of relatively small value which are incidentally and unavoidably produced in the course of manufacturing

the main product. For example, in sugar mills, the main product is sugar.

But bagasse and molasses of comparatively smaller value are incidentally produced and thus are by-products. Other examples of by-products are oil cake produced in the extraction of edible oil; cotton seed produced in cotton textile industry, etc. These by-products are unavoidably produced and are of secondary value. The sales value of these by-products is much less as compared to the main product. For example, sales value of by-products bagasse and molasses is much less than that of

the main product sugar. By-products may be: (a) Those sold in their original form without further processing (b) Those which require further processing in order to be saleable

Examples of By-products Industry By-products 1. Sugar Bagasse, Molasses 2. Cotton textile Cotton seed 3. Edible oil Oil cake 4. Meat Bones 5. Rice mills Husk Distinction

between Joint Products and By-products Distinction

between Joint Products and By-products

There are

no hard and fast rules to distinguish between joint products and by-products. A product may be treated as a joint product in one business and the same product may be treated as a by-product in another business. However, the following factors should be considered to determine if a product is a joint product or a by-

product. (a) Relative sales value: If the sales value of all the products are more or less equal, they are treated as joint products. If, however, there are wide differences in the relative sales values of products, the product with the greater sales value is treated as the main product and the products of lower value are treated as by-products. (b) Objective of manufacture: If the objective of manufacturing is product A, then unwanted products B and C be treated as by-products. (c) Policy of management: The management may decide to treat a particular product as the main product and the other products as by-products.

Alternatively, it may choose to treat all products as joint products.

Process Costing NOTES Self-Instructional Material 199

By-products, Scrap and Waste By-products should not be confused with waste or scrap. Waste is used to describe a material which has no value or even negative value, if it has to be disposed of at some cost. Examples of waste are gases, smoke and other unsaleable residues from the manufacturing process. Scrap is also different from by-products in the sense that it is the leftover part of the raw materials whereas by-products are different from the material which went into the production process. Small pieces of wood left in furniture manufacture or metal sheet pieces left in utensil manufacture are examples of scrap, whereas minor chemicals, having some value, emerging from a chemical process are classified as by-products. Sale value of scrap is relatively less than that of by-products. However accounting treatment for scrap and by-products is quite similar.

Accounting for By-products Various methods of

accounting for by-products are as follows: 1. Where by-products are of small total value: In such a case it is not considered practicable to apportion any part of the joint cost to by-products. The net income realized by the sale of by-products

may be treated in any one of the following two ways: (i) It may be treated as 'miscellaneous income' and credited to the Costing Profit and Loss Account. (ii) It may be credited to the process account in which the by-product has arisen.

In determining the net income from by-products, the following should be deducted from the sales value of by-products:

(i) any selling and distribution expenses incurred in the sale of by-products; and (ii) any costs incurred in further processing of by-products to make them saleable. 2. Where by-products are of considerable total value: Where by-products are of considerable sales value, it is proper to apportion a part of the joint cost to by-products. Such apportioned cost of by-products is debited to by-product account and credited to the main product account or the relevant process account. Any cost incurred in further processing of the by-product is debited to by-product account. The by-product account is credited with its sales value and any profit/loss arising out of this account is transferred to costing Profit and Loss Account.

The apportionment of joint cost to by-products can be done by any of the four methods discussed earlier in costing of joint products. These methods are: (i) Sales value method; (ii) Physical units method; (iii) Average cost method; and (iv) Points value or survey method. 3.

Where by-products require further processing: In such situations, the share of by-product in joint-cost at the split-off point may be arrived at by subtracting the profit and the further processing cost from the realizable value of the products,

Process Costing NOTES Self-Instructional 200 Material i.

e., by using Reverse Cost Method. In case the cost of the by-products at the split-off point is small or negligible, it may be treated as per the method (a) discussed above. On the contrary, if it is of considerable amount, it is treated as per method (b)

discussed above, i.e., joint cost is apportioned to by-products. Illustration 9.10: Product Z yields two by-products A and B. The joint cost of manufacture is ₹ 65,800. From the following information, show how would you apportion the joint cost of manufacture: Z A B (i) Sales ₹ 1,00,000 40,000 25,000 (ii) Manufacturing costs after separation ₹ 5,000 4,000 (iii) Estimated selling expenses on sales 20% 20% (iv) Estimated profit on sales 25% 30% Solution: Statement of Cost of By-products—A and B

	A	B
Sales	40,000	25,000
Less: Profit	10,000	7,500
	30,000	17,500
Less: After separation costs	5,000	4,000
Selling expenses	8,000	5,000
Share in joint cost	17,000	8,500

Statement of Cost of Product Z
 Total joint cost ₹ 65,800
 Less: Joint cost apportioned to A ₹ 17,000 B ₹ 8,500
 Cost of Product Z ₹ 40,300

Process Costing NOTES Self-Instructional Material 201

Decision regarding Further Processing of Joint and By-products Apportionment of joint costs is not relevant in decision making regarding further processing of joint or by-products. Whenever management has to take a decision whether or not to further process a joint product or by-product after split-off, decision will be taken by comparing the incremental revenue after split-off point with the incremental cost after split-off point. So long as the incremental revenue is more than the incremental cost on further processing of a joint or a by-product, it is profitable to further process the product, not otherwise. Illustration 9.11: A company produces two joint products P and Q, their cost upto separation point being ₹ 47,000. These products can be sold at the split-off point at ₹ 150 and ₹ 350 per unit, respectively. Alternatively, the two products can be further processed at a cost of ₹ 15,000 and ₹ 12,000, respectively. After further processing these can be sold at ₹ 320 and ₹ 500 per unit, respectively. The output of P is 150 units and of Q is 60 units. Advise whether these products should be sold at split-off point or these should be processed further. Solution: Statement Showing Incremental Profit/Loss

	Product P	Product Q
Output	150 units	60 units
Incremental revenue from further processing	(₹ 320 – ₹ 150) × 150 units = ₹ 25,500	(₹ 500 – ₹ 350) × 60 units = ₹ 9,000
Less: Incremental cost	15,000	12,000
Incremental Profit/loss	(–) 10,500	(–) 3,000

Conclusion: Product P should be processed further because it gives an incremental profit of ₹ 10,500 whereas product Q should be sold at split-off point because it results in incremental loss of ₹ 3,000.

Check Your Progress 4. Give examples of joint costs. 5. What is the reason behind the name reverse cost method? 9.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS 1.

The

finished output of the last process that is the final product is transferred to the finished goods account.

Process Costing NOTES Self-Instructional 202 Material 2.

That amount of loss which cannot be avoided because of the nature of material or process is normal process loss. Such a loss is quite expected under normal conditions. 3.

Internal

process profits have the disadvantage of complicating the costing records. The complications brought into the accounts arise from the fact that inter-process profit, so introduced, remains included in the price of process stocks. 4. Some examples of joint costs are raw material, labour and overheads. 5. The reverse cost method is named so because net realizable values are calculated by working backwards from sales values. 9.5

SUMMARY ?

Process costing is the most widely used method of cost ascertainment.

It is used in mass production industries producing standard products, like steel, sugar and chemicals. ? In all such industries, goods produced are identical and all factory processes are standardized.

Goods are produced without waiting for any instructions or orders from customers and are put into warehouse for sale. ?

In industries which employ

process costing, a certain amount of loss occurs at various stages of production.

Such a loss may arise due to chemical reaction, evaporation, inefficiency, etc. It is, therefore, necessary to keep accurate records of both input and output. Where loss occurs at a late stage in manufacture, it is apparent that financial loss is greater. ?

There are certain accounting adjustments which are peculiar to process costing:

process losses and wastages, equivalent production and inter-process profits. ?

In some businesses, it is a practice to charge

the output of each process to the next process not

at cost but at

a price showing profit to the transferor process. The transfer price may be either the current market price or cost plus a fixed percentage. Thus each process is charged with its input at current price and no process obtains the benefits of saving or has to bear the losses caused by the efficiency or inefficiency of the earlier processes. ?

The term joint products is used for two or more products of almost equal economic value, which are simultaneously produced from the same manufacturing process and the same raw material. ?

The various methods of apportionment of joint costs are based mainly on individual opinion and tend to produce only approximate results. This is because no perfectly logical basis exists for the apportionment of joint costs to products and most of the methods are arbitrary. Therefore, while selecting

Process Costing NOTES Self-Instructional Material 203

a particular method

it should be kept in mind that the method should be logical, appropriate and reliable and should be consistently followed. ?

By-products should not be confused with waste or scrap. Waste is used to describe a material which has no value or even negative value, if it has to be disposed of at some cost. Examples of waste are gases, smoke and other unsaleable residues from the manufacturing process. 9.6 KEY WORDS ?

Process Costing: Process costing is the methodology used to allocate the total costs of production to homogenous units produced via a continuous process that usually involves multiple steps or departments ?

Joint

Products:

Joint products are multiple products generated by a single production process at the same time. ?

By-Products: It refers to

products of relatively small value which are incidentally and unavoidably produced in the course of manufacturing the main product 9.7

SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer Questions 1.

State the essential characteristics of process costing. 2.

How are normal and abnormal losses treated in the calculation of equivalent production? 3.

State the

characteristics of joint products. 4. Differentiate between joint products and by-products. 5. What is the difference between by-products, scrap and waste? 6. Write a short note on the inter process profits. Long Answer Questions 1.

Describe the different methods of accounting for joint products. 2. Explain accounting for by-products. 3.

A

product passes through two processes.

The output of Process I becomes the input of Process II and

the output of Process II is transferred to warehouse. The quantity of raw materials introduced into Process I is 20,000 kgs at ` 10 per kg. The cost and output data for the month under review are as under:

Process

Costing NOTES Self-Instructional 204 Material

Process I Process II Direct materials ` 60,000 ` 40,000 Direct labour ` 40,000 ` 30,000 Production overheads ` 39,000 `

40,250 Normal loss 8% 5% Output ` 18,000 ` 17,400 Loss realization of $\frac{1}{2}$ /unit 2.00 3.00 The company's policy is to fix the selling price of the end product in such a way as to yield a profit of 20% on selling price. Required: (i) Prepare the

Process Accounts (ii) Determine the selling price per unit of the end

product. 4.

A

coke

manufacturing company produces the following products by putting 5,000 tonnes of coal @ 25 per tonne

into common process:

Coke 3,500

tonnes Tar 1,200 tonnes Sulphate 52 tonnes Benzol 48 tonnes Apportion the joint cost amongst the products on the basis of physical units method. 9.8

FURTHER READINGS

Arora, M.N. 2012. A Textbook of Cost and Management Accounting, Tenth edition. New Delhi: Vikas Publishing House.

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Shillinglow, G. 1982. Managerial Costing Accounting. Homewood: Richard D. Irwin. Morse, W. J. 1978. Cost Accounting.

Massachusetts: Addison-Wesley Publishing Co. Lal, Jawahar. 2003. Cost Accounting. New Delhi: Tata McGraw Hill.

Contract Costing:

Types and Procedure NOTES Self-Instructional Material 205

BLOCK - III BILL MARKET

UNIT 10 CONTRACT COSTING: TYPES AND PROCEDURE Structure 10.0 Introduction 10.1 Objectives 10.2 Procedure for Contract Costing 10.3 Types of Contract Costing 10.3.1 Profit from Incomplete Contract 10.3.2 Escalation Clause 10.3.3 Cost-plus

Costing 10.4 Answers to Check Your Progress Questions 10.5 Summary 10.6 Key Words 10.7 Self Assessment Questions and Exercises 10.8 Further Readings 10.0 INTRODUCTION

You have already learnt in Unit 7 that contract costing is a sub-type of job costing. Herein accounts for each and every contract is opened separately since each contract is considered to be a cost unit. This type of costing has several benefits. It helps the managers ascertain cost per contract, the total cost of contracts as well as the profit made over every contract. There is also no delay in the work being completed. The managers have a control over the performance of the contract and there are minimal chances of incurring losses. In this unit, you will learn the procedure of contract costing and

will further learn about the different types of contract costing. 10.1 OBJECTIVES After going through this unit, you will be able to: ? Discuss the procedure for contract costing ? Explain special points related to contract costing ? Describe the types of contract costing

Contract Costing: Types and Procedure NOTES Self-Instructional 206 Material 10.2 PROCEDURE FOR CONTRACT COSTING The basic procedure for costing of contracts is as follows: 1. Contract account: Each contract is allotted a distinct number and a separate account is opened for each contract. 2. Direct costs: Most of the costs of a contract can be allocated direct by to the contract. All such direct costs are debited to the contract account. Direct costs for contracts include: (i) Materials; (ii) Labour and supervision; (iii) Direct expenses; (iv) Depreciation of plant and machinery; (v) Sub- contract costs, etc. 3. Indirect costs: Contract account is also debited with overheads which tend to be small in relation to direct costs. Such costs are often absorbed on some arbitrary basis as a percentage on prime cost, or materials, or wages, etc. Overheads are normally restricted to head office and storage costs. 4. Transfer of materials or plant: When materials, plant or other items are transferred from the contract, the contract account is credited by that amount. 5. Contract price: The contract account is also credited with the contract price. However, when a contract is not complete at the end of the financial year, the contract account is credited with the value of work-in-progress as on that date. 6. Profit or loss on contract:

The balance of contract account

represents profit or loss which is transferred to Profit and Loss Account.

However, when contract is not completed within the financial year, only a part of the profit arrived is taken into account and the remaining profit is kept as reserve to meet any contingent loss on the incomplete portion of the contract. This is discussed in detail later in this unit. Special Points in Contract Costing Some of the important points to be considered in contract costing are now discussed:

Cost of Materials Materials include: (i) materials specifically purchased for the contract; (ii) materials issued from store against material requisition notes. The cost of both these types of materials is debited to the contract account. Materials Returned to Store:Whenever materials are issued in excess of requirements, for instance, cement, sand, pipes and bricks, these are later returned to the store accompanied by a Material Return Note which gives the details of the materials returned. Such returned materials are credited to contract account. Materials at Site:At the end of each accounting period, value of materials lying unused at site is credited to contract account and is carried forward for charging against the next period.

Contract Costing: Types and Procedure NOTES Self-Instructional Material 207 Cost of Labour All wages of workers engaged on a particular contract are charged direct to the contract, irrespective of the type of work they perform.

When several contracts are running at different locations, payroll is normally sectionalized so as to have separate payroll for each contract. Difficulties in costing may be encountered when some workers may have to move from one site to another if a number of small contracts are under- taken. In such situations, it becomes necessary to provide time sheets from which allocations can be made. In order to control labour utilization and prevent fraud in the payment of wages, surprise visits by head-office personnel will be necessary. Plant There are two different methods of dealing with depreciation of plant in contract account: (a)

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Contract account is debited with the cost of the plant

installed. When the contract is completed or the plant is no longer required, the plant is revalued and contract account is credited with this revalued or depreciated figure. In case plant is sold on the completion of the contract, the contract account is credited with its sale proceeds. The net effect of the above debit and credit will be that the contract account will stand debited with the amount of depreciation, which is the difference between the value of plant debited and value of plant credited. The method is generally used on long contracts which extend over more than one year because depreciated value of the plant is credited to the contract account and brought down as an opening balance in the next period. (b) Alternatively, contract account is simply debited with the amount of depreciation. It is usual to use this method when plant is sent to contract only for a short period. For example, mobile crane or bulldozer used in a contract may be charged on this basis. However, when a plant is hired for a contract, a charge for the hire of the plant is debited to the contract as a direct expense.

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Sub-contracts Work of specialized character, for which facilities are not internally available, is

offered to a sub-contractor.

For example, steel work, glass work, painting, etc., is usually carried out by the sub-contractors who are accountable to the

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main contractor. The cost of such work is charged to the contract account.

Payment based on Architect's Certificate In case the contract is small, full payment is usually made

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on the completion of the contract. But in case of large contracts, it may take more than one year

to complete. In such a case, if no payment is received until the completion of the contract, the financial resources of the contractor could surely become strained. Therefore, a system of progress payments is followed. In this system, part payments of the contract amount are paid from time to time on the basis of certificate issued by the Contract Costing: Types and Procedure NOTES Self-Instructional 208 Material architects (acting for the contractee), certifying the value of the work satisfactorily completed. Such payments received by the contractor are usually credited to the personal account of the contractee. It should be noted that such payments are not entered in the Contract Account. Work Certified and

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Work Uncertified When the contract is not completed till the end of the accounting year, the

architect is required to value the work-in-progress. Such work-in-progress is

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classified into work certified and work uncertified. Work Certified: This is that part of the work-in-progress which has been approved by the contractee's architect

or
engineer

for payment. Work certified is valued at contract price (i.e., selling price), and includes an element of profit. Work Uncertified: This is that part of the work-in-progress which is not approved by the architect or engineer. This

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is valued at cost and thus does not include an element of profit.

Both work certified and uncertified appear on the credit side of the contract account and also on the assets side of the balance sheet. Retention Money and Cash Ratio It is a usual practice not to pay the full amount of work certified. The contractee may pay a fixed percentage, say 80%

or 90% of the work certified, depending upon the terms of the contract.

This is known as Cash Ratio. The balance amount not paid is known as Retention Money. For example, if cash ratio is 75%, the retention money will be the remaining 25%. This retention money is a type of security for any defective work which may be found in the contract later on. This also works as a deterrent for the contractor to leave the contract incomplete, if he finds the contract unprofitable. The retention money may also be adjusted against penalties that become due if the contract is not completed within the stipulated time as per the terms of the agreement. Extra Work Sometimes the contractor is required to do some extra work like

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additions or alterations in the work originally done as per agreement. The contractor

will charge extra money

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for such extra work. The cost of such extra work is debited to

the contract account and extra price realized is credited to the contract account. Check Your Progress 1. How are direct costs treated in contract accounts? 2. What is work uncertified? 10.3 TYPES OF CONTRACT COSTING In this section, you will study the different types of contracts and in essence types of contract costing.

Contract Costing: Types and Procedure NOTES Self-Instructional Material 209 10.3.1 Profit from Incomplete Contract Contracts which are started and finished during the same financial year create no accounting problems. But in case of those contracts which take more than one year to complete, a problem arises whether profit on such contracts should be worked out only on the completion of the contract or at the end of each financial year on the partly completed work. If profit is computed only on the completion of the contract, profit will be high in the year of completion of the contract, whereas in other years of working on contract, profit will be nil. This would result not only in distorted profit pattern but also higher tax liability because income tax at higher rates may have to be paid. Therefore, when contracts extend beyond a year, it becomes necessary to take into account the profit earned (or loss incurred) on the work performed during each year. This helps in avoiding distortion of the year-to-year profit trend of the business. There are two aspects of profit computation: (a) Computation of notional profit or estimated profit. (b) Computation of the portion of such profit that is

to be transferred to Profit and Loss Account. Notional Profit

Notional profit is

the difference between the value of work-in-progress certified and

the cost of work-in-progress certified. It is computed as follows (Figures are assumed):

Value of work certified 20,00,000 Add: Cost of work not yet certified 1,50,000 21,50,000

Less: Cost of work to date 19,00,000

Notional Profit 2,50,000 If in any year, cost of work done exceeds the value of work certified and uncertified, the result will be a notional loss. Estimated Profit

Estimated profit represents the excess of the contract price over the estimated total cost of the contract.

It is computed as follows (Figures are assumed): Contract Price 30,00,000 Less: Total cost already incurred 21,00,000 9,00,000 Less: Estimated additional costs to complete the contract 3,50,000 Estimated Profit 5,50,000

Portion of Notional Profit or Estimated Profit to be Transferred to Profit and Loss Account The

portion of the notional or estimated profit to be transferred to P&L Account depends upon the stage of completion of the contract, i.e., ratio of work-in-progress

Contract Costing: Types and Procedure NOTES Self-Instructional 210 Material

certified to total contract work. For this purpose work-in-progress uncertified is not considered. Prudence requires that the total notional profit should not be transferred to P&L Account but a portion of it should be withheld as a reserve to meet any unforeseen future expenses or contingencies. Rules: There are no hard and fast rules in this regard. However, the following general rules may be followed in this context. 1.

When

work certified is less than 1/4 of the contract price, no profit is transferred to Profit

and Loss Account. This is based on the principle that no profit should be taken into account unless the contract has advanced reasonably. 2. When work-in-progress

certified is 1/4 or more but less than 1/2 of the contract price, then generally 1/3 of the profit

is transferred to Profit and Loss Account. The balance amount is treated as reserve.

Thus,

profit to be transferred to Profit and Loss Account is computed by the

following formula: Transfer to P&L A/c = Notional Profit \times $\frac{1}{3}$ Alternatively, a more common practice is to further reduce this amount by the cash ratio. Thus: Transfer

to P&L A/c = Notional profit \times $\frac{1}{3} \times$

Cash received Work certified 3.

When

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work certified is 1/2 or more but less than 9/10 of the contract price, (i.e. 50% to 90%), then the profit to be transferred to

P & L Account is computed as follows: Transfer to P&L A/c = Notional Profit \times $\frac{2}{3}$ Here also a more common practice is to further reduce this amount by cash ratio. This is shown below: Transfer to P&L A/c = Notional Profit \times $\frac{2}{3} \times$ Cash received Work certified 4.

When contract is near completion, then the estimated profit should be calculated on the whole contract.

The proportion of estimated profit to be transferred to Profit and Loss Account is computed by

any one of the following formulas: (

a) Estimated profit \times

Work certified Contract price (b)

Estimated profit \times Work certified Contract price \times Cash received Work certified (

c) Estimated profit \times Cost of work to date Estimated total cost of work (d) Estimated profit \times Cost of work to date

Estimated total cost of work \times Cash received Work certified

Contract Costing: Types and Procedure NOTES Self-Instructional Material 211 5.

Loss on Uncompleted Contracts: In the event of a loss on uncompleted contracts, this should be transferred in full to the Profit and Loss Account, whatever be the stage of completion of the contract. It was stated earlier also that these are not hard and fast rules. The practice may vary from firm-to-firm depending upon the nature of work involved, degree of risk in the business, extent of work completed, etc. But whatever method is adopted, it should be applied consistently from year-to-year so as not to disturb the trend of profits. Illustration 10.1:

Raja

Construction Ltd took a contract in 2018 for road construction. The contract price was `10,00,000 and its estimated cost of completion would

be `9,20,000. At the end of 2018, the company has received `3,60,000, representing 90% of the work certified. Work not yet certified

had a cost of `10,000.

Expenditure incurred on the contract during 2018 was as follows: Materials `50,000, Labour `3,00,000, Plant `20,000.

Materials costing `5,000 were damaged and had to be disposed

of for `1,000. Plant is considered as having depreciated by 25 per cent. (i)

Prepare Contract Account for 2018

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in the books of Raja Construction Ltd. (ii) Show all possible figures that can be reasonably credited to Profit and Loss Account

in respect of the contract.

Solution: (i) Contract

A/c for the year 2018

To Materials 50,000 By Materials damaged 5,000 To Labour 3,00,000 By Plant at site 15,000 To Plant 20,000 By Work-in-progress: To Profit (Notional) 60,000 Work certified 4,00,000* Work uncertified 10,000 4,30,000 4,30,000 *

Working Note: Work certified = $\text{`3,60,000} \div 90\% = \text{`4,00,000}$. (ii) Amount of profit that may be taken to Profit and Loss

Account: The contract price is `10,00,000 The work certified is `4,00,000 , i.e., 40% of contract price. Method I – $\frac{1}{3}$ of the notional profit may be transferred to Profit and Loss Account = $60,000 \times \frac{1}{3} = \text{`20,000}$ Method II – The amount calculated, as above, may be reduced on cash basis: i.e., Notional profit $\times \frac{1}{3} \times \text{cash ratio} = 60,000 \times \frac{1}{3} \times 90\% = \text{`18,000}$

Contract Costing: Types and Procedure NOTES Self-Instructional 212 Material Method III – The estimated profit is `80,000 , i.e., $\text{`10,00,000} - 9,20,000$

Profit to be transferred to Profit and Loss Account may be calculated on the basis of estimated profit: = Estimated profit \times

Work certified $\frac{\text{Contract price}}{\text{Contract price}} = \frac{80,000 \times 4,00,000}{10,00,000} = \text{`32,000}$

Method IV – Profit calculated in method III may be further reduced by cash ratio as follows: $80,000 \times \frac{4,00,000}{10,00,000} \times 90 = \text{`28,800}$ 10.3.2

Escalation Clause This clause is often provided in contracts to cover

any likely changes in the price or utilization of materials and labour.

Thus, a contractor is entitled to suitably enhance the contract price if the cost rises beyond a given percentage.

The object

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of this clause is to safeguard the interest of the contractor

against unfavourable changes in cost. The escalation

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clause is of particular importance where prices of material and labour are anticipated to increase or where quantity of material

and/ or labour time cannot be accurately estimated. Just as an escalation clause safeguards the interest of the contractor by upward revision of the contract price, a de-escalation clause may be inserted to look after the interest of the contractee by providing for downward revision of the contract price in the event of cost going down beyond an agreed level. 10.3.3

Cost-plus

Costing

Cost-plus contract is a contract in which the price is

not fixed at the time of entering into the contract.

The contract price is determined by adding a specified amount or percentage of profit to the costs allowed in the contract.

The contractee compensates the contractor for all allowable costs actually incurred by him. Over and above these costs the contractor is paid a fixed amount or a fixed percentage of cost as profit. The items of cost to be included for the purpose of determining contract price are broadly agreed upon in advance. The accounts of the contractor are usually subject to audit by the contractee.

Cost-plus contracts are usually entered into for executing special types of work, like construction of dam, power house, newly designed ship, etc., where accurate cost estimation is difficult. Government often prefers to give contracts on 'cost-plus' terms. Advantages: Cost-plus contracts offer the following advantages: To the Contractor: 1. There is no risk of loss being incurred on such contracts. 2. It protects him from the risk of fluctuations in market prices of material, labour, etc. 3. It simplifies the work of preparing tenders and quotations.

Contract Costing: Types and Procedure NOTES Self-Instructional Material 213

To the Contractee: The contractee can ensure a fair price of the contract by being entitled to audit the accounts of the contractor. Disadvantages The disadvantages of cost-plus contracts are: To the Contractor: 1. The contractor is deprived of the advantages which would have accrued due to favourable market prices. 2.

The contractor has to suffer for his own efficiency. This is because profit is usually based as a percentage of cost and efficient working resulting in lower cost also leads to lower profits. To the Contractee: 1. The contractee has to pay more for the inefficiency of the contractor as the contractor has no incentive to reduce costs. 2. The price the contractee has to pay is unknown until after the completion of work.

Example: The following are

the particulars relating to a contract which has begun on 1 January 2018:

Contract

price 5,00,000 Machinery 30,000 Materials 1,70,600 Wages 1,48,750 Direct expenses 6,330 Outstanding wages 5,380

Uncertified work 9,000 Overheads 8,240 Materials

returned 1,600 Materials on hand 31 December 2017 3,700 Machinery on hand 31 December 2017 22,000 Value of work certified 3,90,000 Cash received 3,51,000 Prepare the Contract Account for the year 2018 showing the amount of profit that may

be taken to the credit of Profit and Loss A/c

of the year. Also show the amount of

the work-in-progress as it would

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appear in the balance sheet of the year. Solution: Contract Account for the year ending 31

December 2018 To Materials 1,70,600 By Materials returned 1,600 To Wages 1,48,750

By Materials on hand 3,700 Add: Outstanding 5,380 1,54,130 By Work-in-progress: To Direct expenses 6,330 Certified 3,90,000 To Overheads 8,240 Uncertified 9,000 3,99,000

To

Depreciation on machinery 8,000 To Notional Profit c/d 57,000 4,04,300 4,04,300 By Notional Profit b/d 57,000

Contract Costing: Types and Procedure NOTES Self-Instructional 214 Material To P&L A/c* 34,200 2 3,51,000 57,000 3 3,90,000 ? ? ? ? ? ? ? ? To Balance c/d (Reserve) 22,800 57,000 57,000 *Notes: Work certified is 3,90,000 which is 78% of contract price of 5,00,000.

Thus transfer to P&L A/c is by the following formula: Notional profit $\times \frac{2}{3} \times$

Cash

received Work certified

Balance Sheet as on 31 December 2018 Liabilities Assets Outstanding wages 5,380 Materials on hand 3,700

Machinery on hand 22,000 Work-in-progress: Work certified 3,90,000 Work uncertified 9,000 3,99,000 Less: Cash

received 3,51,000 48,000 Less: Profit in reserve 22,800 25,200 Target Costing Cost is an important justification for

determining the selling price. In a traditional 'cost-plus' price method, the selling price of a product is set on the basis of total cost plus desired profit. This sounds logical because a company must cover all costs and earn a profit. But it must be accepted that in a competitive market, a company has little influence over the selling price of its product. Thus a cost plus price may not be acceptable in the market and if it is so then cost-plus pricing approach will prove a recipe for market failure. This view is based on the ground that it is not for the customer to ensure a profit to the manufacturer. In the words of Peter E Drucker, 'Customers do not see it as their job to ensure manufacturer a profit. The only sound way to price is to start out with what the market is willing to pay.' In fact, the price of a product has to be on the basis of what the market is willing to pay. Target costing is a method of determining the cost of a product or service on the basis of competitive price prevailing in the market. In this technique, it is the market price that determines, the cost of a product and not the cost that determines the selling price. Target costing is defined as 'a cost management tool for determining and realizing a total

cost at which a proposed product with specified functionality must be produced to generate

the desired profitability at its anticipated selling price in the future.' It is important that the cost and the price are for the specified product functionality which can be understood from the needs for the customer and his willingness to pay for each function. Target cost is an allowable cost for the product or service, given a competitive price, so that the company can earn the desired profit margin.

Contract Costing: Types and Procedure NOTES Self-Instructional Material 215 Thus: Target cost = Competitive market price – Required profit In simple words, target costing involves setting a target cost by subtracting the desired profit margin from the competitive market price. For example, if a manufacturer has target a profit of ` 25,000 on a new product by producing and selling 50,000 units at a price of ` 4 per unit, Sales 50,000 units @ ` 4 ` 2,00,000 Desired profit ` 25,000 Target cost ` 1,75,000 The target cost is determined by working from the market price of product to the cost that will allow a company to earn a target profit. In order to reduce cost to a target cost level, companies have to: (a) redesign the product or service (b) use advanced cost management techniques to seek higher productivity (c) use new and advanced technology in the manufacture of goods and services. Target Costing Process The basic steps in target costing are: define, set, achieve and maintain: 1. Define the product, i.e., to analyse the product and its functions, identify the customers, study competitive position, etc. 2. Set the target, i.e., to study how much the customer will pay and what should be the cost of the product. 3. Achieve the target to make value analysis and cost analysis to achieve the target cost. 4. Maintain competitive cost i.e., not only to achieve the target cost but to stay ahead of competitors by using cost reduction methodology on a continuous basis. Check Your Progress 3. How is the loss on uncompleted contracts treated? 4.

State the object of the escalation clause. 10.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS 1.

Direct costs are debited to the contract account. 2. Work uncertified is that part of the work-in-progress which is not approved by the architect or engineer. This

100%

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is valued at cost and thus does not include an element of profit.

Contract Costing: Types and Procedure NOTES Self-Instructional 216 Material 3.

In the event of a loss on uncompleted contracts, this should be transferred in full to the Profit and Loss Account, whatever be the stage of completion of

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Cost Accounting, Study Material- new.pdf (D44082039)

the contract. 4. The object of the escalation clause is to safeguard the interest of the contractor

against unfavourable changes in cost 10.5 SUMMARY ?

Contract costing also known as terminal costing is a variant of job costing in which each contract is a cost unit and an account is opened for each contract in the books of the contractor to ascertain profit/loss thereon. ?

The Contract costing procedure includes: preparation of a contract account, allocation of direct and indirect costs, transfer of materials or plant, crediting of the contract price and the determination of profit or loss on contract. ?

Materials of contracting costing in contract costing can be either materials returned to store or materials at site. ?

Progress payments are part payments of the contract amount which are paid from time to time on the basis of certificate issued by the architects, certifying the value of the work satisfactorily completed. ? When contracts extend beyond a year, it becomes necessary to take into account the profits earned (or loss incurred) on the work performed during each year. This helps in avoiding distortion of the year-to-year profit trend of the business. ? Escalation clause is a clause often provided in contracts to cover

any likely changes in the price or utilization of materials and labour. ?

Cost-plus contract is a contract in which the price is

not fixed at the time of entering into the contract. 10.6 KEY WORDS ? Contract costing: It

is a variant of job costing in which each contract is a cost unit and an account is opened for each contract in the books of the contractor to ascertain profit/loss thereon ?

Escalation clause: It is a clause which is often provided in contracts to cover

any likely changes in the price or utilization of materials and labour ?

Cost-plus contract: It refers to a contract in which the price is not fixed at the time of entering into the contract

Contract Costing: Types and Procedure NOTES Self-Instructional Material 217 10.7

SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer Questions 1. How are direct and indirect costs treated in the contract costing procedure? 2. Briefly state the methods of ascertaining profit on the following contracts: (a) When contract is completed (b) When contract is not completed (c) When the contract is nearing completion Long Answer Questions 1. Distinguish between job costing and contract costing. State the special features of contract costing. 2.

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What is a cost-plus contract? Discuss this from the point of view of (a)

the manufacturer, (b) the buyer. 3. Explain how the profits are determined in the case of uncompleted contracts. 4.

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Thekedar accepted a contract for the construction of a building for ₹ 10,00,000; the contractee agreeing to pay 90% of work certified as complete by the architect. During the first year, the amounts spent were: Material ₹ 1,20,000 Machinery ₹ 30,000 Labour ₹ 1,50,000 Other expenses ₹ 90,000 At the end of the year, the machinery was

considered to be of ₹ 20,000,

87%

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Cost Accounting, Study Material- new.pdf (D44082039)

and materials at site were of the value of ₹ 5000. Work certified during the year totalled ₹ 4,00,000. In addition, work-in-progress but not certified at the end of year had cost ₹ 15,000. Prepare Contract Account in the books of Thekedar. Also show the various figures of profit that can be transferred reasonably to the Profit and Loss Account 10.8

FURTHER READINGS

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Operating Costing NOTES Self-Instructional 218 Material UNIT 11 OPERATING COSTING Structure 11.0 Introduction 11.1 Objectives 11.2

Meaning and Features of Operating Costing 11.2.1 Cost Unit 11.3 Transport Costing and Operating

Cost Sheet 11.4 Answers to Check Your Progress Questions 11.5 Summary 11.6 Key Words 11.7 Self Assessment Questions and Exercises 11.8 Further Readings 11.0 INTRODUCTION

Not all organization are involved in the process of manufacturing tangible products, many undertake the delivery of services. For such organizations, operating costing is used. It measures the cost per unit of service rendered. Since this is not a tangible product or item, technical and statistical expertise is required in this type of costing. Operating costing has several benefits including assistance in setting of, control and management of costs, prevention of unnecessary costs, comparison of costs, check of probability between different service centres, etc. In this unit, you will learn about the meaning and features of operating costing, the concept of cost unit and

the procedure related to transport costing. 11.1 OBJECTIVES After going through this unit, you will be able to: ? Discuss the meaning and features of operating costing ? Explain the concept of

cost unit ? Describe the features and procedure of transport costing ? Explain the preparation of operating cost sheet

11.2 MEANING AND FEATURES OF

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Cost Accounting, Study Material- new.pdf (D44082039)

OPERATING COSTING Operating costing is a method of cost ascertainment used in those undertakings which are engaged in

providing services, such as transport, electricity, etc. These undertakings do not manufacture tangible products.

Operating Costing NOTES Self-Instructional Material 219 The cost of providing a service is termed as 'operating cost'. In many manufacturing companies, operating costing is used in certain departments which render services, within the organization, e.g., internal transport and personnel department. Operating costing is also known as service costing.

According to CIMA London, Operating costing is

88%

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Cost Accounting, Study Material- new.pdf (D44082039)

that form of operation costing which applies where standardized services are rendered either by an under-taking or by a service cost centre within an undertaking. Operating costing

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Cost Accounting, Study Material- new.pdf (D44082039)

should not be confused with operation costing. While operating costing is

applied to determine the cost of providing a service,

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Cost Accounting, Study Material- new.pdf (D44082039)

operation costing is a refinement and more detailed application of process costing. Operating Costing

is applicable in: ? Road transport companies ? Railways ? Airways ? Shipping companies ? Electricity companies ? Water supply companies ? Gas supply companies ? Hospitals and nursing homes ? Cinemas ? Canteens and hotels ? Computer Centres ? Schools and colleges ? Local Authority ? Power house in a factory Features

The following characteristics are usually found in industries where operating costing is used: (

a) Services rendered to customers are of unique and standardized type. (b)

A large proportion of the total

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Cost Accounting, Study Material- new.pdf (D44082039)

capital is invested in fixed assets and comparatively less working capital is required. (

c) The distinction between fixed cost and variable cost is of particular importance. This is because the economics and scale of operations considerably affect the cost per unit of service rendered. For example, fixed cost like insurance per passenger will be lower if buses in transport company run capacity packed.

Operating Costing NOTES Self-Instructional 220 Material 11.2.1 Cost Unit The selection of a suitable cost unit (unit of service) is very important. The cost units may be of the following two types: (1) Simple cost unit: A few examples are given below: Undertaking Cost unit 1. Transport Per kilometre or per mile 2. Water works Per 1,000 litres 3. Municipality Per km of road maintained 4. Canteen Per meal or per dish (2) Composite cost unit: In service undertakings, generally a composite cost unit is used. In this type, two units are rolled into one. For example, in a transport company, weight of goods as well as distance covered should be taken into account in evolving a cost unit, i.e., a tonne-kilometre, which means 1 tonne of goods transported to 1 km. Other examples are:

Undertaking Cost unit 1. Transport Per passenger-km or Per tonne-km 2. Hospital Per bed per day 3.

Hotel Per room per day 4. Cinema Per seat per show (or per man show) 5. Electricity Per kilowatt hour (kWh) 11.3

TRANSPORT COSTING AND OPERATING COST SHEET There are various undertakings in which operating costing is used. For instance, transport costing, canteen costing, boiler house and power house costing, etc. In this section, you will only study the transport costing, its procedure and the preparation of operating sheet. Objectives: The main objectives of transport costing are: 1.

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Cost Accounting, Study Material- new.pdf (D44082039)

To fix the rates of carriage of goods or passengers on the basis of operating costs. 2. To

decide the hire charges where vehicles are given on hire. 3. To determine

what should be charged to departments or others

using the service. 4. To compare the cost of using own motor vehicles and that of using alternate forms of transport.

Operating Costing NOTES Self-Instructional Material 221 5.

and so variable cost per unit may be computed straightaway. Wages of drivers, conductors and cleaners are sometimes regarded as variable costs if payment is made according to distance or trips. These two types of costs are compiled periodically in an operating cost sheet.

Illustration 11.2: From the following data relating to two different vehicles A and B, compute the cost per running mile: Vehicle A Vehicle B Mileage run (annual) ` 15,000 ` 6,000 Cost of vehicle ` 25,000 ` 15,000 Operating Costing NOTES Self-Instructional Material 223 Road licence (annual) ` 750 ` 750 Insurance (annual) ` 700 ` 400 Garage rent (annual) ` 600 ` 500 Supervision and salaries ` 1,200 ` 1,200 Driver's wages per hour ` 3 ` 3 Cost of fuel per gallon ` 3 ` 3 Miles run per gallon 20 miles 15 miles Repairs and maintenance per mile ` 1.65 ` 2.00 Tyre allocation per mile ` 0.80 ` 0.60 Estimated life of vehicles 1,00,000 miles 75,000 miles Charge interest at 5% per annum

on cost of vehicles. The vehicles run 20 miles per hour on an average. (ICWA Inter) Solution: Operating Cost Sheet for the year ending..... No. of cost units A: 15,000 B: 6,000 Cost unit: One mile Particulars Vehicle A Vehicle B ` ` Fixed cost per annum: Road licence 750 750 Insurance 700 400 Garage rent 600 500 Supervisory salaries 1,200 1,200 Interest 5% on cost of vehicle 1,250 750 Total 4,500 3,600 Fixed cost per mile (A) 0.30 0.60 Variable cost per mile: Driver's wages (` 3 per hour for 20 miles) 0.15 0.15 Fuel cost per mile 0.15 0.20 Repairs and maintenance 1.65 2.00 Tyre allocation 0.80 0.60 Depreciation (cost ÷ estimated life) 0.25 0.20 Variable cost per mile (B) 3.00 3.15 Total Cost Per Running Mile (A + B) 3.30 3.75 Price Quotations Transport companies may have to quote prices for specific trips on contract basis or mileage basis. The method of preparing price quotations is similar to that as explained in earlier unit on Output or Unit Costing, i.e., price quotation is usually based on cost plus desired profit. A Statement of Quotation is thus prepared to determine the Quotation Price as shown in the following Illustration.

Operating Costing NOTES Self-Instructional 224 Material Illustration 11.3:

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Cost Accounting, Study Material- new.pdf (D44082039)

Union Transport Company supplies the following details in respect of a truck of 5-tonne capacity: Cost of truck ` 90,000 Estimated life 10 years Diesel, oil, grease ` 15 per trip each way Repairs and maintenance ` 500 per month Cleaner's wages ` 250 per month Driver's wages ` 500 per month Insurance ` 4,800 per year Tax ` 2,400 per year General supervision charges ` 4,800 per year The truck carries goods to and from city covering a distance of 50 miles each way.

While going to the city,

96%

MATCHING BLOCK 84/95

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freight is available to the extent of full capacity and on return 20% of capacity. Assuming that the truck runs on an average 25 days a month, work out: (i) Operating cost per tonne-

mile, and (ii) Rate

78%

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per trip that the company should charge if profit of 50% on freightage is to be earned.

Solution: (

i) Operating Cost Statement for the month ending..... Tonne-miles = 7,500* Per month Per tonne-mile ` ` 1. Fixed Costs Driver's wage 500 Cleaner's wage 250 Insurance 400 Taxes 200 General supervision 400 1,750 0.233 2. Running (or Variable) Costs Diesel, oil, etc. (15 × 2 × 25) 750 Repairs and maintenance 500 Depreciation 1 1 90,000 10 12 ? ? ? ? ? ? ? 750 2,000 0.267 Total 3,750 0.500 *Note:Tonne-miles are computed as under: [(50 × 5) + (50 × 1)] × 25 days = 7,500 tonne-miles (ii) Calculation of Freight Rate and Quotation Cost per tonne-mile ` 0.50 Profit per tonne-mile (50% on freightage is 100% on cost) ` 0.50

Operating Costing NOTES Self-Instructional Material 225 Freight rate per tonne-mile ` 1.00 Freight rate per trip both ways = ` 1 × 300 tonne-miles = ` 300. Note: In one trip (both ways) there are 300 tonne-miles, i.e., (50 × 5) + (50 × 1) = 300. Check Your Progress 1. State the difference between operating and operation costing. 2. Give examples of composite cost unit. 3. Name the way of computing composite cost unit in which

84%

MATCHING BLOCK 86/95

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the trip is considered as a whole and is arrived at by multiplying the total distance in kms by average load quantity. 11.4

ANSWERS TO CHECK YOUR PROGRESS QUESTIONS 1.

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Cost Accounting, Study Material- new.pdf (D44082039)

Operating costing should not be confused with operation costing. While operating costing is

applied to determine the cost of providing a service,

89%

MATCHING BLOCK 88/95

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Cost Accounting, Study Material- new.pdf (D44082039)

operation costing is a refinement and more detailed application of process costing. 2. Examples of

composite cost unit includes: per passenger-km, per bed per day, per seat per show, per kilowatt hour, etc. 3. It is in commercial tonne-km in which the trip is considered as a

91%

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whole and it is arrived at by multiplying the total distance in kms by average load quantity. 11.5

SUMMARY ?

Operating

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Cost Accounting, Study Material- new.pdf (D44082039)

costing is a method of cost ascertainment used in those undertaking which are engaged in

providing services, such as transport, electricity, etc. ? The cost of providing a service is termed as 'operating cost'. In many manufacturing companies, operating costing is used in certain departments which render services, within the organizations, e.g., internal transport and personnel department. Operating costing is also known as service costing. ? Operating costing is applicable in: road transport companies, railways, airways, gas supply companies, cinemas, canteens and hotels, etc. ? The selection of a suitable cost unit is very important. The cost units may be of the following types: (i) simple cost unit and (ii) composite cost unit. ? The cost unit in passenger transport is usually a passenger kilometer and in goods transport it is a tonne-kilometre.

Operating Costing NOTES Self-Instructional 226 Material ? In transport costing,

84%

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Cost Accounting, Study Material- new.pdf (D44082039)

composite cost units may be computed in two ways: (a) Absolute tonne-km

and (b) Commercial tonne-km. ? Most of the details required for

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Cost Accounting, Study Material- new.pdf (D44082039)

transport costing are obtained from log sheet. A log sheet is maintained for each vehicle to record details of trips, running time,

capacity, mileage, etc., on daily basis. 11.6

KEY WORDS ?

Operating Costing: It

is a method of cost ascertainment used in those undertaking which

are engaged in providing services, such as transport, electricity, etc. ? Log Sheet: In transport costing,

70%

MATCHING BLOCK 93/95

SA Cost Accounting, Study Material- new.pdf (D44082039)

a log sheet is maintained for each vehicle to record details of trips, running time,

capacity, mileage, etc., on daily basis. 11.7 SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer Questions 1. List some of the industries in which operating costing is applicable. 2. What are the features of operating costing? 3. Write a short note on cost unit. 4. What are the objectives of transport costing? 5. Briefly explain the preparation of log sheet. Long Answer Questions 1. Explain the transport costing procedure with an example. 2. During one week, a lorry carries a load of 29 tonnes and the distance covered is 409 kilometres as below: Kilometres Tonnes carried Monday 85 6 Tuesday 70 5 Wednesday 80 5 Thursday 64 6 Friday 76 4 Saturday 34 3 409 29 Assuming your own figures, calculate the cost per tonne-kilometre

Operating Costing

NOTES Self-Instructional Material 227 11.8 FURTHER READINGS

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Batch Costing NOTES Self-Instructional 228 Material UNIT 12 BATCH COSTING Structure 12.0 Introduction 12.1

Objectives 12.2 Meaning and Applicability of Batch Costing 12.2.1 Economic Batch Quantity (EBQ) 12.3 Answers to Check Your Progress Questions 12.4 Summary 12.5 Key Words 12.6 Self Assessment Questions and Exercises 12.7 Further

Readings 12.0 INTRODUCTION

Batch costing is a sub-type of job costing. It is used in industries where homogeneous products are manufactured in large quantities. As the name suggests, batch costing is related to the cost ascertainment of a batch of goods. These are products whose cost per units cannot be ascertainment in isolation. Examples of such products include cakes, biscuits, nuts, bolts, screws, etc. There are several factors which are used for such cost accumulation and ascertainment including the flow of work, operation factors, capacity of machines, treatment of work-in-progress, etc. The production planning through economic batch quantity helps in ascertaining the optimum batch quantity to be produced. In this unit, you will study the meaning and applicability of batch costing, the batch

costing procedure and the concept of economic batch quantity. 12.1

OBJECTIVES After going through this unit, you will be able to: ? Discuss the meaning of batch costing ?

List the

industries in which batch costing is used ? Explain the batch costing procedure ? Describe the concept of economic batch quantity 12.2 MEANING AND APPLICABILITY OF

BATCH COSTING

Batch costing is a variation of job costing.

While job costing is concerned with costing of jobs that are made to a customer's particular requirements, batch costing

Batch Costing NOTES Self-Instructional Material 229

is used when production consists of limited repetitive work and a definite number of articles are manufactured in each batch to be held in stock for sale to customers generally.

Thus, a batch is a cost unit consisting of a group of identical items.

Application of

Batch Costing

Batch costing is applied in the manufacture of shoes, toys, readymade garments, component parts of say, cars, radios, watches, etc. In shoe industry, for example, it is just not economical to manufacture a pair of shoes to meet the requirements of one customer. On the other hand, batches of say 500

to 5,000 shoes of each size, style, colour, etc., are economically made and held in stock for sale on demand. ? Shoe manufacture ? Toys ? Readymade garments ? Tyres and tubes ? Component parts, etc. Batch Costing Procedure Each batch is given a batch number in exactly the same way as a job is given a job number.

Direct materials, direct labour and direct expenses which can be identified with

the batch are recorded on the Batch Cost Card. The costing of materials requisitions and time sheets follows normal job costing principles. Overheads are absorbed on one of the bases already explained as is done in job costing. When a batch is completed,

the total cost of the batch is divided by the quantity produced in the batch to arrive at the cost per unit

or per dozen etc., as required. Often, a major cost in producing a batch is the cost of setting up jigs and tools. This is of the nature of fixed cost and is spread over the total number of articles in the batch. So the larger the batch size, the lower is the setting up cost per article. Illustration 12.1: Component 89-X is made entirely in cost centre 75. Material cost is 6 paise per component and each component takes 10 minutes to produce. The machine operator is paid 72 paise per hour, and the machine hour rate is ₹ 1.50. The setting up of the machine to produce component 89-X takes 2 hours 20 minutes. On the basis of this information, prepare a comparative cost sheet showing the production and setting up cost, both in total and per component assuming a batch of (a) 10 components, (b) 100 components and (c) 1,000 components, is produced. (CA Inter)

Batch Costing NOTES Self-Instructional 230 Material

Solution: Comparative Cost Sheet Component 89-X Particulars Batch size in components 10 100 1,000

Particulars	10	100	1,000
Setting-up Cost	1.68	5.18	5.18
Labour—2 hrs 20 mts at 72 paise per hour	1.20	12.00	120.00
Overheads—2 hrs 20 mts at ₹ 1.50 per machine hour	2.50	25.00	250.00
Production Cost	0.60	6.00	60.00
Material cost @ 6 paise per component	0.60	6.00	60.00
Wages @ 72 paise per hour	1.20	12.00	120.00
Overheads @ ₹ 1.50 per machine hour	2.50	25.00	250.00
Total Cost	9.48	48.18	435.18
Cost per component (Total cost ÷ No. of Components)	0.94	0.48	0.44

12.2.1 Economic Batch Quantity (EBQ) In the above Illustration 12.1, it was seen that when batch size increases, the total cost per component decreases. It is due to the fixed nature of setting up cost which remains unchanged with the increase or decrease in the batch size. Thus larger the number of units in a batch, lower is the setting up cost per unit. In industries where batch costing is employed, an important point is the determination of the optimum quantity in a batch at which cost per unit is minimum. This is known as a Economic Batch Quantity. While determining economic batch quantity, two type of costs are considered: (a) Setting-up costs: This is the cost of setting the machine and the tools for production of a particular batch. This is of a fixed nature. Therefore, when the size of the batch is large, setting-up cost per article in the batch is lower. (b) Carrying cost: This includes the cost of storage, interest on capital invested, etc. Larger size of a batch leads to higher carrying costs. In determining the economic batch quantity, there are five main considerations: (a) The cost and time taken in setting up the tools on the machines (b) The cost and time taken in manufacturing the parts (c) The interest on capital invested in the parts (d) The cost of storage (e) The rate of consumption or sale of the parts

Batch Costing NOTES Self-Instructional Material 231 As the concept of economic batch quantity is similar to economic order quantity (See the unit on Material Cost), the former can also be determined with the help of tables, mathematical formulae and graphs. A simple formula for determining the economic batch quantity is given below: $EBQ = \sqrt{\frac{2US}{C}}$

U S C

where EBQ = Economic Batch Quantity U = No. of units to be produced in a year S = Set-up costs per batch C = Carrying cost per unit of production. Example: U = Production per year = 12,000 units S = Set-up costs per batch = ₹ 150 C = Carrying cost per unit = ₹ 0.20 $EBQ = \sqrt{\frac{2 \times 12,000 \times 150}{0.20}} = 4,243$ units

Illustration 12.2:

A contractor has to supply 10,000 paper cones per day to a textile mill. He finds that when he starts a production run, he can produce 25,000 paper cones per day. The cost of holding a paper cone in stock for one year is 2 paise and the setting-up cost of a production run is ₹ 18. How frequently should production runs be made? (ICWA Inter) Solution: Economic Batch Quantity (EBQ) = 2.U.

S C

where U = Units to be produced = 10,000 × 365 days = 36,50,000 S = Setting-up cost per production run or batch = ₹ 18 C = Carrying cost per unit for one year = ₹ 0.02 $EQB = \sqrt{\frac{2 \times 36,50,000 \times 18}{0.02}} = 81,056$ units Production per batch = 81,056 units Frequency of production runs = $\frac{36,50,000}{81,056} = 45$ (Approx.)

Thus, a production run should be made after every 8 days. Example 1: Leo Limited undertakes to supply 1,000 units of a component per month for the months of January, February and March 2010. Every month a batch order is opened against which materials and labour cost are booked at

Batch Costing NOTES Self-Instructional 232 Material actuals. Overheads are levied at a rate per labour hour. The selling price is contracted at ₹15 per unit. From the following data, present the profit per unit of each batch order and the overall position of the order for the 3,000 units. Month Batch Output Material Cost Labour Cost (Numbers) Jan. 2010 1,250 6,250 2,500 February 2010 1,500 9,000 3,000 March 2010 1,000 5,000 2,000 Labour is paid at the rate of ₹2 per hour. The other details are: Month Overheads Total Labour Hours January 2010 12,000 4,000 February 2010 9,000 4,500 March 2010 15,000 5,000 (CA Inter) Solution: Statement of Cost and Profit Per Unit of Each Batch Jan. 2010 Feb. 2010 March 2010 Total (a) Batch Output (Nos.) 1,250 1,500 1,000 3,750 (b) Sales Value (@ ₹15 per unit) 18,750 22,500 15,000 56,250 Cost Material 6,250 9,000 5,000 20,250 Wages 2,500 3,000 2,000 7,500 Overheads (See working notes) 3,750 3,000 3,000 9,750 (c) Total 12,500 15,000 10,000 37,500 (d) Profit per batch (b) – (c) 6,250 7,500 5,000 18,750 (e) Cost per unit (c) ÷ (a) 10 10 10 (f) Profit per unit (d) ÷ (a) 5 5 5 Overall Position of the Order for 3,000 Units Sales value (3,000 units × ₹15) 45,000 Less: Total cost (3,000 units × ₹10) 30,000 Profit 15,000 Working Notes:

Overheads are charged on labour hour basis as under: Jan. 2010 Feb. 2010 March 2010 (i) Labour hours:

Labour cost Labour rates per hour = 2,500 ÷ 2 = 1,250 = 3,000 ÷ 2 = 1,500 = 2,000 ÷ 2 = 1,000

Batch Costing NOTES Self-Instructional Material 233 (ii) Overheads per hour: Total overheads

Total labour hours = 12,000 4,000 + 9,000 4,500 + 15,000 5,000 = 3 = 2 = 3 (

iii) Overheads for batch (i) × (ii) = 3,750 = 3,000 = 3,000 Check Your Progress 1. What is implied about the setting up cost with a larger batch size in batch costing? 2.

Give some examples of carrying costs. 12.3 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS 1.

In batch costing, the larger the batch size, the lower is the setting up cost per article. 2.

Some examples of carrying costs include the cost of storage, interest on capital invested, etc. 12.4 SUMMARY ?

Batch costing is a variation of job costing. While job costing is concerned with costing of jobs that are made to a customer's particular requirements, batch costing is used when production consists of limited repetitive work and a definite number of articles are manufactured in each batch to be held in stock for sale to customers generally. ?

Batch costing is applied in the manufacture of shoes, toys, readymade garments, component parts of say, cars, radios, watches, etc. ?

For ascertaining the cost of each batch, a batch cost sheet is prepared for which a batch number is assigned to each batch of production. ? In industries where batch costing is employed, an optimum quantity in a batch is determined at which cost per unit is minimum. This is known as a economic batch quantity (

EBQ). The concept of EBQ is similar to economic order quantity (EOQ) as discussed in the chapter on material cost. 12.5

KEY WORDS ? Batch: It

is a cost unit consisting of a group of identical

items ?

Economic Batch Quantity: It refers to the optimum quantity in a batch at which cost per unit is minimum

Batch

Costing NOTES Self-Instructional 234 Material 12.6 SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer Questions 1.

What is the difference between job and batch costing? 2. Write a short note on the applicability of batch costing. 3. How are jigs and tools treated under batch costing? Long Answer Questions 1. Explain the preparation of comparative cost sheet with an example. 2. Describe the concept of Economic Batch Quantity. 12.7

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Standard Costing NOTES Self-Instructional Material 235 UNIT 13 STANDARD COSTING Structure 13.0 Introduction 13.1

Objectives 13.2 Standard Costing: Definition, Application, Advantages and Limitations 13.3 Variance Analysis 13.4 Answers

to Check Your Progress Questions 13.5 Summary 13.6 Key Words 13.7 Self Assessment Questions and Exercises 13.8

Further Readings 13.0 INTRODUCTION

In historical costing only actual costs are ascertained. Historical costs are the actual costs which have been incurred in the past. Such costs are ascertained only after these have been incurred. In the initial stages of development of cost accounting, historical costing was the only system available for ascertaining costs.

A system of historical costing suffers from the following limitations: 1. No basis for cost control: Historical costs cannot be used for the purpose of cost control as the cost has already been incurred before the cost figures can become available to management. 2. No yardstick for measuring efficiency: Historical costs do not provide any yardstick against which efficiency can be measured. It only indicates the actual cost which is of little value in measuring performance efficiency. 3. Delay in availability of information: Cost data under historical costing is obtained too late and is not of much use in price quotations and production planning. 4. Expensive system: Historical costing is comparatively an expensive system of costing as it involves the maintenance of a larger volume of records. The above given limitations of Historical costing encouraged the development of a more satisfactory standard costing approach based on predetermined costs. Standard costing is not an alternative system to job order or process costing. It is a special technique to control costs and can be used in conjunction with any other system like job costing, process costing or marginal costing.

In this unit, you will study the concept of standard costing and variance analysis.

Standard Costing

NOTES Self-Instructional 236 Material 13.1 OBJECTIVES After going through this unit, you will be able to: ? Describe the meaning and applicability of standard costing ? Discuss the advantages and limitations of standard costing ? Explain the different types of variances ? Discuss the treatment of different cost variances 13.2 STANDARD COSTING: DEFINITION, APPLICATION, ADVANTAGES AND LIMITATIONS

The word standard means 'a norm' or a criterion. Standard cost is thus a criterion cost which may be used as a yardstick to measure the efficiency with which actual cost has been incurred. In other words, standard costs are predetermined costs or target costs that should be incurred under efficient operating conditions. According to Chartered Institute of Management Accountants (CIMA), London, 'Standard cost is the predetermined cost

based on technical estimates for materials,

labour and overhead for a selected period of time for a prescribed set of working conditions'.

In the words of Brown and Howard, 'the standard cost is a predetermined cost which determines what each product or service should cost under given circumstances'. Thus standard costs are planned costs that should be attained under a given set of operating conditions. The main object of standard cost is to look forward and assess what the cost 'should be' as distinct from what the cost has been in the past.

Definition

Standard costing is simply the name given to a technique whereby standard costs are computed and subsequently compared with the actual costs to find out the differences between the two. These differences (known as variances) are then analysed to know the causes thereof so as to provide a basis of control. The CIMA, London has defined standard costing as 'the preparation of standard costs and applying them to measure the variations from actual costs and analysing the courses of variations with a view to maintain maximum efficiency in production.'

Brown and Howard have defined it, 'as a technique of cost accounting which compares the standard cost of each product or service with the actual costs, to determine the efficiency of the operations so that any remedial action may be taken immediately.'

Standard Costing

NOTES Self-Instructional Material 237

Steps: Standard costing system involves the following steps: 1. The setting of standard costs for different elements of cost, i.e., material, labour and overheads. 2. Ascertaining actual costs. 3. Comparing standard with actual costs to determine the differences between the two, known as 'variances'. 4. Analysing variances for ascertaining reasons thereof. 5. Reporting of these variances and analysis thereof to management for appropriate action, where necessary. Application

The application of standard costing requires certain conditions to be fulfilled. These are: (a) A sufficient volume of standard products or components should be produced. (b) Methods, operations and processes should be capable of being standardized. (c) A sufficient number of costs should be capable of being controlled. Industries producing standardized products which are repetitive in nature, i.e., industries using process costing method, fulfil all the above conditions and thus the system can be used to the best advantage in such industries. Examples are fertilizers, cement, steel and sugar. In jobbing industries, it is not worthwhile to develop and employ a full system of standard costing. This is because in such industries each job undertaken may be different from another and setting standards for each job may prove difficult and expensive. In such industries, therefore, a partial system may be adopted in appropriate circumstances. For example, certain processes and operations performed may be of a repetitive nature and thus the principles of standard costing may be applied by setting standard for each such process or operation. Advantages of

Standard Costing

The advantages to be derived from a system of standard costing will vary from one business to another. Much depends upon the degree of sophistication achieved and the acceptance by the management of utility of the system. Possible advantages are as follows: 1. Effective cost control: The most important advantage of standard costing is that it facilitates the control of costs. Control is exercised by comparing actual performance with standards and taking action on the basis of variances so revealed. 2. Helps in planning: Establishing standards is a very useful exercise in business planning which instils in management a habit of thinking in advance.

Standard Costing NOTES Self-Instructional 238 Material 3. Provides incentives: Standards provide incentives and motivation to work with greater effort. Schemes may be formulated to reward those who achieve or surpass the standard. This increases efficiency and productivity. 4. Fixing prices and formulating policies: Standard costs are a valuable aid to management in determining prices and formulating production policies. For example, prices may be fixed by adding a standard margin of profit to standard cost. Similarly, standard costing furnishes cost estimates while planning production of new products. 5. Facilitates delegation of authority: In order that responsibility for off- standard performance may be identified directly with the persons concerned, an organization chart is prepared which shows delegated authority and establishes responsibility of each executive. 6. Facilitates coordination: While establishing standards, the performance of different departments, such as production, sales and purchases, is taken into account. Thus through the working of standard cost system, coordination of various functions is achieved. 7. Eliminates wastes: By fixing standard, certain wastes, such as material wastage, idle time and lost machine hours, are reduced. 8. Valuation of stocks: Standard costing simplifies the valuation of stock because the stock is valued at standard cost. The difference between standard and actual cost is transferred to a variance account. This ensures uniform pricing of stocks in the form of raw materials, work-in-progress and finished goods. 9. Management by exception: Reporting of variances is based on the principle of management by exception. Only variances beyond a predetermined limit may be considered by the management for corrective action. This also reduces the cost of preparing reports. 10. Economical and simple: Standard costing is an economical and simple means of cost accounting and generally results in savings in the cost of costing system. It results in reduction in paperwork in accounting and needs fewer number of forms and records. This leads to considerable saving in clerical labour.

Limitations of Standard Costing Standard costing system may suffer from certain disadvantages. This may be because of lack of education and communication and resultant misunderstanding on the part of managerial staff. Possible disadvantages are: 1. The system may not be appropriate to the business. 2. The staff may not be capable of operating the system.

Standard Costing NOTES Self-Instructional Material 239 3.

A business may not be able to keep standards up-to-date. In other words, a business may not revise standards to keep pace with the frequent changes in manufacturing conditions. Firms may avoid revising standards as it is a costly affair. 4. Inaccurate and unreliable standards cause misleading results and thus may not enjoy the confidence of the users of the system. 5. Operation of the standard costing system is a costly affair and small firms cannot afford it. 6. Standard costing is expensive and unsuitable in job order industries which are manufacturing non-standardized products. Preliminaries in Establishing a System of Standard Costing In establishing a system of standard costing, there are a number of preliminaries to be considered. These are as follows: 1. Establishment of Cost Centres 2.

Classification of Accounts 3. Types

of Standards Standards may be divided into the following two main classes—basic and current. Basic standards: These are the standards which are established for an indefinite period of time. They are similar to an index number against which all later results are measured. Variances from basic standards show trends of deviation of the actual cost. However, basic standards are of no practical utility from the point of view of cost control. Current Standards: Such standards remain in operation for a limited period and are related to current conditions. These standards are revised at regular intervals. Current standards are of three types: (i) Ideal standards; (ii) Expected standards; and (iii) Normal standards. 4.

Setting Standard Costs The success of a standard costing system depends on the reliability, accuracy and acceptance of the standards. Extreme care, therefore, must be taken to ensure that all factors have been considered in the establishment of standards. Standard costs are set for each element of cost, i.e., direct materials, direct labour and overheads. These are described below: Setting standards for direct materials: Two standards are developed for material costs: (a) Material price standard (b) Material usage (or quantity) standard (a) Material price standard: This is a forecast of the average prices of materials during the future period. This standard is quite difficult to establish because prices

Standard Costing NOTES Self-Instructional 240 Material are regulated more by the external factors than by the company management. The purchasing department notifies the standard prices after considering factors like: (i) Purchase prices of recent orders (ii) Prices specified in the long-term contracts (iii) Forecasts of the commodity price trends Provision should be made for discounts, packing and delivery charges. (b) Material quantity (or usage) standard: While setting quantity standard, the quality and size of material items to be consumed should be standardized. The standard is usually developed from material specifications prepared by the department of engineering or product design. Setting standards for direct labour: The following two standards are usually established for direct labour costs: (a) Labour rate standard (b) Labour time standard (a) Labour rate standard: This standard is determined having regard to the current rates of pay and any anticipated variations. Sometimes an agreement between trade unions and employer covers a number of future months or years. In such cases, the agreed rate should be adopted as the standard rate for the period. Where workers are paid on time basis, it is necessary to establish: (i) the labour time standard for each operation (ii) the wage rate of each grade of labour (iii) the grades of labour to be employed The type of operation will determine the grade of labour to be employed— male or female, skilled, unskilled or semi-skilled. Where workers are paid on piece basis, the standard cost will be a fixed rate per piece. (b) Labour time (or efficiency) standard: Standard time for labour should be scientifically determined by time and motion studies, carried out in conjunction with a study to determine the most efficient method of working. Due allowance should be made for normal loss of labour time, like fatigue, idle time, tool setting, etc. Setting Standards for Direct Expenses: Direct expenses are not very common, but if there are any direct expenses relating to the cost unit, standards for these too must be set. Setting these standards is usually quite simple, as these may be based on past records, adjusted according to anticipated changes therein. Setting Standards for Overheads: Setting standards for overheads is more complex than the development of material and labour standards. Developing this standard involves the following two distinct calculations:

Standard Costing NOTES Self-Instructional Material 241 (a) Determination of the standard overhead costs; and (b) Determination of the estimates of production, i.e., standard level of activity reduced to a common base, such as direct labour hours, units of production or machine hours. A standard overheads absorption rate is computed with the use of these two figures by the following formula:

Standard overhead cost for the period Standard overhead rate (per hour) Standard hours for the period ? or Standard overhead cost for the period Standard overhead rate (per unit) Standard production (in units) for the period ?

Thus this rate may be per unit of production when base is in units of production and it will be per hour, if base is the number of hours. An overall blanket rate of overheads absorption is rarely accurate in any costing system. Thus a separate rate should be computed for each cost centre (or department) created for this purpose. Overhead standards will be more useful to management if they are divided to show fixed and variable components. Separate overheads absorption rates should be computed for these two types of overheads, i.e., fixed overheads and variable overheads. Standard Hour Production may be expressed in diverse type of units such as kilograms, tonnes, litres, gallons, numbers, etc. When a company is manufacturing different types of products, it is almost impossible to aggregate the production, which cannot be expressed in the same unit. Therefore, it is essential to have a common unit in which the production, which is measured in different type of units, can be expressed. As time factor is common to all operations, a common practice is to express the various units in terms of time, known as standard hour. The standard hour is the quantity of output or amount of work which should be performed in one hour. In the words of CIMA, London, a standard hour is 'a hypothetical hour which represents the amount of work which should be performed in one hour under stated conditions.' Time and motion studies may indicate what the output of each process in one hour should be. For example, if 10 units of product should be produced in one hour, then an output of 200 units would represent 20 standard hours. Standard Cost Card (Standard Cost Sheet) Once the standard costs have been established, these are recorded on a standard cost card. A standard cost card is thus a record of the standard material, labour and overhead costs. Such a card is maintained for each product or service. The

Standard Costing NOTES Self-Instructional 242 Material card will normally show the quantity and price of each material item to be consumed, the time and rate of labour required, the overheads to be absorbed and the total cost. Costs shown in the card should be approved by the person who will be responsible for the operations concerned, otherwise he may not cooperate with much enthusiasm in attaining the standards. Check Your Progress 1. Why is it not worthwhile to develop and employ a full system of standard costing in jobbing industries? 2. Name the three types of current standards. 3.

What does the transfer of variance between standard cost and actual cost to a variance account ensure? 13.3 VARIANCE ANALYSIS

Cost

Variance: Cost variance is the difference between a standard cost and the comparable actual cost incurred during a period.

CIMA, London.

Variance analysis is the process of analysing variances by sub-dividing the total variance in such a way that management can assign responsibility for any off standard performance.

According to CIMA, London, Terminology, variance analysis is the process of computing the amount of variance and isolating the causes of variance between actual and standard.

An important aspect of variance analysis is the need to separate controllable from uncontrollable variances. A detailed analysis of controllable variances will help the management to identify the persons responsible for its occurrence so that corrective action can be taken.

Favourable and Unfavorable Variances Where

the actual cost is less than standard cost, it is known as favourable or credit variance. On the other hand, where the actual cost is more than standard cost,

the difference is referred to as unfavourable, adverse or debit variance. In simple words, any variance that has a favourable effect on profit is favourable variance and any variance which has an adverse or unfavourable effect on profit is unfavourable variance. Many students experience difficulty in ascertaining whether a variance is favourable or adverse. In the formulae given in this book, positive (+) variance will indicate favourable variance and negative (-) variance will indicate adverse variance. Favourable variances will be designated by (F) and Adverse by (A). Controllable and Uncontrollable Variances If a variance can be regarded as the responsibility of a particular person, with the result that his degree of efficiency can be reflected in its size, then it is said to be a

Standard Costing NOTES Self-Instructional Material 243
controllable variance. For example, excess usage of material is usually the responsibility of the foreman concerned. However, if the excessive usage is due to material being defective, the responsibility may rest with the Inspection Department for non-detection of the defects. If a variance arises due to certain factors beyond the control of management, it is known as uncontrollable variance. For example, change in the market prices of materials, general increase in the labour rates, increase in the rates of power or insurance premium, etc., are not within the control of the management of the company. Responsibility for uncontrollable variances cannot be assigned to any person or department. The division of variances into controllable and uncontrollable is extremely important. The management should place more emphasis on controllable variance as it is these variances which require investigation and possibly corrective action. The uncontrollable variances, on the other hand, may be ignored. This follows the well known principle of exception whereby those matters which are going right are ignored and any deviations from efficient performance are investigated. Methods Variance While setting standards, specific methods of production are kept in view. If, for some reason or the other, a different method of production is adopted, it will give rise to a different amount of cost, thereby resulting in a variance. Such a variance is known as methods variance. Thus a methods variance arises due to the use of methods other than those specified. According to CIMA, London Terminology, methods variance is 'the difference between the standard cost of a product or operation, produced or performed by the normal method and the standard cost of a product or operation, produced or performed by the alternative method actually employed.' Revision Variance After setting standards, sometimes standard cost has to be revised on account of unavoidable changes in prices of various factors like wages, materials, etc. The standard costs once set are not disturbed every now and then to account for these uncontrollable factors. Rather a revision variance is created and the basic standard cost is allowed to stand. This revision variance is the difference between the standard cost originally set and the revised standard cost.

Thus:
Original standard Revised standard Revision variance cost of actual output cost of actual output ? ?
Creation of revision variance is only an interim adjustment which allows the standard costing system to operate usefully even when there are changes in standard costs.

Standard Costing NOTES Self-Instructional 244 Material

Variances for each Element of Cost The total cost variance is divided into Material, Labour and Overheads variances. Material Variances The different material variances are as follows: Direct

Material Cost Variance This is the difference between the standard cost of direct materials specified for the output achieved and the actual cost of direct materials used. It is calculated as: Material Cost Variance = Standard cost of actual output – Actual cost MCV = SC – AC or Material Cost Variance =

Standard quantity Standard Actual Actual price quantity price for actual output ? ? ? ? ? ? ? ? ? ? ? ?
MCV = (SQ × SP) – (AQ × AP) The material cost variance may be further divided into price variance and usage variance. Material Price Variance This is 'that portion of the material cost variance which is due to the difference between the standard price specified and the actual price paid'. It is calculated by the following formula: Material Price Variance = (Standard price – Actual price) × Actual quantity MPV = (SP – AP) × AQ

Thus, this is the difference between standard price and actual price multiplied by actual quantity.

Reasons for Material Price Variance: This variance usually arises due to the following reasons: 1. Change in the market prices of materials 2. Failure to purchase the specified quality, thereby resulting in a different price being paid 3. Change in the quantity of materials, thereby leading to lower/higher quantity discount 4. Not availing cash discounts, when standards set took into account such discounts. 5. Inefficient purchasing 6. Change in the delivery costs 7. Rush purchases 8. Purchase of a substitute material on account of non-availability of the material specified

Standard Costing NOTES Self-Instructional

Material 245 9. Change in the rates of excise duty, purchase tax, etc. 10. Off-season purchasing for certain seasonal products, like jute, cotton, etc. Material Usage (or Quantity) Variance This

is 'that portion of the material cost variance which is due to the difference between the standard quantity specified and the actual quantity used'. Its formula is: Material Usage Variance =

Standard quantity Actual

Standard × quantity price for actual output ?

MUV = (SQ – AQ) × SP Thus, this is the difference between standard quantity and actual quantity multiplied by the standard price. Example: Continuing example given above, material usage variance will be calculated as under: MUV = (SQ – AQ) × SP = (4,000 – 4,300) × 5 = ` 1,500 (A) Reasons for Material Usage Variance: The material usage variance may be caused by some or all of the following reasons: 1.

Use of defective or sub-standard materials 2. Carelessness in the use of materials 3. Pilferage 4. Poor workmanship 5. Defect in plant and machinery 6. Change in the design or specification of the product 7.

Change in the quality of materials 8. Use of substitute materials 9. Use of non-standard material mixture 10. Yield from materials

in excess of or less than standard yield Classification of Material Usage Variance Material usage variance

is further sub-divided into: (a) Material mix variance (b) Material yield variance (Or Material sub-usage variance) (

a) Material Mix Variance: This is sub-variance of material usage variance. It arises only where more than one type of material is used for producing the finished product. A company may be using a mixture of materials which does not comply with the predetermined standard mixture.

This gives rise to material mix variance.

Standard Costing NOTES Self-Instructional 246 Material

The material mix variance is defined as

that portion of the material usage variance which is due to the difference between standard and actual composition of materials. It may arise in industries like chemicals, rubber, etc., where a number of raw materials are mixed to produce a final product. Change from the standard mix may be

due to non-availability of one or more components of the mix or due to non-purchase of materials at proper time.

Increase in the proportion of cheaper

materials results in favourable mix variance and vice versa, the use of more expensive materials in larger proportion results in adverse variance. This variance is calculated with the help of the following formula: Material mix variance =

Revised standard Actual Standard quantity quantity price ? ? ? ? ? ? ? ?

MMV = (RSQ – AQ) × SP The revised standard quantity is nothing but the standard proportion of total of actual quantities of all the materials. This is calculated as under:

Total of actual quantities Standard quantity of one material = × of all materials

Total of standard quantities of all materials RSQ (b) Material Sub-usage (or Material Revised Usage) Variance:

This is a sub-variance of the

material usage variance and represents that portion of the material usage variance which is attributed to reasons other than those which give rise to material mix variance. Thus the algebraic sum of this revised usage variance and material mix variance is equal to material usage variance. Its formula is:

Material revised usage variance = ? ? ? ? ? ? ? Standard Revised standard Standard price quantity quantity

MRUV = (SQ – RSQ) × SP

Material Yield Variance:

This is also a sub-variance of material usage variance. It

arises in process industries, like chemicals, where loss of materials in production is inevitable. While setting standards, the normal or standard loss is taken into account. But actual loss may differ from normal or standard loss. This results in actual yield or output being different from standard yield. Thus

material yield variance is that portion of the material usage variance which is due to the difference between standard yield specified and actual yield obtained. The

standard yield is the output expected to be obtained from the actual usage of raw materials. It should be noted that yield variance as used in standard costing is the same thing as abnormal loss or abnormal gain in the other costing systems. One important feature of yield variance which differentiates it from other material variances (price, usage and mix variances) is that yield variance is an output variance, while others are input variances. In other words, yield variance represents a gain or loss on output in terms of finished production, while other

Standard Costing NOTES Self-Instructional Material 247

variances represent a gain or loss on the cost of material input. Its formula is given on the following page:

Material Yield Variance = Actual Standard Standard \times yield yield Output Price ?

$$MYV = (AY - SY) \times SOP$$

Standard output price (SOP) is the standard material cost per unit of output. Note: Material revised usage variance and Material yield variance are two different methods of calculating the same thing and are hence clubbed together.

Illustration 13.1: The standard mix to produce one unit of product is as follows: Material A 60 units @ `15 per unit = 900 Material B 80 units @ `20 per unit = 1,600 Material C 100 units @ `25 per unit = 2,500 240 units 5,000 During the month of April, 10 units were actually produced and consumption was as follows: Material A 640 units @ `17.50 per unit = 11,200 Material B 950 units @ `18.00 per unit = 17,100 Material C 870 units @ `27.50 per unit = 23,925 2,460 units 52,225

Calculate all material variances. Solution: Standard for 10 units Actual for 10 units Material Qty Rate Amt Qty Rate Amt units ` ` Units ` ` A 600 15 9,000 640 17.50 11,200 B 800 20 16,000 950 18.00 17,100 C 1,000 25 25,000 870 27.50 23,925

Total 2,400 50,000 2,460 52,225 1. Material Cost Variance = Standard cost - Actual cost = `50,000 - `52,225 (A) MCV = `2,225(A)

2. Material Price Variance = (Std Price - Actual Price) \times Actual Qty Material A = (15 - 17.50) \times 640 = `1,600 (A)

Material B = (20 - 18) \times 950 = `1,900 (F) Material

C = (25 - 27.50) \times 870 = `2,175 (A) MPV = `1,875 (A)

Standard Costing NOTES Self-Instructional 248 Material 3.

Material Usage Variance = (Std Qty - Actual Qty) \times Std Price

Material A = (600 - 640) \times 15 = `600 (A) Material B = (800 - 950) \times 20 = `3,000 (A) Material C = (1,000 - 870) \times 25 = `3,250 (F) MUV = `350 (A) Check: MCV = MPV + MUV `2,225 (A) = `1,875 (A) + `350 (A) 4.

Material Mix Variance = (Revised Std Qty - Actual Qty) \times Std Price Material A = (615* - 640) \times 15 = `375 (A) Material B = (820* - 950) \times 20 = `2,600 (A) Material C = (1,025* - 870) \times 25 = `3,875 (F) MMV = `900 (F) *Revised Standard Quantity (RSQ) is calculated as follows: Material A = 2,460 2,400 \times 600 = 615 units Material B = 2,460 2,400 \times 800 = 820 units

Material C = 2,460 2,400 \times 1,000 = 1,025 units 5. Material Yield Variance For yield variance, certain basic calculations have to be made as follows:

Standard yield =

Actual usage of materials Standard usage per unit of output = 2,460 240 = 10.25

units SOP (Std material cost per unit

of output) = `50,000 \div 10 units = `5,000

Material Yield Variance = (AY - SY) \times SOP MYV = (10 - 10.25) \times 5,000 =

`1,250(A) Material Revised Usage (or

Sub-usage) Variance (MRUV) = (Standard Quantity - Revised Standard Quantity) \times Standard Price

Material A = (600 - 615) \times 15 = `225 (A) Material B = (800 - 820) \times 20 = `400 (A) Material C = (1,000 - 1,025) \times 25 =

`625 (A) MRUV = `1,250 (A) Note: Either MMV or MRUV is calculated. These two are always equal. Check:

Standard Costing NOTES Self-Instructional Material 249

Labour Variances The analysis and computation of labour variances is quite similar to material variances.

Labour Cost Variance This is the difference between the standard direct labour cost specified for the activity achieved and the actual direct labour cost incurred. It is calculated as under: Labour Cost Variance = ?

Std labour cost Actual labour of actual output cost LCV = SC - AC Or, Labour Cost Variance = ? ? ? ? ? ? ? ? ? ? ? ? rate St hours St d d Actual rate Actual - - -

for actual output per hour hours per hour

LCV = (SH \times

SR) - (AH \times AR)

Classification of Labour Cost Variance Labour cost variance is further divided into rate variance and

efficiency variance. Labour Rate Variance: This is that portion of the labour cost variance which is due to the difference between the standard rate

of labour

specified and the actual rate paid. Its formula is: Labour Rate Variance = (Standard rate - Actual rate) \times Actual hours LRV = (SR - AR) \times AH

Thus, this is the difference between standard and actual rates of wages, multiplied by actual hours.

Reasons for labour rate variance: Usual reasons are: 1. Change in the basic wage rates 2. Use of a different method of wage payment 3. Employing workers of grades different from the standard grades specified 4.

Unscheduled overtime 5. New workers not being paid at full rates Often, labour rate variance will be an uncontrollable variance as labour rates are usually determined by demand and supply conditions in the labour market, backed by negotiable strength of the trade union. Where this variance is due to the use of a grade of labour other than that specified, there may well be such acceptable explanations as non-availability of the labour grade specified. But when a foreman carelessly employs a wrong grade of labour on a job, he may be held responsible.

Standard Costing NOTES Self-Instructional 250 Material

Labour Time (or Efficiency) Variance: This is that portion of the labour cost variance which is due to the difference between labour hours specified

for actual output and the actual labour hours expended. This variance is calculated as follows: Labour Efficiency Variance =

Actual Std hours for × Standard rate hours actual output ?

LEV = (SH – AH) × SR Thus, this variance is the difference between standard and actual time valued at standard rate.

Reasons for labour efficiency variance: This variance is usually caused by one or more of the following reasons: 1. Poor working conditions, e.g., inadequate lighting and ventilation, excessive heating, etc. 2.

Defective tools and plant and machinery 3. Inefficient workers 4. Incompetent supervision 5. Use of defective or non-standard materials 6. Time

wasted by factors, like

waiting for materials, tools or machine break-down 7. Insufficient training of workers 8. Change in the method of

operation 9. Non-standard grade of workers Classification of Labour Efficiency Variance Labour efficiency variance is

further divided into the following sub-

variances: (

a) Idle time variance (b) Labour mix variance (c) Labour yield variance (or Labour revised efficiency variance) (a) Idle Time Variance:

This variance represents that portion of the labour efficiency variance which is due to abnormal idle time, such as time lost due to machine break-down, power failure, strike, etc. It is calculated by valuing idle hours at standard rate. Thus:

Idle Time Variance = Idle hours × Standard rate ITV = IH × SR

As idle hours represent a loss, idle time variance is always unfavourable. Some accountants do not treat Idle Time Variance as a part of labour efficiency variance but treat it as a part of labour cost variance.

Standard Costing NOTES Self-Instructional Material 251 (

b) Labour Mix Variance (Gang Composition Variance): This variance is similar to material mix variance. It arises only when more than one grade of workers are employed and the composition of actual grade of workers differs from those specified. It is calculated with the help of following formula:

Labour Mix Variance =

Revised standard Actual × Standard rate hours hours ?

LMV = (RSH – AH) × SR (

c) Labour Revised Efficiency Variance (Or Labour

Sub-efficiency Variance): This is similar to Material Revised Usage Variance and is a sub-variance of labour efficiency

variance. It arises due to factors other than those which give rise to idle time variance and labour mix variance. Thus, this is a residue of labour efficiency variance left after idle time and mix variance have been separated. Its formula is: Labour

Revised Efficiency Variance = ? ? ? ? ?

Std hours for Revised × Std rate actual output std hours

LREV = (SH – RSH) × SH Labour Yield Variance: This is quite similar to Material Yield Variance. This variance reveals the effect on labour cost of actual output or yield being more or less than the standard yield. Its formula is: Labour Yield

Variance = ?

Actual Std yield Std labour cost × yield from actual input per unit of output

Note: Labour revised efficiency variance and Labour yield variance are two methods of calculating the same thing, and are hence clubbed together. Illustration 13.2: The standard labour employment and the actual labour engaged in a week

for a job are as under: Skilled Semi-skilled Unskilled workers workers workers Standard no. of workers in the gang 32 12 6 Actual no.

of workers employed 28 18 4 Standard wage rate per hour 3 2 1 Actual wage rate per hour 4 3 2 During the 40

hours working week, the gang produced 1,800 standard labour hours of

work. Calculate: (

a) Labour Cost Variance (b) Labour Rate Variance (c) Labour Efficiency Variance (

d) Labour Mix Variance (

e) Labour Yield Variance (CA Inter)

Standard Costing NOTES Self-Instructional 252 Material Solution: Standard Actual Category Hrs* Rate Amount Hrs* Rate
 Amount of workers ` ` ` ` Skilled 1,280 3 3,840 1,120 4 4,480 Semi-skilled 480 2 960 720 3 2,160 Unskilled 240 1 240
 160 2 320 2,000 5,040 2,000 6,960 *Hrs = No. of workers x 40 hours. Std cost of actual output = 5,040 2,000 hrs ` x
 1,800

hrs = ` 4,536 Labour Cost Variance = Std cost of actual output – Actual cost LCV = ` 4,536 – 6,960 = ` 2,424 (A) Labour
 Rate Variance = (SR – AR) x AH Skilled = (3 – 4) x 1,120 = ` 1,120 (A) Semi-skilled = (2 – 3) x 720 = ` 720 (A) unskilled = (1 –
 2) x 160 = ` 160 (A) LRV = ` 2,000 (A) Labour Efficiency Variance= (*SH for actual output – AH) x SR Skilled = (1,152 –
 1,120) x 3 = ` 96 (F) Semi-skilled = (432 – 720) x 2 = ` 576 (A) Unskilled = (216 – 260) x 1 = ` 56 (F) LEV = ` 424 (A) *Std hrs
 for actual output are calculated as follows: Skilled = 1800 2 000 , , x 1,280 = 1,152 hrs Semi-skilled = 1800 2 000 , , x
 480 = 432 hrs Unskilled = 1800 2 000 , , x 240 = 216 hrs Labour Mix Variance = (Revised std hrs – AH) x SR Skilled =
 (1,280 – 1,120) x 3 = ` 480 (F) Semi-skilled = (480 – 720) x 2 = ` 480 (A) Unskilled = (240 – 160) x 1 = ` 80 (F) LMV = ` 80
 (F)

Standard Costing NOTES Self-Instructional Material 253

Labour Yield Variance =

Actual Std output for *Std rate per hour of work output actual hours ? ?

LYV = (1,800 – 2,000) x 5,040 2,000 = ` 504 (A) Check:

Overheads Variances

Overhead cost

76%

MATCHING BLOCK 94/95

SA

Cost Accounting, Study Material- new.pdf (D44082039)

is the aggregate of indirect materials, indirect labour and indirect expenses. Analysis of

overheads variances is different from that of direct material and direct labour variances and is considered to be a difficult part of variance analysis. There are mainly two reasons for this difficulty. Firstly, standard overhead rate for fixed overheads is difficult to establish because changes in the volume of output will distort this rate, even though there is no change in the amount of fixed overhead cost. Generally fixed overheads absorption rate is determined on the basis of normal volume of output. Secondly, there is conflicting terminology and different ways of computing overheads variances. Overheads variances may be separately computed for fixed overheads and variable overheads. Then there are two variance, three variance and four variance methods of analysing overheads variances. Moreover, overhead rate may be per hour or per unit of output. All these lead to confusion in overheads variance analysis. In this book, overheads variances have been classified into fixed and variable overheads variances and then further analysed according to causes. It is important to understand at the outset that overheads variance is nothing but under or over-absorption of overheads. Certain basic terms used in connection with overheads variances are explained first of all. Standard Overhead Rate: This standard overheads absorption rate may be computed per hour or per unit, depending upon the method of absorption. This is calculated as follows: ?

Budgeted overheads Standard overhead rate (per hour) Budgeted hours Or ? Budgeted overheads Standard overhead rate (per unit) Budgeted output (in units)

Standard Costing NOTES Self-Instructional 254 Material Where overheads variances are separately computed for fixed and variable overheads, separate overhead rates are to be computed for fixed overheads and variable overheads. When Overhead Rate per Hour is Used The following basic calculations should be made before computing variances: (a) Standard hours for actual output(SHAO): It is required to be calculated when overheads are absorbed on the basis of overhead rate per hour. It is calculated as under: SHAO =

Budgeted hours Budgeted output x Actual output (b) Absorbed (or Recovered) overheads = ? Std hrs for Std overhead actual output rate per hour (c) Standard overheads = ? Actual Std overhead hours rate per hour (d) Budgeted overheads = ? Budgeted Std overhead hours rate per hour (e) Actual overheads = Actual Actual overhead hours rate per hour ?

When Overhead Rate per Unit is used The following basic calculations should be made: (a) Standard output for actual hours (SOAH): It is required to be calculated when overheads are absorbed on the basis of overhead rate per unit. It is calculated as follows: SOAH =

Budgeted output (in units) Budgeted hours x Actual hours (b) Absorbed overheads = ? Actual Std overhead output rate per unit (c) Standard overheads = ? Std output Std overhead for actual time rate per unit (d) Budgeted overheads = ? Budgeted Std overhead output rate per unit (e) Actual overheads = Actual Actual overhead output rate per unit ?

Overhead Cost Variance This is the total overheads variance and can be described as the difference between total standard overheads absorbed and total actual overheads incurred. CIMA, London has defined it as 'the difference between the standard cost of overheads

Standard Costing NOTES Self-Instructional Material 255 absorbed in the output achieved and the actual overhead cost. Thus, this variance arises due to the actual overhead incurred differing from the standard overheads absorbed and is simply under or over-absorption of overheads. Its formula is: Overhead Cost Variance = Absorbed overheads – Actual overheads OCV = Std overheads

Std hours for Actual overheads absorption rate actual output ? ?

Variable overheads (V.O.) Variances Variable Overhead Cost Variance: It may be defined as the difference between absorbed variable overheads and actual variable overheads. Its formula is:

Variable Overhead Cost Variance = Std variable Actual overhead Std hours for ohds rate cost actual output ? ?

VOCV = (Absorbed V.O. – Actual V.O.) This variance is sub-divided into the following two variances: (a) Variable Overheads Expenditure Variance: This is also known as Spending Variance or Budget

Variance. This variance arises due to the difference between standard

variable overheads allowed and actual variable overheads incurred. Its formula is: V.O. Expenditure Variance =

Std variable Actual Actual overhead overhead rate hours cost ? ? = (

Standard V.O. – Actual V.O.) (b) Variable

Overhead Efficiency Variance: This variance arises

due to the difference between standard

hours allowed for actual output and actual hours. The reasons for this variance

are the same which give rise to labour efficiency variance. Its formula is as follows: V.O. Cost Variance =

Std variable Actual Std variable overhead rate hours overhead rate ? ? = (

Absorbed V.O. – Standard V.O.) Check: V.O. Cost Variance = ?

V.O. Expenditure V.O. Efficiency Variance

Variance Illustration 13.3: Calculate variable overheads variances from the following: Budgeted Actual Output (units)

20,000 19,000 Hours 5,000 4,500 Overheads – Fixed `10,000 10,500 Variable ` 5,000 4,800

Standard Costing NOTES Self-Instructional 256 Material Solution: Basic calculations: (a)

Std variable overhead rate = Budgeted overheads 5,000 1 per hour Budgeted hours 5,000 hours ? ? ` (b) Std hours for

actual output = Budgeted hours 5,000 Actual output = 19,000 Budgeted output 20,000 ? ? = 4,750

hours Absorbed fixed overheads = Std hrs for actual output × Std rate = 4,750 × 1 = ` 4,750 Standard fixed overheads =

Actual hrs × Std rate = 4,500 × 1 = 4,500 Calculation of Variances: (a) Variable Overhead Cost Variance = Absorbed ohds

– Actual variable ohds = 4,750 – 4,800 = ` 50 (A) (b) Expenditure Variance = Std overheads – Actual variable overheads =

4,500 – 4,800 = ` 300 (A) (c) Efficiency Variance = Absorbed overheads – Std overheads = 4,750 – 4,500 = ` 250 (F)

Check: V.O. Cost Variance = Expenditure Variance + Efficiency Variance 50 (A) = 300 (A) + 250 (F). Fixed Overheads (F.O.)

Variances Fixed Overhead Cost Variance: It is the difference between standard fixed overhead cost for actual output (or absorbed overheads) and actual fixed overheads. Its formula is: F.O. Cost Variance = ? ?

Std hours for Std F.O. Actual actual output rate fixed overheads =

Absorbed overheads – Actual overheads Fixed overhead cost variance is sub-divided into the following two variances: (a)

Fixed Overhead Expenditure Variance: This is also known as Spending Variance or Budget Variance. It arises due to the difference between budgeted fixed overheads and actual fixed overheads. Its formula is:

F.O. Expenditure Variance = ? Budgeted Actual

fixed overheads fixed overheads

Standard Costing NOTES Self-Instructional Material 257 (b)

Fixed Overheads Volume Variance: This variance arises due to the difference between standard

output and actual output. It

is defined as

that portion of overheads variance which arises due to the difference between standard

cost of overheads absorbed by actual production and the standard allowance for that output.

F.O. Volume Variance = ? ? Std hours for Budgeted Std rate actual

output hours = Absorbed Overheads – Budgeted Overheads Example: Calculate fixed overheads variances for the data given in Illustration 13.3. Solution: Basic calculations: (a)

Std fixed overhead rate = Budgeted fixed overheads Budgeted hours = 10,000 5,000 hrs ` = ` 2 (b) Std hours for actual

output = Budgeted hrs Actual output Budgeted output ? = 5,000 20,000 × 19,000 = 4,750

hrs (c) Absorbed fixed overheads = Std hrs for actual output × Std rate = 4,750 hrs × ` 2 = ` 9,500 Calculation of Variances:

(a)

Fixed Overhead Cost Variance = Absorbed fixed overheads – Actual fixed overheads = 9,500 – 10,500 = ` 1,000 (

A (b) Fixed Overhead Expenditure Variance = Budgeted overheads – Actual overheads = 10,000 – 10,500 = ` 500 (A)
 (c) Fixed Overheads Volume Variance = Absorbed fixed ohds – Budgeted overheads = 9,500 – 10,000 = ` 500 (A) Check:
 F.O. Cost Variance = Expenditure Variance + Volume Variance 1,000 (A) = 500 (A) + ` 500 (A) (B) When Overhead Rate per
 Unit is Used Whether standard overhead rate used is per hour or per unit, the results will be the same. Thus the variances
 calculated by both the methods would be identical. In fact, these are two different ways of looking at the same thing.
 Standard Costing NOTES Self-Instructional 258 Material Basic calculations: (i) Std fixed overhead rate = 12,500 / 12,500
 units = ` 1 per unit (ii) Std variable overhead rate = 50,000 / 12,500 units = ` 4 per unit (iii) Std output for actual hours =
 Budgeted output Budgeted hrs × Actual hours = 12,500 units 6,250 hrs × 5,750
 hrs = 11,500 units Calculation of Variances: Variable Overheads Variances: (a) Variable Overhead Cost Variance =
 Absorbed overheads – Actual overheads = (Actual output × Std rate) – Actual overheads = (11,000 × 4) – 45,000 =
 ` 1,000 (A) (b) Variable Overheads Budget Variance = (Standard overheads) – (Actual overheads) = ? ?
 Std output Actual Standard output rate for
 actual hrs = (11,500 × 4) – 45,000 = ` 1,000 (F) (c) Variable Overheads Efficiency Variance = Absorbed overheads – Std
 overheads = ? ?
 Std output Actual Standard output rate for actual hrs = (11,000 – 11,500) × ` 4 = ` 2,000 (A)
 Fixed Overheads Variances: (a) Fixed Overhead Cost Variance = Absorbed overheads – Actual overheads = ? ?
 Actual Actual Std rate output
 overheads = (11,000 × 1) – 13,000 = ` 2,000 (A) (b) Fixed Overheads Budget Variance = Budgeted overheads – Actual
 overheads = 12,500 – 13,000 = ` 500 (A) (c) Fixed Overheads Volume Variance = Absorbed overheads – Budgeted
 overheads = ? ? Actual Budgeted Std rate output output = (11,000 – 12,500) × ` 1 = ` 1,500 (A)
 Standard Costing NOTES Self-Instructional Material 259 Sub-division of Overheads Volume Variance Volume variance is
 further sub-divided into the following variances: 1. Efficiency Variance 2. Capacity Variance 3. Calendar Variance
 1. Fixed Overheads Efficiency Variance: This is defined as 'that portion of volume variance which reflects the increased or reduced
 output arising from efficiency above or below the standard which is expected.' This variance thus shows that the actual
 quantity produced is different from standard quantity because of higher or lower efficiency of workers engaged in
 production. Its formula is: Efficiency Variance = ?
 Absorbed fixed Standard fixed overheads overheads = ? ? Actual Std hrs for Std rate hours actual output 2.
 Fixed Overheads Capacity
 Variance: This is 'that portion of the volume variance which is due to
 working at higher or lower capacity usage than the standard.' Thus this variance arises when plant capacity actually
 utilized is more or less than the capacity planned to be utilized due to factors like idle time, under or over customer
 demand, strikes, power failure, etc. Its formula is: Capacity Variance = ? ? ? ? ?
 Budgeted Standard fixed overheads overheads Or = ? ? Actual hrs Budgeted Std rate worked hours 3.
 Calendar Variance: It may be
 defined as 'that portion of the
 volume variance which is due to the difference between
 the number of working days in the
 budget period and the number of actual working days in the period to which the budget is applied'. Calendar variance is
 actually volume variance arising due to a particular cause, i.e., actual number of working days being different from those
 budgeted, due to extra holiday being declared on the death of a national leader or any other reason. Calendar variance
 arises only in exceptional circumstances because normal holidays are taken into account while laying down the standards.
 When calendar variance is calculated, the calculation of capacity variance has to be modified so as to induct this
 additional variance into the analysis. Calendar variance is calculated by the following formula:
 Calendar Variance = ? ?
 Actual no. of Std no. of Std rate per day working days working days Or = ? ? Revised budgeted Budgeted Std rate per
 hour
 hours hours
 Standard Costing NOTES Self-Instructional 260 Material Generally, this variance is adverse because of extra holidays, but
 if there are extra working days (because of less holidays), then this variance will be favourable. Example: The following
 information is given: Std fixed overhead rate (per hour) ` 5 Budgeted hours 12,500 Std no. of working days 25 Actual
 hours 11,500 Actual no. of working days 22 Calculate Calendar Variance. Solution: Std no. of hrs per day = 12,500 ÷ 25
 days = 500 Revised budgeted hours = Std hours per day × Actual no. of days = 500 × 22 = 11,000 Calendar Variance =
 (11,000 – 12,500) × ` 5 = ` 7,500 (A) Alternative Method Std overhead rate per day = Std hrs per day × Std rate per hr = 500
 hrs × ` 5 = ` 2,500 Calendar Variance = ? ?
 Std rate Actual no. of Std no. of per day working days working days = (22 – 25) × 2,500 = ` 7,500 (A)
 A) Revised Capacity Variance When calendar variance is to be calculated, the method of calculating capacity variance has
 to be modified. The new formula in that case is as follows. Revised Capacity Variance =

Actual Revised – × Std rate per hr hours budgeted hours

In the example given above, capacity variance will be calculated as follows: Revised Capacity Variance = (11,500 – 11,000) × `5 = `2,500 (F) Reporting of Variances In order that a standard costing system may be of maximum value to management, it is essential that reports exhibiting variances from standards for each element of cost of each department and operation should be quickly and effectively presented to management. Furthermore, it is essential that management should act speedily to investigate variances and, where possible, make decisions to prevent recurrence of adverse variances.

Standard Costing NOTES Self-Instructional Material 261 Illustration 13.4: The standard cost card for product 'Simco' reveals: Standard materials – `2 kgs of A @ `2 per kg 4.00 1 kgs of B @ `6 per kg 6.00 Direct labour (3 hours @ `6 per hour) 18.00 Variable overheads (3 hours @ `4 per direct labour hour) 12.00 Total standard cost per unit 40.00 It is proposed to produce 10,000 units of 'Simco' in the month of March and budgeted costs on the information contained in the standard costs card are

as follows: Direct materials – A 20,000 kgs @ `2 per kg 40,000 B 10,000 kgs @ `6 per kg 60,000 Direct labour (30,000 hours @ `6 per hour) 1,80,000 Variable overheads (30,000 hours @ `4 per direct labour hr) 1,20,000 4,00,000 The actual results are: Direct materials – A 19,000 kgs @ `2.20 per kg 41,800 B 10,100 kgs @ `5.60 per kg 56,560 Direct labour (28,500 hours @ `6.40 per hour) 1,82,400 Variable overheads 1,04,400 3,84,760 Actual production was 9,000 units. From the above information, calculate the following variances and prepare a Variance Report showing reconciliation of standard cost and actual cost. (a) Material price and usage (b) Labour wages rate and labour efficiency (c) Variable overheads (i) Total variable overheads variance (ii) Overheads expenditure variance (iii) Overheads efficiency variance Solution: (a) Material Variances (i) Material Price Variance = (SP – AP) × AQ A = (2 – 2.20) × 19,000 = `3,800 (A) B = (6 – 5.60) × 10,100 = `4,040 (F) MPV = `240 (F)

Standard Costing NOTES Self-Instructional 262 Material (ii) Material Usage Variance = (SQ – AQ) × SP A = (18,000 – 19,000) × 2 = `2,000 (A) B = (9,000 – 10,100) × 6 = `6,600 (A) MUV = `8,600 (A) (iii) Material Cost Variance = MPV + PUV = `240 (F) + `8,600 (A) = `8,360 (A) (b) Labour Variances *9,000 units @ 3 hours per unit = 27,000 standard hours for actual production (SH) (i)

Labour Rate Variance = (SR – AR) × AH = (6 – 6.40) × 28,500 = `11,400 (A) (ii) Labour Efficiency Variance = (SH – AH) × SR = (27,000* – 28,500) × 6 = `9,000 (A) (

iii) Labour Cost Variance = LRV + LEV = 11,400 (A) + 9,000 (A) = `20,400 (A) (c) Variable Overheads Variances Total Variable Overheads Variance = (Std hrs for actual production × Std overhead rate) – Actual variable overheads = (27,000* × 4) – 1,04,000 = `4,000 (F) (i) Overheads Expenditure Variance = (Budgeted overheads – Actual variable overheads) = (28,500 × 4) – 1,04,000 = `10,000 (F) (ii) Overheads Efficiency Variance = (Standard hours for actual production – Actual hours) × Standard overheads rate = (27,000 – 28,500) × 4 = `6,000 (A) Total Cost Variance = Total Std Cost – Total Actual Cost = (9,000 units × `40) – `3,84,760 = `24,760 (A) Variance Report (Reconciliation of Standard Cost and Actual Cost)

Standard Costing NOTES Self-Instructional Material 263 Disposition of Variances When standard costs are not entered in the books of accounts and are used only as a statistical information, no adjustments are required at the end of the period for the variances. However, when standard costs are incorporated into the accounting system through journals and ledgers, there arises a question of adjustment and disposition of variances at the end of the accounting period. There is no uniformity of opinion as to the proper disposition of variances. Therefore, no hard and fast rules can be laid down in this regard. Check Your Progress 4. State the accounting principle which is used when dealing with controllable and uncontrollable variances. 5. Mention the formula for material usage variance. 6. When does labour mix variance arise? 7. Which variance is also known as spending variance or budget

variance? 13.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS 1. In jobbing industries, it is not worthwhile to develop and employ a full system of standard costing because in such industries each job undertaken may be different from another and setting standards for each job may prove difficult and expensive. 2. The three types of current standards are: ideal standards, expected and normal standards. 3. The

transfer of variance between standard cost and actual cost to a variance account ensures uniform pricing of stocks in the form of raw materials, work-in-progress and finished goods. 4. The accounting principle which is used when dealing with controllable and uncontrollable variances is the principle of exception whereby those matters which are going right are ignored and any deviations from efficient performance are investigated. 5.

The following is formula for material usage variance: Material Usage Variance = (Standard quantity for actual output – Actual quantity) × Standard Price 6. Labour

mix variance arises only when more than one grade of workers are employed and the composition of actual grade of workers differs from those specified.

Standard Costing NOTES Self-Instructional 264 Material 7. Fixed overhead expenditure variance is also known as Spending variance or Budget Variance. 13.5

SUMMARY ? Standard costing is a specialized technique of cost management to control the cost. ? The limitations of historical costing encouraged the development of a more satisfactory standard costing approach based on predetermined costs. ? Standard costing is not an alternative system to job order or process costing. It is a special technique to control costs and can be used in conjunction with any other system like job costing, process costing or marginal costing. ? Standard costing system may suffer from certain disadvantages. This may be because of lack of education and communication and resultant misunderstanding on the part of managerial staff. ? Establishing a system of standard costing: establishment of cost centres, classification of accounts, types of standards, and setting of standard costs. ?

Cost variance is the difference between a standard cost and the comparable actual cost incurred during a period. These variances can be favourable or unfavourable and controllable and uncontrollable variances. ? While setting standards, specific methods of production are kept in view. If, for some reason or the other, a different method of production is adopted, it will give rise to a different amount of cost, thereby resulting in a variance. Such a variance is known as methods variance. ? The total cost variance is divided into material, labour and overheads variances. ? The material cost variance is further divided into material price and material usage variances. ? The labour cost variance is divided into labour rate variance and labour efficiency variance. **13.6 KEY WORDS** ? Historical costing: It is a cost accounting concept in which the assets and liabilities are reported at their historical costs, which does not account for changes in the item's value. ? Standard costs: These are predetermined costs or target costs that should be incurred under efficient operating conditions.

Standard

Costing **NOTES Self-Instructional Material 265** ?

Standard hour: It refers to the quantity of output or amount of work which should be performed in one hour. ? Cost variance: It refers to

the difference between a standard cost and the comparable actual cost incurred during a period. **13.7**

SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer Questions 1. Define standard and budgeted costs. 2. Write a short note on the applicability of standard costing. 3. List the limitation of standard costing. 4. What are the different types of variances? Long Answer Questions 1. Explain the steps involved in the establishment of standard costing. 2.

Describe the process of setting standard costs. 3. Discuss the different material and labour variances. 4. From the particulars given below, compute: Material Price Variance, Material Usage Variance, Labour Rate Variance, Idle Time Variance and Labour Efficiency Variance, with full working details. One tonne of materials input yields a standard output of 1,00,000 units. The standard price of material is ` 20 per kg. Number of employees engaged is 200. The standard wage rate per employee per day is ` 6. The standard daily output per employee is 100 units. The actual quantity of material used is 10 tonnes and the actual price paid is ` 21 per kg. Actual output obtained is 9,00,000 units. Actual number of days worked is 50 and actual rate of wages paid is ` 6.50 per day. Idle time paid for and included in above time is 1/2 day. 5. From the following prepare variance analysis of a particular department for a month: Variable

Overheads items: Actual ` Material handling 8,325 Idle Time 850 Rework 825 Overtime premium 250 Supplies 4,000 14,250

Standard Costing **NOTES Self-Instructional 266** Material Fixed Overheads Items: Supervision 1,700 Depreciation of plant 2,000 Depreciation of equipment 5,000 Rates 1,150 Insurance 350 10,200 Normal capacity 10,000 standard hours, budgeted rate ` 1.70 per standard hour for variable overheads and ` 1 per standard hour for fixed overheads. Actual level is 8,000 standard hours. **13.8**

FURTHER READINGS

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Reconciliation of Accounts, Cost Control and Reduction **NOTES Self-Instructional Material 267** **BLOCK - IV RECONCILIATION OF COST AND FINAL ACCOUNT UNIT 14 RECONCILIATION OF ACCOUNTS, COST CONTROL AND REDUCTION** Structure 14.0 Introduction 14.1 Objectives 14.2 Reconciliation of Cost and Final Accounts 14.2.1

Procedure 14.3 Cost Control and Cost Reduction 14.3.1 Distinction between Cost Control and Cost Reduction 14.3.2 Scope and Areas of Cost Reduction 14.3.3 Tools and

Techniques of Cost Reduction and Cost Control and their Advantages 14.3.4 Essentials for the Success

of Cost Control and Cost Reduction 14.3.5 Advantages of Cost Reduction 14.4 Answers to Check Your Progress

Questions 14.5 Summary 14.6 Key Words 14.7 Self Assessment Questions and Exercises 14.8 Further Readings 14.0

INTRODUCTION

When cost accounts and financial accounts are maintained separately in two different sets of books, two profit and loss accounts

will be prepared—one for costing books and the other for financial books. The profit or loss shown by costing books may not agree with that shown by financial books. Therefore, it becomes necessary that profit or loss shown by the two sets of accounts is reconciled. It is important to note that the question of reconciliation of cost financial accounts arises only under non-integral system.

However, under the integral accounts, since cost and financial accounts are integrated into one set of books and only one Profit and Loss Account is prepared, the problem of reconciliation does not arise.

In this unit, you will learn the important aspects of reconciliation of cost and final accounts.

Reconciliation of Accounts, Cost Control and Reduction NOTES Self-Instructional 268 Material

Now-a-days businesses are operating in a globally competitive environment, where in order to increase profits, increase in selling prices of products/services may not be possible because of fears of shrinkage in volumes. Thus in order to improve profit performance, businesses have to be extremely cost conscious and improve their performance in cost. In other words, in this age of competition, in order to survive and improve profitability, managers have to make continuous efforts to find out ways and means to control and reduce costs.

In this unit, you will also learn the important aspects of cost control and cost reduction. 14.1

OBJECTIVES After going through this unit, you will be able to: ? Discuss the concept of reconciliation of cost and

financial accounts ? Describe the procedure of reconciliation of cost and financial accounts ?

Explain the

meaning and essentials of cost control and cost reduction ? Recall the tools and techniques of cost control and cost reduction and their advantages ? Differentiate between cost control and cost reduction ? Explain the areas of cost reduction and control 14.2 RECONCILIATION OF COST AND FINAL ACCOUNTS

The need for reconciliation arises

due to the following reasons: 1.

Reconciliation reveals

the

reasons for

difference in profit or loss between cost and financial

accounts. 2.

It

also helps in checking the arithmetic accuracy of the costing data. In other words, reconciliation enables to test the reliability of cost accounts. 3. It promotes coordination and cooperation between cost accounting and financial accounting departments. Reasons for Disagreement in Profit/Loss

Difference in profit or loss between cost and financial accounts may arise due to the following reasons: 1. Items shown only in financial accounts:

There are a number of items which appear in financial accounts and not in cost accounts. While reconciling, any items under this category must be considered. These items are classified into three categories as under:

Reconciliation of Accounts, Cost Control and Reduction NOTES Self-Instructional Material 269 (

a) Purely financial charges—Examples: (i) Loss on the sale of capital assets (ii) Discount on bonds, debentures, etc. (

iii) Losses on investments (iv) Expenses of company's transfer office (v) Interest on bank loans and mortgages (vi) Fines and penalties (vii) Provision for bad and doubtful debts (viii) Damages payable at law (ix) Amounts written off, goodwill, discount on debentures, preliminary expenses (x) Loss due to theft, pilferage, etc. (b) Purely financial incomes—

Examples: (i) Profit arising from the

sale of capital assets (ii) Rent receivable (iii) Dividend and interest received on investments (iv) Interest received on bank deposits (v) Transfer fees received (

vi) Income tax refund (c) Appropriations of profit—Examples: (i) Dividends paid (ii) Transfer to reserves (iii) Charitable

donations (iv) Income-tax (v) Any other items which appears in Profit and Loss Appropriation Account 2. Items shown only in cost accounts: There are a few items which are included in cost accounts and not in financial accounts.

Examples: (a) Notional rent, i.e., charge in lieu of rent when premises are owned and no rent is payable (b) Interest on capital employed but not actually paid, i.e., the notional cost of employing capital (c) Notional salaries (d) Depreciation

on fully depreciated assets still in use 3. Under-absorption or over-absorption of overheads: In cost accounts, overheads are recovered at a predetermined rate whereas in financial accounts

Reconciliation

of Accounts, Cost Control and Reduction NOTES Self-Instructional 270 Material

these are recorded at actual cost. This may give rise to a difference between overheads absorbed in cost and actual overhead cost incurred. Such differences should be written off to Costing Profit and Loss Account.

However, when under or over-absorbed overheads are not written off to Costing Profit and Loss Account, it results in the amount recovered in cost accounts being different from the actual amount shown in financial accounts. In such a case, it becomes necessary to take into account this under/over-absorption while reconciling the two accounts.

4. Different bases of stock valuation: In cost accounts stocks are valued according to the method adopted in stores accounts, e.g. FIFO, LIFO, etc. On the other hand, valuation of stock in financial accounts is invariably based on the principle of cost or market price, whichever is less. Different stock values result in some difference in profit or loss as shown by the two sets of account books.

5. Different charges for depreciation: The rates and methods of charging depreciation may be different in cost and financial accounts. The financial accounts may follow straight line or diminishing balance method, etc., whereas in cost accounts machine hour rate, production unit method, etc., may be adopted. This will also cause a difference in the profit/loss figures.

14.2.1 Procedure

The cost and financial accounts are reconciled by preparing a Reconciliation Statement or a Memorandum Reconciliation Account. The following procedure is recommended for preparing a Reconciliation Statement:

1. Ascertain the points of difference between cost accounts and financial accounts.
2. Start with the profit as per cost accounts.
3. (a) Regarding items of expenses and losses: Add: Items over-charged in cost accounts Deduct: Items under-charged in cost accounts For example, depreciation in cost accounts is ₹2,500 and that in financial accounts is ₹2,700. This has the effect of increasing costing profit by ₹200 as compared to financial profit. Then in order to reconcile, ₹200 will be deducted from costing profit. (b) Regarding items of incomes and gains: Add: Items under-recorded or not recorded in cost accounts Deduct: Items over-recorded in cost accounts For example, interest on investments received amounting to ₹1,500 is not recorded in cost accounts. This will have the effect of reducing profit as per cost books. Thus, in order to reconcile, this amount of ₹1,500 for interest should be added in the costing profit.

Reconciliation of Accounts, Cost Control and Reduction NOTES Self-Instructional Material 271 (

c) Regarding valuation of stock: (i) Opening Stock— Add: Amount of over-valuation in cost accounts Deduct: Amount of under-valuation in cost accounts (ii) Closing Stock— Add: Amount of under-valuation in cost accounts Deduct: Amount of over-valuation in cost accounts

4. After making all the above additions and deductions in costing profit, the resulting figure shall be the profit as per financial books.

The above treatment of items will be reversed when the starting point in the Reconciliation Statement is the profit as per financial accounts or loss as per cost accounts.

Pro forma of

Reconciliation Statement Profit as per cost accounts ₹ Add: 1. Over-absorption of overheads 2.

Financial incomes not recorded in cost books 3. Items charged only in cost accounts (

Notional rent and interest on capital, etc.) 4.

Over-

valuation of opening stocks in cost books 5. Under-valuation of closing stock in cost books

Less: 1. Under-absorption of overheads 2. Purely financial charges 3. Under-valuation of opening stock in cost books 4. Over-valuation of closing stock in cost books Profit as per financial accounts

Memorandum Reconciliation Account

This is an alternative to Reconciliation Statement. The only difference is that the information shown above in the pro forma reconciliation statement is shown in the form of an account. The profit as per cost accounts is the starting point and is shown on the credit side of this account. All items which are added to costing profit for reconciliation are also shown on credit side. The items to be 'deducted' from costing profit for reconciliation are shown on the debit side. The balance figure is the profit as per financial accounts. It is only a memorandum account and does not form part of the double entry books of account.

Pro forma of Memorandum Reconciliation Account

₹ To (Item to be deducted) — By Profit as per cost accounts — To (Item to be deducted) — By (Item to be added) — To (Item to be deducted) — By (Item to be added) — To (Item to be deducted) — By (Item to be added) — To (Item to be deducted) — By (Item to be added) — To Profit as per financial accounts — By (Item to be added) — (balancing figure)

Reconciliation of Accounts, Cost Control and Reduction NOTES Self-Instructional 272 Material

Example 1:

From

the following figures, prepare a Reconciliation Statement: Net profit as per financial books 63,780

Net profit as per costing

books 66,760

Factory

overheads under-recovered in costing 5,700 Administration overheads recovered in excess 4,250
Depreciation charged in financial books 3,660 Depreciation recovered in costing 3,950 Interest received but not included
in costing 450 Income-tax provided in financial books 600 Bank interest credited in financial books 230 Stores
adjustment (credited in financial books) 420

Depreciation of stock charged in financial
accounts 860 Dividends appropriate in financial accounts 1,200 Loss due to theft
and pilferage

provided only in financial books 260 Solution: Reconciliation Statement Profit as per costing books 66,760 Add: 1.
Adm. overheads recovered in excess 4,250 2. Depreciation overcharged in cost books (3,950 – 3,660) 290 3. Interest
received but not included in costing 450 4. Bank interest credited in financial books only 230 5. Stores adjustment
credited in financial books 420 5,640 72,400 Less: 1. Factory overheads under-recovered 5,700 2. Income tax provided in
financial books 600 3. Dividends appropriated 1,200 4. Depreciation of stock in financial books 860 5. Loss due to theft
and pilferage not shown in cost books 260 8,620 Profit as per financial books 63,780

Check Your Progress 1. Give some examples of purely financial incomes. 2. What

are the ways in which depreciation is charged in financial and cost accounts? 3. What is the alternative to reconciliation
statement? 14.3 COST CONTROL AND COST REDUCTION Cost control is an essential component of any system of cost
accounting. It is exercised through comparing actual costs with predetermined standard costs so that the difference
between the two can be measured and then analysed according to reasons for taking corrective action. CIMA, London
has defined

cost control as,

the regulation by executive action of the cost of operating an undertaking

Reconciliation of Accounts, Cost Control and Reduction NOTES Self-Instructional Material 273 particularly where action
is guided by cost accounting'. Cost control is thus simply the utilization of the available resources economically and
prevention of the wastage within the existing environment. It is the function of keeping costs within the prescribed limits.

Steps in Cost Control: In designing a system of cost control, the following steps are taken: 1. Establishing norms: The first
step in cost control is to set norms or standards which may serve as yardsticks for measuring performance. These
standards or norms are set on the basis of past performance, adjusted for changes in future and on the basis of studies
conducted. 2. Comparison with actual: The actual costs incurred are compared with established standard costs to know
the level of achievement. The variations are analysed so as to arrive at the causes which are controllable and
uncontrollable. 3. Corrective action: Remedial or corrective measures are taken to avoid the recurrence of variations in
future and for revision of standards, wherever necessary. Amongst the techniques used for cost control, the two most
popular are budgetary control and standard costing. Cost Reduction Cost reduction is often confused with cost control.
Cost reduction is much wider in scope and consists of effecting savings in cost by continuous research for improvement
in products, methods, procedures and organizational practices. Cost reduction is defined by CIMA, London as 'the
achievement of

real and permanent reduction in the unit cost of goods manufactured or services rendered without impairing their
suitability for use intended.'

This definition reveals the following characteristics of cost reduction: (

i) Cost reduction must be real—say, through increase in productivity, change in product design and improvement in
technology, etc. (ii) Cost reduction must be permanent—temporary reductions in cost due to windfalls, change in tax
rates and changes in market prices, do not come in the purview of cost reduction. (iii) Cost reduction must not impair
the suitability of products or services for the intended use. In other words, cost reduction should not be at the cost of
essential characteristics of the products or services. The cost reduction is, therefore, the term used for planned and
positive approach to the improvement of efficiency. It can be viewed in many ways, such as increasing productivity,
elimination of waste, improvement in product design, better technology and techniques, incentive schemes, new layouts
and better

Reconciliation of Accounts, Cost Control and Reduction NOTES Self-Instructional 274 Material methods, etc. If the cost
reductions are not based on sound reasons, like improved methods, then very quickly the costs will grow back to their
original size. 14.3.1 Distinction between Cost Control and Cost Reduction Cost control and cost reduction are two
effective tools of cost management to improve efficiency. Cost control and cost reduction are two separate phases of
cost improvement. Cost reduction begins where cost control ends.

The main points of distinction between the two are as follows: 14.3.2

Scope and Areas of Cost Reduction The scope of cost reduction is so wide that it is not practicable to develop fully the areas in which cost reduction may be applied. Wherever costs are incurred, there is scope for their reduction and the management should not feel that there is no room for cost reduction in any particular area. Effort should, therefore, be made to reduce costs right from the top level to the shop floor level. However, in the following areas, scope of cost reduction is the largest: 1. Product design: The design of the product provides the greatest scope for cost reduction. Product design being the first step in production, if cost reduction can be made at design stage, then it is likely that the benefits can be availed to the maximum. There are two basic points that should be kept in mind while effecting cost reduction in product design: (a) The product should perform all the functions for which it is intended; and (b) The product should retain its 'esteem' or 'aesthetic' value. This is in the case of many products which have the shape or other characteristic which pleases the eye. Improvement in product design may result in cost reduction as illustrated below: (i) Material cost: Change in design of the product may result in saving in material cost. Economical substitution for existing material may also be considered. For example, in manufacturing kitchen utensils, brass may be substituted by cheaper alloys. In curtain rings, metal may be substituted by plastic. (ii) Labour cost: Improvement in design may result in reduced operating time. (iii) Factory overheads: Reduced operating time not only helps in saving in labour cost but also in factory overheads. (iv) Packing and transportation: Compact design of a product results in reduced cost of packing and transportation. (v) Cost of tools, jigs and fixtures can be reduced through design improvement. 2. Organization: Cost reduction may also be achieved by improving factory organization in the form of clear-cut lines of authority and responsibility, well-defined channels of communications, co-ordination and co-operation between various executives, etc. 3. Production: A cost reduction programme should make a study of sequence of operations to find out the best one, to use the most suitable machines for the work, to use jigs and fixtures to reduce operating time, to reduce idle time, to reduce scrap by the use of better quality tools, to provide better working conditions conducive to efficiency, etc. 4. Administration: Items under this head include savings effected by modifying the range of cash discounts to customers, introducing mechanical and electronic aids to office routine, modifying internal and external communication system, etc. 5. Marketing: In this function, costs can be reduced by revising the methods of remuneration of salesmen, re-arranging territorial responsibilities of sales representatives, modifying current methods of advertising, improving product design and production quality so as to reduce after sales service, economizing channels of distribution, improving packing, etc. 6. Finance: A cost reduction programme should aim at securing capital at economical cost, employing capital to give maximum return and eliminating over and under capitalization and wasteful use of capital, etc.

Reconciliation of Accounts, Cost Control and Reduction NOTES Self-Instructional 276 Material 14.3.3 Tools and Techniques of Cost Reduction and Cost Control and their Advantages Various tools and technique used for cost reduction include the following: 1. Standard costing 2. Budgetary control 3. Inventory control 4. Production planning and control 5. Standardization and simplification 6. Operational research and statistical techniques 7. Value analysis 8. Automation 9. Design improvement 10. Market research 11. Job evaluation and merit rating 12. Work study 13. Organization and methods study 14. Quality control. 14.3.4 Essentials for the Success of Cost Control and Cost Reduction The following are the essentials which must be considered for the successful operation of a cost control and cost reduction programme: ? The cost reduction programme must align with the type and nature of organization. It should be suitable to its set objectives and available resources. ? It must be remembered, planned and operated as a continuous and not a one-time activity. There must be continuous corrective action in place and newer innovative approaches. ? The cost reduction programme must initiate permanent and real cost cutting and not arbitrary cost slashing. ? Cost reduction programme is heavily dependent on the cooperation of the different teams and members. It should be made acceptable keeping the employees in mind. Examples could be set by initiation from the top executives. ? Innovation in cost reduction must be bred and encouraged. Consequently, employees leading with innovative approaches must be rewarded suitably. ? The cost reduction programme must not be narrow in approach at the risk of only accounting for costs. It must also keep in consideration the social and legal consequences of the implementation of the programme.

Reconciliation of Accounts, Cost Control and Reduction NOTES Self-Instructional Material 277 ? The principle behind a cost reduction programme must be that there is always scope for cost reduction in all organizations. ? It must be ensured that there is no overlapping of cost reduction measures to make sure that there is no double counting. 14.3.5 Advantages of Cost Reduction The following are the advantages of cost reduction programmes: ? It will increase profits and thereby increase the basis for more dividends, bonuses, retention of profit, etc. ? It will encourage the prospects of company expansion. ? It will ensure increased productivity even in cases of limited resources. ? It will assist in meeting competitions in a better manner. ? It will increase government's revenue by the way of taxation. ? It will make goods and services available to consumers at cheaper rates. ? It will help firm think about long term benefits and also improve their image and goodwill. Check Your Progress 4. What is known as the function of keeping costs within prescribed limits? 5. Which of the two is a corrective function: cost control or cost reduction? 6. List the items included in cost reduction in the area of administration. 14.4

ANSWERS TO CHECK YOUR PROGRESS QUESTIONS 1. Some examples of purely financial incomes are profit arising from the sale of capital assets, rent receivable, dividend and interest received on investments, interest received on bank deposits, transfer fees received, and income tax refund. 2.

The financial accounts may follow straight line or diminishing balance method, etc., of charging depreciation,

whereas in cost accounts machine hour rate, production unit method, etc., may be adopted. 3.

Memorandum reconciliation account is the alternative to reconciliation statement. 4. Cost control is known as the function of keeping costs within prescribed limits. 5. Cost reduction is a corrective function.

Reconciliation of Accounts, Cost Control and Reduction NOTES Self-Instructional 278 Material 6. Items under the administration head for cost reduction include savings effected by modifying the range of cash discounts to customers, introducing mechanical and electronic aids to office routine, modifying internal and external communication system, etc. 14.5

SUMMARY ?

When cost accounts and financial accounts are separately maintained in two different sets of books, two profit and loss accounts

will be prepared— one for costing books and the other for financial books. ?

It is important to note that the question of reconciliation of cost financial accounts arises only under non-integral system. ?

However, under the integral accounts, since cost and financial accounts are integrated into one set of books and only one Profit and Loss Account is prepared, the problem of reconciliation does not arise. ?

There are a number of items which appear in financial accounts and not in cost accounts. While reconciling, any items under this category must be considered. ?

In cost accounts overheads are recovered at a predetermined rate whereas in financial accounts these are recorded at actual cost. This may give rise to a difference between overheads absorbed in cost and actual overhead cost incurred.

Such differences should be written off to Costing Profit and Loss Account. ?

In cost accounts stocks are valued according to the method adopted in stores accounts, e.g. FIFO, LIFO etc. On the other hand, valuation of stock in financial accounts is invariably based on the principle of cost or market price, whichever is less. ?

The cost and financial accounts are reconciled by preparing a Reconciliation Statement or a Memorandum Reconciliation Account. ?

Cost control is exercised by comparing actual costs with pre-determined standard costs so that the difference between the two can be measured and then analysed according to reasons for taking corrective action. Cost control is thus simply the function of keeping costs within the prescribed limits. ? Cost reduction is the achievement of real and permanent reduction in the per

unit cost of goods manufactured or services rendered without impairing their suitability for use intended,

say, through increase in productivity, change in product design, improvement in technology, etc. Product design provides the greatest scope for cost reduction. ? Various tools and technique used for cost reduction include the following:

o Standard costing o Budgetary control

Reconciliation of Accounts, Cost Control and Reduction NOTES Self-Instructional Material 279 o Inventory control o Production planning and control o Standardization and simplification o Operational research and statistical techniques o Value analysis o Automation o Design improvement o Market research o Job evaluation and merit rating o Work study o Organization and methods study o Quality control. 14.6 KEY WORDS ?

Financial Accounts: This refers to the type of accounting in which actual transactions of a company are recorded to show the financial position ? Costing Accounts: This refers to the type of accounting in which actual transactions as well as estimation of costs of a company are recorded of accurate decision making ?

Cost Control: It refers to the method of regulation by executive action of the cost of operating an undertaking particularly where action is guided by cost accounting ?

Cost Reduction: It is the achievement of

real and permanent reduction in the unit cost of goods manufactured or services rendered without impairing their suitability for use intended 14.7

SELF ASSESSMENT QUESTIONS AND EXERCISES Short Answer Questions 1. What do you understand by reconciliation of cost and financial accounts? 2.

List out 10 items, either debit or credit, which appear in financial accounts but do not appear in cost accounts. 3.

What is Memorandum Reconciliation Account? 4.

What is cost reduction? Give examples. 5. Distinguish between cost control and cost reduction. Reconciliation of Accounts, Cost Control and Reduction NOTES Self-Instructional 280 Material 6. What are the different techniques and tools of cost control and cost reduction? 7. Write a short note on the essentials for success of cost control and cost reduction. 8. What are the advantages of cost reduction programmes?
Long Answer Questions 1. Indicate

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the reasons why it is necessary for the cost and financial accounts of an organization to be reconciled		

and explain the main reasons of difference which enter into such accounts. 2. The profit disclosed by company's cost accounts for the year was ` 30,114 whilst the net profit shown by the financial accounts amounted to ` 19,760. On reconciling the figures the following differences are brought to light: (a) Overheads in the cost accounts were estimated at ` 7,500. The charge for the year shown by the financial accounts was ` 6,932. (b) Director's fees not charged in the cost accounts amounted to ` 750. (c) The company has allocated ` 600 to general provision for bad debts. (d) Work was commenced during the year on a new factory and expenditure of ` 12,000 was incurred. Depreciation of 5% was provided for in the financial accounts. (e) Transfer fees received amounted to ` 28. (f) The amount charged for Income Tax ` 9,000. Prepare a statement reconciling the figure shown by cost and financial accounts. 14.8

FURTHER READINGS

Arora, M.N. 2012. A Textbook of Cost and Management Accounting, Tenth edition. New Delhi: Vikas Publishing House.
Arora, M.N. 2010. Cost Accounting: Principles and Practice, Eleventh edition. New Delhi: Vikas Publishing House.
Shillinglow, G. 1982. Managerial Costing Accounting. Homewood: Richard D. Irwin. Morse, W. J. 1978. Cost Accounting. Massachusetts: Addison-Wesley Publishing Co. Lal, Jawahar. 2003. Cost Accounting. New Delhi: Tata McGraw Hill.

Hit and source - focused comparison, Side by Side

Submitted text As student entered the text in the submitted document.
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Absorption of Overheads and Its Methods 6.4.1 Types of Overhead Rates 6.5 Administration, Selling and Distribution Overheads 6.6 Under-Absorption and Over-Absorption of Overheads 6.7				
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direct costs and indirect costs on the basis of their identifiability with cost units or jobs or processes or cost centres. Direct costs: These are those costs which				
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These are general costs and are incurred for the benefit of a number of cost				
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the aggregate of indirect material cost, indirect labour cost and indirect expenses. ?

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Absorption of Overheads and Its Methods 6.4.1 Types of Overhead Rates 6.5 Administration, Selling and Distribution Overheads 6.6 Under-Absorption and Over-Absorption of Overheads 6.7

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Variable overheads per unit remain fixed. Examples are indirect materials, indirect labour, salesmen's commission, power,

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Preparation of budgets: This classification helps in the preparation of budgets. For instance, when flexible budgets are prepared for different levels

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fixed cost remains constant at all levels of activity, whereas variable cost varies according to the actual level of

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segregation of cost into fixed and variable. 5. Absorption of overheads: By classifying costs into fixed and variable, separate rates of absorption of overheads may be used for fixed and variable overheads. The under/over-absorption arising out of two types of overheads are different in nature and need different managerial action.

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High and Low Points Method Under this method, semi-variable costs at various level of output are considered
The difference between the highest and the lowest volume of

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semi-variable costs incurred at levels of output are plotted on a graph, the X-axis

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this method, overhead costs are segregated by means of an equation. This equation for a straight line is: $Y = mX + c$ where $Y =$ Total semi-variable cost $X =$ Volume of output $c =$ Fixed cost

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as follows: 1. Classification and collection of overheads 2. Allocation and apportionment of overheads to production departments and servicedepartments 3. Re-apportionment of service department costs to production departments 4. Absorption of overheads of

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14/95	SUBMITTED TEXT	56 WORDS	60% MATCHING TEXT	56 WORDS
<p>Similarly, power house supplies electricity not only to production departments but also to service departments like canteen, maintenance departments, etc. This type of inter-service department apportionment may be either on reciprocal basis or non-reciprocal basis. Apportionment on non-reciprocal basis (Stepladder Method): This method is used when a service department renders services to other service departments but does not receive services of the</p>				
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15/95	SUBMITTED TEXT	25 WORDS	94% MATCHING TEXT	25 WORDS
<p>This means a service department not only provides its services to other service departments but also receives services of other service departments. For example, boiler house</p>				
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16/95	SUBMITTED TEXT	13 WORDS	87% MATCHING TEXT	13 WORDS
<p>reciprocal basis: 1. Simultaneous Equations Method 2. Repeated Distribution Method 3. Trial and Error Method</p>				
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17/95	SUBMITTED TEXT	19 WORDS	100% MATCHING TEXT	19 WORDS
<p>Illustration 6.2: A company has three production departments and two service departments. Distribution summary of overheads is as follows:</p>				
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18/95	SUBMITTED TEXT	22 WORDS	78% MATCHING TEXT	22 WORDS
<p>Production Departments Service Departments A ` 3,000 1 `234 B `2,000 2 `300 C `1,000 The expenses of service departments are charged on a percentage basis which</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

19/95	SUBMITTED TEXT	64 WORDS	93% MATCHING TEXT	64 WORDS
<p>as follows: A B C 1 2 1. 20% 40% 30% – 10% 2. 40% 20% 20% 20% – Find out the total overheads of production departments using the following methods: (a) Simultaneous Equations Method (b) Repeated Distribution Method Solution: (a) Simultaneous Equations Method Let x denote total overheads of service department 1 y denote total overheads of service department 2 Therefore, $x = 234 + 0.2y$... (i) $y = 300 + 0.1x$... (ii) To solve the equations,</p>				
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20/95	SUBMITTED TEXT	83 WORDS	74% MATCHING TEXT	83 WORDS
<p>these and multiply by 10 to eliminate decimals. $10x - 2y$ $= 2,340$... (i) $-x + 10y = 3,000$... (ii) Multiplying second equation by 10 and adding $10x - 2y = 2,340 - 10x + 100y$ $= 30,000$ $98y = 32,340$ $y = 32,340 \div 98$ $y = 330$; and $x =$ 300 Secondary Distribution Summary Total Production Departments A B C ` ` ` ` Total as per primary summary 6,000 3,000 2,000 1,000 Service Deptt 1 (90% of 300) 270 60 120 90 Service Deptt 2 (80% of 330) 264 132 66 66 Total 6,534 3,192 2,186 1,156</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

21/95	SUBMITTED TEXT	26 WORDS	65% MATCHING TEXT	26 WORDS
<p>b) Repeated Distribution Method Items Production Deptts Service Deptts A B C X Y ` ` ` ` ` ` Total as per primary summary 3,000 2,000 1,000 234 300 Service</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

22/95	SUBMITTED TEXT	21 WORDS	100% MATCHING TEXT	21 WORDS
<p>machine hour rate: When the direct wages of machine operators are included in machine hour rate, it is known as comprehensive machine</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

23/95	SUBMITTED TEXT	13 WORDS	75% MATCHING TEXT	13 WORDS
<p>comprehensive machine hour rate, overheads and direct wages are absorbed by a single rate.</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
24/95	SUBMITTED TEXT	22 WORDS	60% MATCHING TEXT	22 WORDS
<p>the production department of a factory for the month of June. Material used `80,000 Direct wages `72,000 Direct labour hours worked 20,000 Hours of machine operation 25,000</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
25/95	SUBMITTED TEXT	12 WORDS	100% MATCHING TEXT	12 WORDS
<p>absorption rate may be based on actual figures or estimated figures. Actual</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
26/95	SUBMITTED TEXT	13 WORDS	83% MATCHING TEXT	13 WORDS
<p>Actual rate cannot be computed until the end of the accounting period.</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
27/95	SUBMITTED TEXT	14 WORDS	100% MATCHING TEXT	14 WORDS
<p>is determined in advance of the period in which it is to be used.</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
28/95	SUBMITTED TEXT	13 WORDS	100% MATCHING TEXT	13 WORDS
<p>rate enables prompt preparation of tenders and quotations and fixation of selling prices.</p>				
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29/95	SUBMITTED TEXT	15 WORDS	75% MATCHING TEXT	15 WORDS
<p>Cost control is also facilitated by comparing the actual overheads with the predetermined overheads recovered. The</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

30/95	SUBMITTED TEXT	17 WORDS	75% MATCHING TEXT	17 WORDS
<p>A blanket overhead rate is a single overhead rate for the entire factory. It is computed as follows.</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

31/95	SUBMITTED TEXT	19 WORDS	92% MATCHING TEXT	19 WORDS
<p>rate is used, performance of individual departments or cost centres cannot be properly assessed and exercise of control becomes difficult.</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

32/95	SUBMITTED TEXT	19 WORDS	92% MATCHING TEXT	19 WORDS
<p>rate is used, performance of individual departments or cost centres cannot be properly assessed and exercise of control becomes difficult. 3.</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

33/95	SUBMITTED TEXT	17 WORDS	100% MATCHING TEXT	17 WORDS
<p>which can be achieved only under perfect conditions, i.e., when there is no loss of operating time.</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

34/95	SUBMITTED TEXT	20 WORDS	100% MATCHING TEXT	20 WORDS
<p>As production and sales cannot function without some sort of administrative control, these overheads serve the purpose of such a control.</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

35/95	SUBMITTED TEXT	15 WORDS	93% MATCHING TEXT	15 WORDS
<p>off to Costing Profit and Loss Account: This method is used when the under or over-</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
36/95	SUBMITTED TEXT	16 WORDS	97% MATCHING TEXT	16 WORDS
<p>normal business cycle extends over more than one year and overheads are determined on a long-term basis.</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
37/95	SUBMITTED TEXT	19 WORDS	97% MATCHING TEXT	19 WORDS
<p>What are the main features of job costing? Describe briefly the procedure of recording costs under job order costing. 2.</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
38/95	SUBMITTED TEXT	13 WORDS	76% MATCHING TEXT	13 WORDS
<p>costing) is a method of cost ascertainment which is used in those industries</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
39/95	SUBMITTED TEXT	13 WORDS	66% MATCHING TEXT	13 WORDS
<p>three types: (a) Stocks of raw materials (b) Stocks of work-in-progress (c) Stocks of finished goods</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
40/95	SUBMITTED TEXT	28 WORDS	58% MATCHING TEXT	28 WORDS
<p>cost sheet. Cost Sheet for the period..... Production.....units. Particulars Total cost Cost per unit ` ` Opening stock of raw materials XXX Add: Purchases XXX Add: Expenses on purchases XXX XXX Less: Closing stock of raw</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

41/95 **SUBMITTED TEXT** 147 WORDS **94% MATCHING TEXT** 147 WORDS

The following particulars have been extracted from the books of J K Production Co. Ltd, for the year ended 31 March 2010. ` Stock of materials as on 1 April 2009 47,000 Stock of materials as on 31 March 2010 45,000 Materials purchased 2,08,000 Drawing office salaries 9,600 Counting house salaries 14,000 Carriage inwards 8,200 Carriage outwards 5,100 Donations to relief fund 4,300 Sales 4,87,000 Bad debts written off 4,700 Repairs of plant, machinery and tools 8,600 Rent, rates, taxes and insurance (factory) 3,000 Rent, rates, taxes and insurance (office) 1,000 Travelling expenses 3,700 Travelling salaries and commission 7,800 Production wages 1,45,000 Depreciation written off on machinery, plant and tools 9,100 Depreciation written off on office furniture 600 Director's fees 6,000 Gas and water charges (factory) 1,000 Gas and water charges (office) 300 General charges 5,000 Manager's salary 18,000 Out of 48 working hours in a week, the time devoted by the manager to the factory and office was on an average 30 hours and 18 hours, respectively, throughout the accounting year. Prepare a

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42/95 **SUBMITTED TEXT** 15 WORDS **71% MATCHING TEXT** 15 WORDS

is presented in the form of a T-shape account, it is known as Production Account.

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43/95 **SUBMITTED TEXT** 16 WORDS **71% MATCHING TEXT** 16 WORDS

is presented in the form of a T- shape account, it is known as production account.

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44/95 **SUBMITTED TEXT** 13 WORDS **76% MATCHING TEXT** 13 WORDS

costing is a method of cost ascertainment, which is used in those industries

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45/95 **SUBMITTED TEXT** 12 WORDS **100% MATCHING TEXT** 12 WORDS

What is a cost sheet? Explain the purposes served by it. 3.

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46/95 **SUBMITTED TEXT** 33 WORDS **38% MATCHING TEXT** 33 WORDS

Process C Account Particulars Units ` Particulars Units `
To Process B 9,100 27,300 By Normal wastage 728 728
(transfer) 8% of 9,100) To Sundry materials 500 By
Abnormal wastage 272 1156* To Labour 6,500 By
Finished goods

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47/95 **SUBMITTED TEXT** 16 WORDS **82% MATCHING TEXT** 16 WORDS

Abnormal Gain Account Particulars Units ` Particulars
Units ` To Normal wastage A/c 75 38 By Process

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48/95 **SUBMITTED TEXT** 21 WORDS **93% MATCHING TEXT** 21 WORDS

Next Process Sometimes the output of a process may be partly sold and partly transferred to the next process for further processing.

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49/95 **SUBMITTED TEXT** 46 WORDS **94% MATCHING TEXT** 46 WORDS

part of the output so sold will contain an element of profit or loss which will be revealed in the Process Account. But when a part of the output is sent to warehouse for sale, it is at cost and does not contain an element of profit or loss.

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50/95 **SUBMITTED TEXT** 27 WORDS **100% MATCHING TEXT** 27 WORDS

For example, if there are 50 units in work-in-progress and these are estimated to be 60% complete, then their equivalent production is $50 \text{ units} \times 60\% = 30 \text{ units}$.

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51/95 **SUBMITTED TEXT** 13 WORDS **96% MATCHING TEXT** 13 WORDS

is deducted to obtain equivalent production. When there is opening as well as closing

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52/95	SUBMITTED TEXT	11 WORDS	100% MATCHING TEXT	11 WORDS
<p>Contract account is debited with the cost of the plant</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
53/95	SUBMITTED TEXT	12 WORDS	89% MATCHING TEXT	12 WORDS
<p>Sub-contracts Work of specialized character, for which facilities are not internally available, is</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
54/95	SUBMITTED TEXT	12 WORDS	76% MATCHING TEXT	12 WORDS
<p>main contractor. The cost of such work is charged to the contract account.</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
55/95	SUBMITTED TEXT	19 WORDS	73% MATCHING TEXT	19 WORDS
<p>on the completion of the contract. But in case of large contracts, it may take more than one year</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
56/95	SUBMITTED TEXT	16 WORDS	80% MATCHING TEXT	16 WORDS
<p>Work Uncertified When the contract is not completed till the end of the accounting year, the</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
57/95	SUBMITTED TEXT	22 WORDS	48% MATCHING TEXT	22 WORDS
<p>classified into work certified and work uncertified. Work Certified: This is that part of the work-in-progress which has been approved by the contractee's architect</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
58/95	SUBMITTED TEXT	12 WORDS	100% MATCHING TEXT	12 WORDS
<p>is valued at cost and thus does not include an element of profit.</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

59/95 **SUBMITTED TEXT** 13 WORDS **76% MATCHING TEXT** 13 WORDS

additions or alterations in the work originally done as per agreement. The contractor

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60/95 **SUBMITTED TEXT** 14 WORDS **84% MATCHING TEXT** 14 WORDS

for such extra work. The cost of such extra work is debited to

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61/95 **SUBMITTED TEXT** 25 WORDS **61% MATCHING TEXT** 25 WORDS

work certified is 1/2 or more but less than 9/10 of the contract price, (i.e. 50% to 90%), then the profit to be transferred to

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62/95 **SUBMITTED TEXT** 21 WORDS **45% MATCHING TEXT** 21 WORDS

in the books of Raja Construction Ltd. (ii) Show all possible figures that can be reasonably credited to Profit and Loss Account

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63/95 **SUBMITTED TEXT** 12 WORDS **95% MATCHING TEXT** 12 WORDS

of this clause is to safeguard the interest of the contractor

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64/95 **SUBMITTED TEXT** 20 WORDS **100% MATCHING TEXT** 20 WORDS

clause is of particular importance where prices of material and labour are anticipated to increase or where quantity of material

SA Cost Accounting, Study Material- new.pdf (D44082039)

65/95	SUBMITTED TEXT	14 WORDS	73% MATCHING TEXT	14 WORDS
<p>appear in the balance sheet of the year. Solution: Contract Account for the year ending 31</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
66/95	SUBMITTED TEXT	13 WORDS	100% MATCHING TEXT	13 WORDS
<p>is valued at cost and thus does not include an element of profit.</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
67/95	SUBMITTED TEXT	16 WORDS	65% MATCHING TEXT	16 WORDS
<p>the contract. 4. The object of the escalation clause is to safeguard the interest of the contractor</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
68/95	SUBMITTED TEXT	15 WORDS	100% MATCHING TEXT	15 WORDS
<p>What is a cost-plus contract? Discuss this from the point of view of (a)</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
69/95	SUBMITTED TEXT	106 WORDS	57% MATCHING TEXT	106 WORDS
<p>Thekedar accepted a contract for the construction of a building for ` 10,00,000; the contractee agreeing to pay 90% of work certified as complete by the architect. During the first year, the amounts spent were: Material ` 1,20,000 Machinery ` 30,000 Labour ` 1,50,000 Other expenses ` 90,000 At the end of the year, the machinery was</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
70/95	SUBMITTED TEXT	57 WORDS	87% MATCHING TEXT	57 WORDS
<p>and materials at site were of the value of ` 5000. Work certified during the year totalled ` 4,00,000. In addition, work-in-progress but not certified at the end of year had cost ` 15,000. Prepare Contract Account in the books of Thekedar. Also show the various figures of profit that can be transferred reasonably to the Profit and Loss Account 10.8</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

71/95	SUBMITTED TEXT	16 WORDS	66% MATCHING TEXT	16 WORDS
<p>OPERATING COSTING Operating costing is a method of cost ascertainment used in those undertakings which are engaged in</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

72/95	SUBMITTED TEXT	25 WORDS	88% MATCHING TEXT	25 WORDS
<p>that form of operation costing which applies where standardized services are rendered either by an undertaking or by a service cost centre within an undertaking. Operating costing</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

73/95	SUBMITTED TEXT	11 WORDS	100% MATCHING TEXT	11 WORDS
<p>should not be confused with operation costing. While operating costing is</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

74/95	SUBMITTED TEXT	13 WORDS	92% MATCHING TEXT	13 WORDS
<p>operation costing is a refinement and more detailed application of process costing. Operating Costing</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

75/95	SUBMITTED TEXT	12 WORDS	100% MATCHING TEXT	12 WORDS
<p>capital is invested in fixed assets and comparatively less working capital is required. (</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

76/95	SUBMITTED TEXT	17 WORDS	100% MATCHING TEXT	17 WORDS
<p>To fix the rates of carriage of goods or passengers on the basis of operating costs. 2. To</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

77/95	SUBMITTED TEXT	11 WORDS	84% MATCHING TEXT	11 WORDS
<p>composite cost units may be computed in two ways: (a) Absolute tonne-km (</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

78/95	SUBMITTED TEXT	66 WORDS	90% MATCHING TEXT	66 WORDS
<p>whole and it is arrived at by multiplying the total distance in kms by average load quantity. Illustration 11.1: A truck starts with a load of 10 tonnes of goods from station P. It unloads 4 tonnes at station Q and rest of the goods at station R. It reaches back directly to station P after getting reloaded with 8 tonnes of goods at station R. The distances between P</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

79/95	SUBMITTED TEXT	77 WORDS	74% MATCHING TEXT	77 WORDS
<p>Q, Q to R and then from R to P are 40 kms, 60 kms and 80 kms, respectively. Compute absolute tonne-kms and commercial tonne-kms. (CA Inter) Solution: Absolute tonne-km = (40 kms × 10 tonnes) + (60 kms × 6 tonnes) + (80 kms × 8 tonnes) = 400 + 360 + 640 = 1,400 tonne-kms Commercial tonne-km = Average load × total km = 10 6 8 3 ? ? ? ? ? ? ? ? tonnes × 180 kms = 8 tonnes × 180 km = 1,440 tonne-kms</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

80/95	SUBMITTED TEXT	21 WORDS	59% MATCHING TEXT	21 WORDS
<p>transport costing are obtained from log sheet. A log sheet is maintained for each vehicle to record details of trips, running time,</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

81/95	SUBMITTED TEXT	17 WORDS	100% MATCHING TEXT	17 WORDS
<p>capacity and to guard against unnecessary duplication of trips. A specimen of a log sheet is given</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

82/95	SUBMITTED TEXT	17 WORDS	91% MATCHING TEXT	17 WORDS
<p>charges. 2. Running or variable charges: These costs are those which vary in direct proportion to mileage run</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
83/95	SUBMITTED TEXT	65 WORDS	79% MATCHING TEXT	65 WORDS
<p>Union Transport Company supplies the following details in respect of a truck of 5-tonne capacity: Cost of truck `90,000 Estimated life 10 years Diesel, oil, grease `15 per trip each way Repairs and maintenance `500 per month Cleaner's wages `250 per month Driver's wages `500 per month Insurance `4,800 per year Tax `2,400 per year General supervision charges `4,800 per year The truck carries goods to and from city covering a distance of 50 miles each way.</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
84/95	SUBMITTED TEXT	31 WORDS	96% MATCHING TEXT	31 WORDS
<p>freight is available to the extent of full capacity and on return 20% of capacity. Assuming that the truck runs on an average 25 days a month, work out: (i) Operating cost per tonne-</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
85/95	SUBMITTED TEXT	16 WORDS	78% MATCHING TEXT	16 WORDS
<p>per trip that the company should charge if profit of 50% on freightage is to be earned.</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
86/95	SUBMITTED TEXT	21 WORDS	84% MATCHING TEXT	21 WORDS
<p>the trip is considered as a whole and is arrived at by multiplying the total distance in kms by average load quantity. 11.4</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				
87/95	SUBMITTED TEXT	13 WORDS	100% MATCHING TEXT	13 WORDS
<p>Operating costing should not be confused with operation costing. While operating costing is</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

88/95	SUBMITTED TEXT	14 WORDS	89%	MATCHING TEXT	14 WORDS
<p>operation costing is a refinement and more detailed application of process costing. 2. Examples of</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>					
89/95	SUBMITTED TEXT	17 WORDS	91%	MATCHING TEXT	17 WORDS
<p>whole and it is arrived at by multiplying the total distance in kms by average load quantity. 11.5</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>					
90/95	SUBMITTED TEXT	15 WORDS	73%	MATCHING TEXT	15 WORDS
<p>costing is a method of cost ascertainment used in those undertaking which are engaged in</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>					
91/95	SUBMITTED TEXT	12 WORDS	84%	MATCHING TEXT	12 WORDS
<p>composite cost units may be computed in two ways: (a) Absolute tonne-km</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>					
92/95	SUBMITTED TEXT	21 WORDS	59%	MATCHING TEXT	21 WORDS
<p>transport costing are obtained from log sheet. A log sheet is maintained for each vehicle to record details of trips, running time,</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>					
93/95	SUBMITTED TEXT	15 WORDS	70%	MATCHING TEXT	15 WORDS
<p>a log sheet is maintained for each vehicle to record details of trips, running time,</p> <p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>					

94/95	SUBMITTED TEXT	13 WORDS	76% MATCHING TEXT	13 WORDS
<p>is the aggregate of indirect materials, indirect labour and indirect expenses. Analysis of</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				

95/95	SUBMITTED TEXT	18 WORDS	100% MATCHING TEXT	18 WORDS
<p>the reasons why it is necessary for the cost and financial accounts of an organization to be reconciled</p>				
<p>SA Cost Accounting, Study Material- new.pdf (D44082039)</p>				