1

UNIFORM COSTING AND INTER FIRM COMPARISON

Unit Structure

1.1 UNIFORM COSTING MEANING

Uniform Costing is not a distinct method of costing. In fact, when several undertakings start using the same costing principles and/or practices they are said to be following uniform costing. The basic idea behind uniform costing is that the different concerns in an industry should adopt a common method of costing and apply uniformly the same principles and techniques for better cost comparison and common good. The principles and methods of compilation, analysis, apportionment and absorption of overheads differ from one concern to the other in the same industry; but if a common or uniform pattern is adopted by all, it helps mutually in cost control and cost reduction. Therefore, it is necessary that a uniform method of costing should be adopted by the member unit of an industry.

1.2 OBJECTIVES OF UNIFORM COSTING

The main objectives of Uniform Costing are as follows: —

1. *Facilitates Comparison:* To facilitate the comparison of costs and performances of different units in the same industry; it provides objective basis.

2. *Eliminates Unhealthy Competition:* To eliminate unhealthy competition among the different units of an industry.

3. *Improves Efficiency:* To improve production capacity level and labour efficiency by comparing the production costs of different units with each other.

4. *Provides Relevant Data:* To provide relevant cost information/data to the Government for fixing and regulating prices of the products.

5. *Ensures Standardisation:* To bring standardisation and uniformity in the operation of participating units.

6. *Reduces Cost:* To reduce production, administration, selling and distribution costs, and to exercise control on fixed costs.

Advanced Management Account

Essential requisites for the installation of Uniform Costing System : A successful system of uniform costing has the following requirements :—

1. The firms in the industry should be willing to share/furnish relevant data/information.

2. A spirit of cooperation and mutual trust should prevail among the participating firms.

3. Mutual exchange of ideas, methods used, special achievements made, research and know how etc. should be frequent.

4. Bigger firms should take the lead towards sharing their experience and know-how with the smaller firms to enable the latter to improve their performance.

5. Uniformity must be established with regard to several points before the introduction of uniform costing in an industry. In fact, uniformity should be with regard to following points:

   (a) Size of the various units covered by uniform costing.

   (b) Production methods.

   (c) Accounting methods, principles and procedures used.

1.3 ADVANTAGES OF UNIFORM COSTING

The advantages accruing from the use of uniform costing system are as follows: -

1. The management of each firm will be saved from the exercise of developing and introducing a costing system of its own.

2. A costing system devised by mutual consultation and after considering the difficulties and circumstances prevailing in different firms is readily adopted and successfully implemented.

3. It facilitates comparison of cost figures of various firms to enable the firms to identify their weak and strong points besides controlling costs.

4. Optimum achievement of efficiency is attempted by all the firms by utilising the experience of other concerns in the industry.

5. Standing in the industry of each firm will be known by making a comparison of its cost data with others.

6. Services of cost consultants or experts may be available jointly to each firm in the industry by sharing their experiences and expenses.

7. Research and development benefits of bigger firms may be made available to smaller firms.

8. It helps in the reduction of labour turnover, as a uniform wage system is the pre-condition of a uniform costing system.

9. It helps Trade Associations in negotiating with the Government for any assistance or concession in the matters of taxation, exports, subsidies, duties and prices determination etc.

10. Unhealthy competition is avoided among the firms in the same industry in framing pricing policies and submitting tenders.

11. Prices fixed on the basis of uniform costing are representative of the whole industry and thus are reliable.

12. Uniform costing provide a basis for the comparative assessment of the performance of two firms in the same industry but in different sectors.

13. It helps the Government in regulating the prices of essential commodities such as bread, sugar, cement, steel etc.

1.4 LIMITATIONS OF UNIFORM COSTING

1. Sometimes it is not possible to adopt uniform standards, methods and procedures of costing in different firms due to differing circumstances in which they operate. Hence, the adoption of uniform costing becomes difficult in such firms.

2. Disclosure of cost information and other data is an essential requirement of a uniform costing system. Many firms do not wish to share such information with their competitors in the same industry.

3. Small firms in an industry believe that uniform costing system is only meant for big and medium size firms, because they cannot afford it.

4. It induces monopolistic trend in the business, due to which prices may be increased artificially and supplies withheld.

1.5 INTER-FIRM COMPARISON MEANING

It is technique of evaluating the performance, efficiency, costs and profits of firms in an industry. It consists of voluntary exchange of information/data concerning costs, prices, profits, productivity and overall efficiency among firms engaged in similar type of operations for the purpose of bringing improvement in efficiency and indicating the weaknesses. Such a comparison will be possible where uniform costing is in operation.

An inter-firm comparison indicates the efficiency of production and selling, adequacy of profits, weak spots in the organisation, etc. and thus demands

from the firm's management an immediate suitable action. Inter-firm comparison may enable the management to challenge the standards which it has set for itself and to improve upon them in the light of the current information gathered from more efficient units. Such a comparison may be carried out in electrical industry, printing firms, cotton spinning firms, pharmaceuticals, cycle manufacturing, etc.

1.6 REQUISITES OF INTER-FIRM COMPARISON SYSTEM

The following requisites should be considered while installing a system of inter-firm comparison :–

1. *Centre for Inter-Comparison:* For collection and analysing data received from member units, for doing a comparative study and for dissemination of the results of study a Central body is necessary. The functions of such a body may be :–
   (a) Collection of data and information from its members;
   (b) Dissemination of results to its members;
   (c) Undertaking research and development for common and individual benefit of its members;
   (d) Organising training programmes and publishing magazines.
2. *Membership*: Another requirement for the success of inter-firm comparison is that the firms of different sizes should become members of the Centre entrusted with the task of carrying out inter-firm comparison.
3. *Nature of information to be collected*: Although there is no limit to information, yet the following information useful to the management is in general collected by the Centre for inter-firm comparison.
   a. Information regarding costs and cost structures.
   b. Raw material consumption.
   c. Stock of raw material, wastage of materials, etc.
   d. Labour efficiency and labour utilisation.
   e. Machine utilisation and machine efficiency.
   f. Capital employed and Return on capital.
   g. Liquidity of the organisation.
   h. Reserve and appropriation of profit.
   i. Creditors and debtors.
   j. Methods of production and technical aspects.
4. *Method of Collection and presentation of information*: The Centre collects information at fixed intervals in a prescribed form from its

members. Sometimes a questionnaire is sent to each member ; the replies of the questionnaire received by the Centre constitute the information/data. The information supplied by firms is generally in the form of ratios and not in absolute figures. The information collected as above is stored and presented to its members in the form of a report. Such reports are not made available to non-members.

1.7 ADVANTAGES OF INTER-FIRM COMPARISON

The main advantages of inter-firm comparison are :–

1. Such a comparison gives an overall view of the industry as a whole to its members– the present position of the industry, progress made during the past and the future of the industry

2. It helps a concern in knowing its strengths or weaknesses in relation to others so that remedial measures may be taken.

3. It ensures an unbiased specialized reporting on particular problems of the concern.

4. It develops cost consciousness among members of the industry.

5. It helps Government in effecting price regulation.

6. It helps to improve the quality of products manufactured and to reduce the cost of production. It is thus advantageous to the industry as well as to the society.

1.8 LIMITATIONS OF INTER-FIRM COMPARISON

The following are the limitations in the implementation of a scheme of inter-firm comparison :

1. Top management feels that secrecy will be lost.

2. Middle management is usually not convinced with the utility of such a comparison.

3. In the absence of a suitable Cost Accounting System, the figures supplied may not be reliable for the purpose of comparison.

4. Suitable basis for comparison may not be available.

SUMMARY

- When several undertakings start using the same costing principles and/or practices they are said to be following uniform costing.

- The main objectives of Uniform Costing are as follows :

  ✓ *Facilitates Comparison*

- ✓ *Eliminates Unhealthy Competition*
- ✓ *Improves Efficiency*
- ✓ *Provides Relevant Data*
- ✓ *Ensures Standardisation*
- ✓ *Reduces Cost*

- It is technique of evaluating the performance, efficiency, costs and profits of firms in an industry

  An inter-firm comparison indicates the efficiency of production and selling, adequacy of proof- its, weak spots in the organisation, etc. and thus demands from the firm's management an immediate suitable action

- Requisites of inter-firm comparison system are as follows:
  - ✓ *Centre for Inter-Comparison*
  - ✓ *Membership*
  - ✓ *Nature of information to be collected*
  - ✓ *Method of Collection and presentation of information*

MULTIPLE CHOICE QUESTIONS

1. The use by several undertakings of the same costing principles and/or practices._____,

   (a) Unit costing (b) Uniform costing
   (c) Standard costing (d) Differential costing.

2. Uniform Costing helps an individual firm in_____,

   (a) Ascertainment of cost **(b) Cost control and cost reduction**

   (c) Allocation of costs (d) apportionment of costs

3. Inter-firm comparison is one of the aims of_____,

   (a) Unit costing **(b) Uniform costing**
   (c) Standard costing (d) Marginal costing

4. Inter-firm comparison is_____,

   (a) A method of costing (b) A method of allocation of overheads

   (c) A technique of evaluating the performance of firms in an industry

   (d) Related to marginal costing

SELF-EXAMINATION QUESTIONS

1. Define Uniform costing. Explain its objectives.
2. What are the requisites for the installation of a Uniform Costing System?
3. What are the advantages of Uniform Costing ? State its limitations.
4. Enumerate the points on which uniformity is essential before introducing Uniform costing system.
5. What to you mean by inter-firm comparison ? Give its advantages and limitations.
6. Describe the requisites to be considered while installing a system of inter-firm comparison by an industry.

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2

INTEGRATED SYSTEM OF ACCOUNTS

Unit Structure

2.0 OBJECTIVES

After studying this unit, the learner will be able to –

- Understand the concept of Integrated system of accounts, its features, Advantages & Disadvantages.
- Able to solve the practical problems.
- Identify ledgers maintained under integrated system
- Able to understand the journal entries for accounting purpose.

2.1 INTRODUCTION

Under integral accounting system, only one set of books of accounts is prepared and the accounts are written in such a manner that due justice is done to all the Cost Accounting and financial Accounting principles. The accounts to be opened would depend on ultimate outcome expected and ultimate outcome of integral accounting system is the cost sheet for cost accountant and profit and loss A/c and balance sheet for financial accountant.

2.2 MEANING

Integrated accounting is a type of software that combines major financial accounting functions into one application.

Business activities such as payroll, HR paperwork, business operations, and even meeting deliverables can often incur significant expenses.

Comprehensive information on such costs is accessible in the integrated accounting format.

However, this method may not suit businesses that manage data related to cost transactions or expenses and financial data separately. With this method, records for control accounts, including work carried out or in progress, completed tasks, etc., are maintained in a general ledger book.

2.3 FEATURES

An integrated accounting system can include the following **Basic features:**

1. There is no need for cost ledger because all control accounts are maintained in the financial ledger
2. Maintenance of a single set of books for recording expenses, orders, or other operational and financial purposes
3. Reduce the chance of errors
4. Complete analysis of cost and sales are kept.
5. Complete details of all payments in cash are kept
6. Complete details of all assets and liabilities are kept and this system doesnot use a notional account to represent all impersonal accounts
7. Generate accurate profitability reports.
8. Recover more reimbursable expenses.
9. Accounting for expenses is carried out during the cost period rather than the final account period.

2.4 ADVANTAGES AND DISADVANTAGES

Advantages

1. There is no need for reconciliation because there will be only one figure of profit or loss as there is only one set of books.
2. This system is economical because it avoids duplication of recording the transactions in two separate set of books.
3. Accounting information is readily available and the correctness of the data is automatically checked.
4. It enables the introduction of mechanized accounting
5. It is economical also as it is based on the concept of "Centralization of Accounting function".
6. No delay is caused in obtaining information as it isprovided from books of original entry.

7. Due to use of one set of books, there is a significant saving in efforts made.

8. A better understanding among the staff

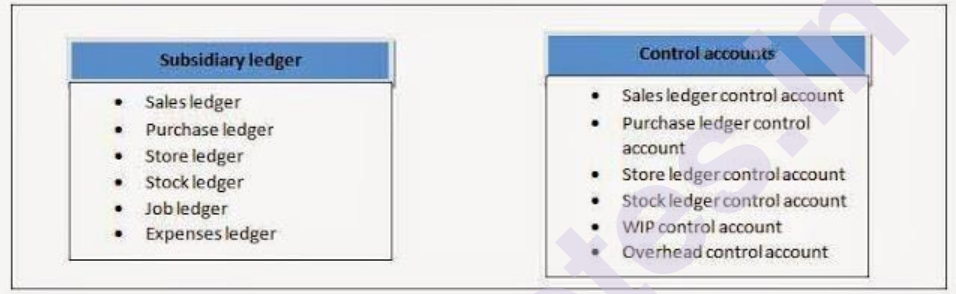
Disadvantages

1. The accounting system is sophisticated and requires efficient and trained staff.

2. Not suitable if cost and financial data are required to be separately presented

3. This accounting system is complicated and costly.

2.5 JOURNAL ENTRIES AND PREPARING INTEGRATED LEDGERS



2.6 DIFFERENCE BETWEEN NON-INTEGRATED ACCOUNTING AND INTEGRATED ACCOUNTING

Bases of difference	Non-integrated accounting	Integrated accounting
accounts	Under it, separate accounts are maintained for cost and financial transactions.	Under it, separate accounts are not maintained for cost and financial transactions.
Cost account	The recording of various costs are maintained difference cost ledgers.	Difference subsidiary ledgers are prepared for maintaining the records of the transactions.
dependency	It is independent system of accounting.	Under this, the cost and financial accounts are dependent to each other.
reconciliation	Under it, it is necessary to prepare a reconciliation statement to reconcile the profit between the cost and financial accounting.	Under it, it is not necessary to prepare a reconciliation statement to reconcile the profit between the cost and financial accounting.
Internal check	Under it, the cross checking is not possible since they are independent to each other.	Under it, the cross checking is possible since they are dependent to each other.

2.7 PRACTICAL PROBLEMS

Illustration 1:

Journalise the following transactions assuming that cost and financial accounts are integrated:

Particulars	**Rs.**
Raw materials purchased	1,50,000
Direct material issued to production	1,12,500
Wages paid (30% indirect)	90,000
Manufacturing expenses incurred	63,000
Manufacturing overheads charged to production	69,000
Selling and distribution cost	15,000
Finished product at cost	1,50,000
Sales	2,25,000
Receipts form customer	52,500
Paid to creditors	82,500
Closing stock	Nil

Adapted

Solution:

Journal

	Particulars	**Debit Amount (Rs.)**	**Credit Amount (Rs.)**
1	Stores ledger control a/c Dr. To bought ledger control a/c (being raw material bought)	1,50,000	1,50,000
2	Work-in-progress ledger control a/c Dr. To Stores ledger control a/c (being materials issued for production)	1,12,500	1,12,500
3	Wages control a/c Dr. Factory overhead control a/c Dr. To Bank a/c (being wages paid)	63,000 27,000	90,000
4	Work-in-progress ledger control a/c Dr. To Wages control a/c (Being the allocation of wages to production)	63,000	63,000
5	Factory overhead control a/c Dr. To Bank a/c (Being the manufacturing expenses incurred)	63,000	63,000
6	Work-in-progress ledger control a/c Dr. To Factory overhead control a/c (Being overhead charged to production)	69,000	69,000

	Particulars	Debit Amount (Rs.)	Credit Amount (Rs.)
7	Selling & distribution overhead control a/c Dr. To Bank a/c (Being selling and distribution cost incurred)	15,000	 15,000
8	Finished stores ledger control a/c Dr. To Work in progress ledger control a/c (Being cost of production of completed jobs)	1,50,000	 1,50,000
9	Cost of sales a/c Dr. To Finished stock ledger control a/c To Selling & distribution overhead control a/c (Being the cost of products sold)	1,65,000	 1,50,000 15,000
10	Sales ledger control a/c Dr. To Sales a/c (being the amount of sales)	2,25,000	 2,25,000
11	Bank a/c Dr. To Sales ledger control a/c (being amount received from customers)	52,500	 52,500
12	Bought ledger control a/c Dr. To Bank a/c (being amount paid to credirors)	82,500	 82,500

Illustration 2:

From the following information you are requested to pass journal entries and prepare necessary accounts under the system of integrated accounts

Material purchased on credit	1,48,000
Wages paid	1,68,000
Wages productive	148,000
Wages unproductive	20,000
Material issued to production	128,000
Works expenses incurred	65,000
Works expenses charged to production	86,000
Office and administration expenses paid	44,000
Office and administration expenses charged to production	43,500
Cost of Goods sold	300,000
Selling overheads expenses paid	45,000
Selling overheads charged to sales	45,000
Sales credit	390,000

Solution:

Journal

	Particulars	Debit Amount (Rs.)	Credit Amount (Rs.)
1	Stores ledger control a/c Dr. To Creditors a/c (being the stores purchased on credit)	148,000	148,000
2	Wages control a/c Dr. To Cash a/c (being wages paid)	168,000	168,000
3	Work-in-Progress control a/c Dr. To Wages Control a/c (being the wages charged to production)	148,000	148,000
4	Work Expenses Control A/c Dr. To Wages Control A/c (Being the wages charged to work expenses since these are indirect payments)	20,000	20,000
5	Work-in-Progress Control a/c Dr. To Stores Ledger Control A/c (Being materials issued to Production)	128,000	128,000
6	Work Expenses Control a/c Dr. To Cash (being the works expenses paid during the year)	65,000	65,000
7	Work-in-Progress Control a/c Dr. To Work Expenses Control A/c (being the works expenses charged to production)	86,000	86,000
8	Office and Administration Expenses Control A/c Dr. To Cash (Being amount paid to office expenses)	44,000	44,000
9	Work-in-Progress Control A/c Dr. To Office and Administration Expenses Control A/c (Being office and administration expenses charged to production)	43,500	43,500
10	Cost of Sales A/c Dr. To Work-in-Progress Control A/c (Being the finished product transferred)	300,000	300,000
11	Selling Expenses Control A/c Dr. To Cash (Being the selling expenses incurred)	45,000	45,000
12	Cost of Sales A/c Dr. To Selling Expenses Control A/c (Being selling expenses charged to sales)	45,000	45,000
13	Debtors A/c Dr. To Sales A/c (Being sales made on credit)	390,000	390,000

Stores ledger control account

Particulars	Rs.	Particulars	Rs.
To creditors	**148,000**	**By** Work-in-process control A/c	**128,000**
		By balance c/d	**20,000**
	148,000		**148,000**

Wages ledger control account

Particulars	Rs.	Particulars	Rs.
To cash	**168,000**	**By** Work-in-process control A/c	**148,000**
		By works expenses control a/c	**20,000**
	168,000		**168,000**

Works expenses control account

Particulars	Rs.	Particulars	Rs.
To wages control a/c	**20,000**	**By** Work-in-process control A/c	**86,000**
To cash	**65,000**		
To balance c/d	**1,000**		
	86,000		**86,000**
		By balance b/d	**1,000**

Office and administrative expenses control account

Particulars	Rs.	Particulars	Rs.
To cash	**44,000**	**By** Work-in-process control A/c	**43,500**
		By balance c/d	**500**
	44,000		**44,000**

Selling expenses control account

Particulars	Rs.	Particulars	Rs.
To cash	**45,000**	**By Cost of sales** A/c	**45,000**
	45,000		**45,000**

Work-in-progress control account

Particulars	Rs.	Particulars	Rs.
To wages control a/c	**148,000**	**By cost of sales**	**300,000**
To stores ledger	**128,000**	**By balance c/d**	**105,500**
To works expenses	**86,000**		
To office and administration exp.	**43,500**		
	405,500		**405,500**

Illustration 3:

Journalise the following transactions under integral accounting system

Direct wages paid in cash	60,000
Indirect wages paid in cash	30,000
Purchases made in cash	15,000
Purchases (credit)	290,000
Stores issued against production order	275,000
Works expenses incurred and paid in cash	55,000
Works expenses allocated to jobs	80,000
Administration expenses paid in cash	40,000
Administration expenses allocated to jobs	48,000
Finished goods transferred to warehouse	450,000

I.C.W.A Inter adapted

Solution:

Journal entries under integrated accounting system

	Particulars	**Debit Amount (Rs.)**	**Credit Amount (Rs.)**
1	Wages control a/c Dr. To Cash a/c (being direct and indirect wages paid in cash)	90,000	 90,000
	Work-in-progress control a/c Dr. Production overhead control a/c Dr. To wages control a/c (being direct wages transferred to WIP control a/c and indirect wages to production overhead control a/c)	60,000 30,000	 90,000
	Stores ledger control a/c Dr. To Cash a/c To sundry creditors a/c (being purchases made in cash and on credit)	305,000	 15,000 290,000
	Work in progress ledger control a/c Dr. To stores ledger control a/c	275,000	 275,000
	Production overhead control a/c Dr. To Cash a/c (works expenses paid in cash)	55,000	 55,000
	Work in progress ledger control a/c Dr. To Production overhead control a/c (works expenses charged to production)	80,000	 80,000
	Administration overhead control a/c Dr. To Cash a/c (Administration expenses paid in cash)	40,000	 40,000
	Finished goods control a/c Dr. To Administration overhead control a/c (Administration overhead charged to finished goods)	48,000	 48,000
	Finished goods control a/c Dr. To work in progress ledger control a/c (Transfer to finished goods to warehouse)	450,000	 450,000

Illustration 4:

Journalise the following transactions in the integrated books of accounts

1	Credit purchased	1200,000
2	Production wages paid	700,000
3	Stock issued to production orders	800,000
4	Works expenses charged to production	450,000
5	Finished goods transferred from production orders	1800,000
6	Administration expenses charged to production	150,000
7	Works expenses outstanding	120,000
8	Works expenses paid	460,000

I.C.W.A INTER ADAPTED

Solution:

Journal entries under integrated accounting system

	Particulars	**Debit Amount (Rs.)**	**Credit Amount (Rs.)**
1	Stores ledger control a/c Dr. To sundry creditors a/c (being purchase of material on credit)	1200,000	1200,000
2	Wages control a/c Dr. To cash or bank a/c (wages paid to workers in cash/cheque)	700,000	700,000
3	Work in progress ledger control a/c Dr. To stores ledger control a/c (stores issued against production orders)	800,000	800,000
4	Work in progress ledger control a/c Dr. To production overhead control a/c (works expenses charged to production)	450,000	450,000
5	Finished goods ledger control a/c Dr. To Work in progress ledger control a/c (Goods finished during the year transferred)	1800,000	1800,000
6	Work in progress ledger control a/c Dr. To Administration overhead control a/c (Admin overhead charged to production)	150,000	150,000
7	Production overhead control a/c Dr. To outstanding works overhead a/c (works overhead incurred during the period but still unpaid)	120,000	120,000
8	Production overhead control a/c Dr. To cash /bank a/c (works expenses paid in cash /cheque during the period)	120,000	120,000

2.8 SUMMARY

In this chapter we will able to understand the concept of integrated system of accounting and we will understand how to journalise the entries for the integrated accounting system

2.9 QUESTIONS

1. An integrated system of accounts are maintained

   a) in separate books of accounts for costing and financial accounting purposes

   b) In the same books of accounts

   c) both (a)&(b)

   d) None of the above

Answer: b

2. What will be the accounting entry in integrated accounts for absorption of works overhead?

   a) Factory overhead A/c Dr.

      To Work-in-Progress A/c

   b) Factory overhead A/c Dr.

      To Factory overhead control A/c

   c) Work-in-Progress control A/c Dr.

      To Factory overhead control A/c

   d) no entry required

Answer: c

3. _____ Accounts is the name given to a system whereby cost and financial accounts are kept in the same set of books.

   a) Non-integrated

   b) Finalize

   c) Cost

   d) Integrated

Answer: d

4. In entry under the integrated system for credit purchases of material for stock, stores ledger control is_____

   a) Non impacted

b) increased

c) debited

d) credited

Answer: c

5. In entry under the integrated system for cash purchases of special materials for direct use in a job _____ account is debited.

a) general ledger adjustment

b) stores ledger control

c) cost ledger control account

d) work-in-progress

answer: D

SHORT NOTES

1) Explain the Features of an integrated system of accounts

2) Explain the difference between an integrated system and non integrated system

3) Explain the advantages and disadvantages of an integrated system of accounts

4) Explain the important journal entries in this system

5) What are the impact of this system in accounting?

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3

NON-INTEGRATED SYSTEM OF ACCOUNTS

Unit Structure

3.0 OBJECTIVES

After studying this unit, the learner will be able to –

- Understand the concept of Non-Integrated system of accounts, its features, Advantages & Disadvantages.
- Able to solve the practical problems.
- Identify ledgers maintained under non-integrated accounts
- Able to understand the journal entries for accounting purposes.

3.1 INTRODUCTION

Non integrated system of accounting is a system under which two separate sets of accounts are maintained in which one is for cost accounting and another is for finance accounting, in other words cost accounts are maintained separately from financial accounts.

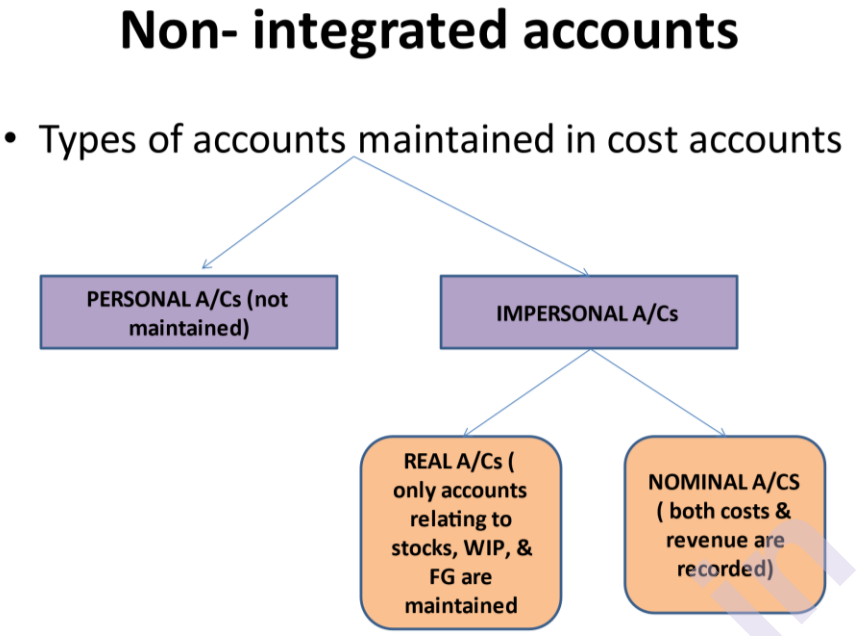
Since both the books prepared by separately hence, the cost accountant is responsible for cost records and financial accountant is responsible for financial transactions.

Non- -integrated system of accounting is also known as a non-integrated system or inter-locking system or cost ledger accounting system

3.2 MEANING

It is a system where separate ledgers are maintained for cost and financial accounting by the accountant. Under such a system of accounting the cost

accounts restricts itself to recording only those transactions which relates to the product or services being provided.



3.3 FEATURES

1. Separate account books are maintained to record financial and cost transactions.
2. Financial and cost accountant both are responsible to record transactions in the book separately.
3. The double entry system is adapted for recording the transactions in both accounts books. Personal and real accounts are not opened in cost account books.
4. General and cost ledger adjustment account is opened in cost books to complete the double entry system
5. Reconciliation statement is prepared to reconcile profits as revealed by cost account books and financial account books

3.4 ADVANTAGES AND DISADVANTAGES

Advantages

1. This system tends to coordinate the functions of different selection of the accounts department since all efforts are integrated and directed towards achievement of one aim that is providing a high level of efficiency,

2. The accounting procedures can be simplified and the system can be centralized with the object of achieving a greater control over the organization.

3. The system creates conditions which are eminently suitable for the introduction of mechanized accounting

4. There is no possibility of overlooking any expense under the system.

5. As cost accounts are posted straight from the books of original entry, there is no delay in obtaining the data

6. Integrated accounting widens the outlook if the accountant.

7. It can be maintained according to convenience as it need not be statutorily maintained

Disadvantages

1. The Financial transactions other than cost incurred are not recorded in the system.

2. Transactions involving payment other than that of cost are not included in the system e.g. loss on fixed assets

3. There is always a difference between the profits reported as per the cost accounting system and the financial accounting system.

3.5 NECESSERY ACCOUNTS REQUIRED TO BE PREPARE

1. General Ledger Adjustment A/c or Cost Ledger Control A/c:

This is practically a dummy account and is to be used where one of the two parts of the journal is recorded. One is a cost sheet item and the other is a Balance Sheet item. Since Balance Sheet items have no place in our system, the Balance Sheet part of the Journal, whether debit or credit, is to be replaced by this account. If both the parts of the journal are balance sheet items or both the parts are cost sheet items, then naturally this account has no use.

Dr. General ledger adjustment account Cr.

Date	Particulars	Rs	Date	Particular	Rs
	To cost ledger control a/c.....	Xxx		By balance sheet b/d.....	Xxx
	To profit and loss a/c (sales).....	Xxx		By stores ledger.....	Xxx
	To balance c/d.....	xxx		Control a/c (purchase).....	Xxx
				By W-I-P control a/c.....	Xxx
				(special purchase)	Xxx
				By wages control a/c.....	Xxx
				By production overhead a/c.....	Xxx
				By adm. Overhead a/c.....	Xxx
				By selling overhead a/c.....	Xxx
				By costing P/L a/c.....	
		XXX			XXX

2. Stores Ledger Control A/C.

This is in respect of raw material when raw material is purchased, this account is debited and when raw material is issued to the production department, it is credited to this a/c and debited to Work in-progress a/c. The material issued for repairs and maintenance is also credited to this account and debited to factory overheads account. Likewise, abnormal loss of material is credited to this account and debited to costing profit and loss A/c.

Dr. Stores ledger control account Cr.

Date	particulars	Rs	Date	Particulars	Rs.
	To balance b/d.....	Xxx		By W-I-P control a/c.....	Xxx
	To general ledger adj. a/c.....	xxx		By production overhead a/c.....	Xxx
				By general ledger adjustment a/c	xxx
				By balance c/d.....	Xxx
		XXX			XXX

3. Work -In -progress ledger control a/c :

On the debit side of this A/c, we write opening balance and factory cost incurred. On the credit side, factory cost of production completed is transferred to finished goods ledger control a/c and balance is closing stock. Also, if there is some abnormal loss, the factory cost of abnormal loss (Prime Cost and Factory Overheads) is credited to this A/c and debited to abnormal loss A/c and similarly, abnormal gain is debited to this a/c and credited to abnormal gain a/c.

Dr. Work-in-progress ledger control account Cr.

Date	Particulars	Rs	Date	Particulars	Rs
	To balance b/d.....	Xxx		By finished goods ledger a/c....	Xxx
	To general ledger adj. a/c.....	Xxx		By balance c/d.....	xxx
	To stores ledger control a/c.....	Xxx			
	To wages control a/c.....	Xxx			
	To production overhead a/c....	xxx			
		XXX			XXX

4. Finished Goods Ledger Control A/C :

On the debit side of this A/c, we write opening stock of finished goods, factory cost of production completed and transferred to warehouse and administration overheads. On the credit side, the production cost of goods sold is transferred to cost of sales a/c and the balance is closing stock of finished goods.

Cr. Finished goods ledger control account Cr.

Date	Particulars	Rs	Date	Particulars	Rs
	To S & D overhead a/c.....	Xxx		By profit and loss a/c.....	xxx
	To finished goods ledger control a/c	Xxx			
		XXX			XXX

5. Wage Control A/C :

On the debit side of this a/c, we write the wages incurred, whether direct or indirect. On the credit side, the indirect wages could be factory, administration or Selling & Distribution overheads and depending on that, we transfer them to Factory overheads Control A/c, administration Overheads Control A/c or S & D overheads Control A/c. direct wages are transferred to Work-in-progress account. It is also possible (in fact, better) to transfer to this account, only direct wages and to transfer indirect wages directly from GLA A/c to respective overheads accounts.

Dr. Wages control account Cr.

Date	Particulars	Rs	Date	Particulars	Rs
	To general ledger adj. a/c.....	Xxx		By W-I-P control a/c.....	Xxx
				By production overhead a/c....	Xxx
				By adm. Overhead a/c.....	Xxx
				By s & o overhead a/c.....	Xxx
		XXX			XXX

6. Factory overheads Control A/c, Administrative Overheads Control A/c, Selling and Distribution overheads control a/c:

On the Debit side of each of these accounts, we write the amount actually spent. The factory overheads, to the extent recovered, are transferred to Work-in-progress Ledger Control A/c. The administrative overheads are similarly transferred to Finished Goods Ledger Control A/c and Selling & Distribution Overheads are transferred to Cost of Sales a/c.

As regards the difference between the amount spent and recovered, if there is some instruction, direct or indirect, it should be followed. In the absence thereof, there are two alternatives. One is to transfer the difference to Costing Profit & Loss A/c and the other is to carry it forward by showing the difference as closing balance. It is also possible to follow supplementary rate system.

If opening trail balance is given and such items do appear in it then that means the company follows the policy of carrying forward the difference to the next period. If they do not appear in the opening trial balance then, in the absence of information to the contrary, these A/c's should be closed by transferring the difference to Costing Profit & Loss A/c. If the supplementary system is to be followed, then, the difference should be transferred to the same account to which absorption is transferred.

Dr. General ledger adjustment account Cr.

Date	Particulars	Rs	Date	Particulars	Rs
	To general ledger a/c.....	Xxx		By W-I-P control a/c.....	Xxx
	To stores ledger control a/c.....	Xxx			
	To wages control a/c.....	Xxx			
	To costing P/L a/c.....	Xxx			
		XXX			XXX

7. Cost of Sales A/C :

On the debit side of this A/c we write production cost of goods sold (which is transferred from finished goods ledger control a/c) and Selling and Distribution Overheads. The total being cost of sales, we transfer it to Costing Profit and Loss A/c.

Dr.	Cost of sales account				Cr.
Date	Particulars	Rs	Date	Particulars	Rs
	To S & D overhead a/c..... To Fixed goods ledger control a/c	Xxx xxx		By profit and loss a/c.....	Xxx
		XXX			XXX

8. Sales A/C :

On the credit side of this a/c, we write the amount of sales by debiting General ledger Adjustment A/c and we close this A/c by transferring sales to costing Profit and Loss A/c.

9. Abnormal Loss / Gain A/C:

These are the a/c's for recording the transactions of abnormal nature and we close these a/c's by transferring the balance to profit and Loss A/c.

10. Costing Profit and Loss A/C :

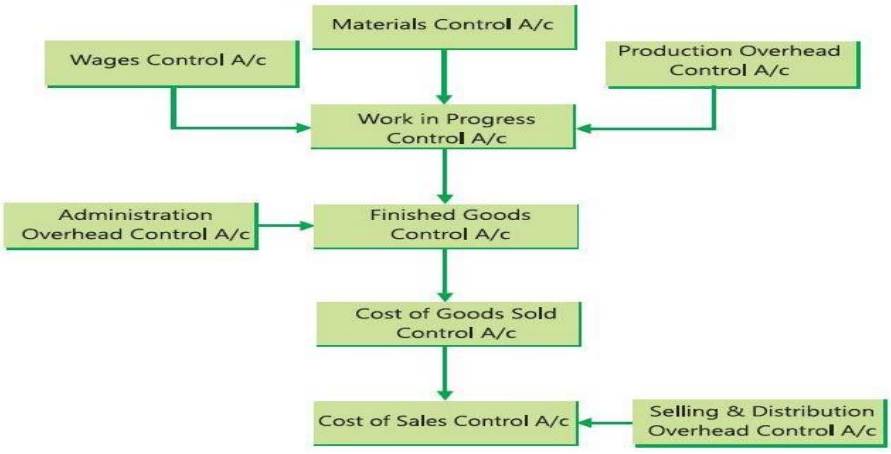
On the debit side of this A/c, we write the cost of sales and abnormal losses and on the credit side sales and abnormal gain. Based on the policy as regards overheads, the under / over absorption may also be written on the debit side or as the case may be on credit side. We close this a/c by transferring the profit (loss) to General Ledger adjustment A/c.

Dr.	Costing profit and loss account				Cr.
Date	particulars	Rs	Date	Particulars	Rs
	To cost of sales a/c..... To adm. Overhead a/c..... To S & D overhead a/c..... To general ledger adjust. a/c..... To net profit.....	Xxx Xxx Xxx Xxx Xxx		By sales..... By production overhead a/c.....	Xxx Xxx
		XXX			XXX

11. Trial Balance :

Whether asked for or not, it is always advisable to prepare the trial balance. Obviously, the closing balances would be inventory accounts, General Ledger Adjustment accounts and Overhead A/c's (If the policy is to carry forwards the difference).

Non integrated accounting system flow chart



3.5 JOURNAL ENTRIES AND PREPARING COST CONROL ACCOUNTS

Journal entries

transactions	Entry
1. Materials purchased: (a) For stock	Stores ledger contract a/c .....dr To general ledger adjustment a/c
(b) For special jobs	Work-in-progress control a/c.....dr To general ledger adjustment a/c.
2. Materials issued (a) Direct materials	W-I-p control a/c.....dr To stores ledger control a/c
(b) Indirect materials	Work-in-progress control a/c.....dr To stores ledger control a/c
(c) Return to suppliers	General ledger adjustment a/c.....dr To stores ledgers control a/c
3. Materials returned from shop floor:	Stores ledger control a/c.....Dr To work-in-progress control a/c
4. Materials transferred from job to job (no entry in control a/c)	Transferee job.....Dr To transferor job a/c
5. Labour (a) Total wages paid:	Wages control a/c.....Dr To general ledger adjustment a/c
(b) Allocation: For direct labour For indirect labour	W-I-P a/c.....Dr To wages control a/c To respective overhead control a/c
6. Direct expenses	W-I-P control a/c.....Dr To general ledger adjustment a/c
7. (a) overhead incurred and accrued	Respective overhead overhead a/c.....Dr To general ledger adjustment a/c
(c) Overhead incurred and accrued:	W-I-P a/c(for works overhead).....Dr Finished goods ledger control a/c.....Dr (for administration overheads) To respective overhead control a/c
(d) Work-in progress:	W-I-P a/c .....Dr To respective overhead control a/c.
8. Finished stock (a) produced:	Finished goods ledger control a/c.....Dr To W-I-P a/c
8. Finished stock (a) produced:	Finished goods ledger control a/c.....Dr To W-I-P a/c
(c) Sold (at cost)	Cost of sales a/c .....Dr To finished goods ledger control a/c.....Dr To respective overhead control a/c
(d) Sales return	General ledger adjustment a/c.....Dr Cost of sales a/c credit.....Dr To general ledger adjustment a/c
9. Capital work (on completion)	General ledger adjustment a/c.....Dr To capital order a/c
10. Repairs work (on completion)	Respective overhead control a/c.....Dr To repair order a/c
11. Special order completion and sold immediately at factor cost	Cost of sales a/c.....Dr To W-I-P control a/c
Special order completion and sold immediately at total cost	General ledger adjustment a/c.....Dr To cost of sales a/c.

COST CONTROL ACCOUNTS

Meaning :-

Cost Accounting means the process of accounting for cost from the point at which the expenditure is incurred to the establishment of its ultimate relationship with cost center and cost units.

Control and Profitability :-

The scope of cost accounting extends to preparation of statistical data or cost control accounts. There are two types of cost accounting integrated and Non-integrated.

Integrated System :-

It is a system in which the Financial and Cost Account are integrated to insure that all relevant expenditure is absorb into the cost account.

Non - Integrated System :-

It is a system in which the cost account are different from the Financial account, the two sets of accounts being kept continuously in agreement by the use of cost control. Under this system the separate account are prepared called as Cost Journal and Cost Ledger.

Journal Entries

	Financial Account	**Cost Account**
1)	Credit Purchase of Material for Stock	
	Purchases A/c - Dr	Store ledger control A/c - Dr
	To Sundry Creditors	To Cost ledger control A/c
2)	Cash Purchase of Material for Stock	
	Purchase A/c - Dr	Stock ledger control A/c - Dr
	To cash A/c	To Cost ledger Control A/c
3)	Purchase of Special Material for Direct Use in a Process or Job	
	Purchase A/c - Dr	WIP Control A/c - Dr
	To Sundry Creditors / Cash A/c	To Cost Ledger Control A/c
4)	Purchase of Material for Immediate Repair Work	
		Factory O.H. Control A/c - Dr
		To Cost Ledger Control A/c
5)	Material Return of Supplier From Stock	
	Sundry Creditors A/c - Dr	Cost Ledger Control A/c - Dr
	To Purchase Return A/c	To Store Ledger Control A/c
6)	Payment to Creditors or Supplier	
	Sundry Creditors A/c - Dr	No Entry
	To Cash / Bank A/c	
7)	Issue of Direct Material for Production to Factory Job	
		WIP Control A/c - Dr
		To Store Ledger Control A/c
8)	Issue of Indirect Material	
		Factory O.H. Control A/c - Dr
		To Store ledger Control A/c

9) Return of Direct Material to Store

Store Ledger Control A/c - Dr
To WIP Control A/c

10) Return of Indirect Material

Store Ledger Control A/c - Dr
To factory O.H. Control A/c

11) Adjustment of normal loss in Material Stock

Factory O.H. Control A/c - Dr
To Store Ledger Control A/c

12) Adjustment of Normal Surplus in material stock

Store Ledger Control A/c - Dr
To Factory O.H. Control

13) Payment of Wages

Wages A/c - Dr	Wages Control A/c - Dr
To Insurance A/c	To Cost Ledger Control A/c
To Tax A/c	
To PF A/c	
To Cash A/c	

14 Analysis and Distribution of Wages

WIP Control A/c (Direct Wage) - Dr

Factory O.H. Control (Indirect Wages) – Dr

Admin O.H. Control (Office Salary) – Dr

Selling & Dis O.H. Control (Sale Staff Salary) – Dr

To Wages Control A/c

15) Payment for Expenses

Expenses A/c – Dr	Factory O.H. Control A/c – Dr
To Cash/Bank A/c	Admin O. H. Control A/c – Dr
	Selling & Distribution O. H. Control A/c
	To Cost Ledger Control

16) Recording Depreciation on Fixed Asst

Depreciation A/c - Dr	Factory / Admin / Selling Control A/c
To Fixed Asset A/c	To Cost Ledger Control A/c

17) Recording of Manufacturing O.H. applying at departmental Rate

WIP Control A/c - Dr
To Factory O.H. Control A/c

18 Abnormal Loss Due to Wastage

Costing P & L A/c - Dr
To WIP Control A/c

19) Scrap Taken on Stock Charge

Store Control A/c - Dr
To WIP Control A/c

20) Recording Cost of Goods Transfer to Finished Goods

Finished Goods Control A/c -Dr
To WIP Control A/c

21) Recording Sales

Debtors / Cash A/c - Dr
To Sales A/c

Cost Ledger Control A/c - Dr
To Sales (S. P.) A/c
To Casting P & L A/c (Profit)

22) Absorption of Admin O.H.

Finished Goods Control A/c - Dr
To Admin O.H. Control A/c

23) Absorption of Selling & Distribution O.H.

Cost of Sales A/c - Dr
To Sell & Dist O.H. Control A/c

24) Under absorb Factory, Admin & Selling O.H.

Costing P & L A/c - Dr

Finished Goods / WIP / Cost of Sales - Dr

OR

Overheads Suspense A/c - Dr

To Factory / Admin / Sell & Dis Control A/c

25) Over absorb Factory, Admin & Selling O.H.

Factory / Admin / Sell & dis. O.H. Control - Dr

To Costing P & L A/c

OR

To WIP / Finished Goods /Cost of Sales

OR

Overhead Suspense A/c

26) Recording Cost of Goods Gold

1) Cost of Sales A/c - Dr
To Finished goods A/c

2) Costing P & L A/c - Dr
To Cost of Sale Cost

Closing of the Ledger accounts:

After Completing the Journal Entries then Ledger A/c areclosed in the following manner.

1) Factory O.H. Controls A/c:

Difference in A/c Transfer to WIP or If the problem said transfer to next month (Closing Bal) by bal. c/d.

2) Admin O.H. Control A/c:

Difference in A/c Transfer to Costing P & L or O.H. Adjustment A/c.

3) Selling & Distribution O.H. :

Difference in A/c Transfer to Costing P & L A/c or O.H. Adjustment A/c.

4) O.H. Adjustment A/c:

Difference in O.H. Adjustment A/c either transfer to costing P&L A/c or if the problem said transfer in trial balance.

5) Cost of Sales:

Transfer the difference in this A/c to Costing P & L A/c.

6) Costing P & L A/c:

Difference in this A/c Transfer to Cost Ledger Control A/c.

7) Cost Ledger Control A/c / WIP Control A/c / Store Ledger Control A/c / FCI Control A/c:

Difference in resection Account Transfer to The Trial Balance (Closing Balance)

3.6 PRACTICAL PROBLEMS

Illustration 1:

From the following details prepare the necessary accounts in the cost ledger.

	Materials (Rs)	Work-in-process (Rs)	Finished stock (Rs)
Op Balance	8,000	5,000	10,000
Cl balance	11,000	9,000	12,000

Transactions during the period:	Rs.
Materials purchased	25,000
Wages paid (including Rs. 2,000 indirect)	10,000
Overheads incurred	8,000
Overheads absorbed	9,000
Sales	50,000

Adapted from CA Inter

Solution:

Cost ledgers

Cost ledger control accounts

Particulars	Rs.	Particulars	Rs.
To Cost of Sales A/c	50,000	By Balance b/d (8000+5000+10000)	23,000
		By stores ledger control a/c	25,000
		By wages control a/c	10,000
		By overheads control a/c	8000
To balance c/d (11000+9000+12000)	32,000	To costing profit and loss a/c (profit)	16,000
	82000		82000

Stores ledger control account

Particulars	Rs.	Particulars	Rs.
To Balance b/d	8,000	**By** Work-in-process A/c (balancing figure	22,000
To cost ledger control a/c	25,000	**By balance c/d**	11,000
	33,000		33,000

Work-in-process control A/c

Particulars	Rs.	Particulars	Rs.
To Balance b/d	5,000	**By** Finished stock (balancing figure)	35,000
To stores ledger control a/c	22,000	**By balance c/d**	9,000
To wages control a/c	8,000		
To overhead control a/c	9,000		
	44,000		44,000

Finished stock account

Particulars	Rs.	Particulars	Rs.
To Balance b/d	10,000	**By** Cost of Sales A/c (balancing figure)	33,000
To work-in-process control a/c	35,000	**By balance c/d**	12,000
	45,000		45,000

Wages control a/c

Particulars	Rs.	Particulars	Rs.
To Cost Ledger Control A/c	10,000	By Work-in-process Control A/c	8,000
		By overheads a/c	2,000
	10,000		10,000

Overheads control account

Particulars	Rs.	Particulars	Rs.
To Cost Ledger Control A/c	8,000	**By Work-in-process control a/c**	9,000
To wages control a/c	2,000	**By costing P& L A/c ***	1,000
	10,000		10,000

*[(overhead incurred + indirect wages)-overhead absorbed]
[(8000+2000)-9000]=1000 (under absorption)

Cost of Sales Account

Particulars	Rs.	Particulars	Rs.
To Finished stock A/c	33,000	**By costing p& l a/c**	33,000
	33,000		33,000

Costing P&L Account

Particulars	Rs.	Particulars	Rs.
To Cost of sales A/c	33,000	**By cost ledger control a/c(sales)**	50,000
To overheads control (under absorption)	1,000		
To cost control ledger a/c (profit) (bal fig)	16,000		
	50,000		50,000

Illustration 2:

From the following figures ascertained from costing records and financial books of a factory, you are required to pass necessary entries in the cost journal (assume that a system of maintaining control accounts prevails in the organization.)

Particulars	Rs.
Purchases	3,90,000
Carriage inward	5,850
Stores issued	3,58,800
Productive wages	3,46,320
Unproductive labour	1,21,680
Works on cost	3,48,400
Material used in repairs	3,120
Cost of completed jobs	12,80,630

CA Final

Solution:

Cost Journal

	Particulars	Debit Amount (Rs.)	Credit Amount (Rs.)
1	Stores ledger control a/c Dr. To Financial ledger control a/c (being the total amount of purchases as appeared in financial books)	3,90,000	3,90,000
2	Stores ledger control a/c Dr. To Financial ledger control a/c (being the total amount of carriage inwards as per financial books)	5,850	5,850
3	Work-in-progress ledger a/c Dr. To Stores ledger control a/c (being the amount of stores issued as per material abstract)	3,58,800	3,58,800

	Particulars	Debit Amount (Rs.)	Credit Amount (Rs.)
4	Wages control a/c Dr. To Financial ledger control a/c (being the amount of direct wages expended)	3,46,320	3,46,320
5	Work-in-progress ledger a/c Dr. To Wages control a/c (Being the amount of direct wages allocated to jobs)	3,46,320	3,46,320
6	Works overheads a/c Dr. To Financial ledger control a/c (Being the amount of indirect labour allocated to works overhead)	1,21,680	1,21,680
7	Works overheads a/c Dr. To Financial ledger control a/c (Being the amount of works expenses other than indirect wages as per financial books)	3,48,400	3,48,400
8	Works overheads a/c Dr. To stores ledger control a/c (Being the cost of materials used in repairs)	3,120	3,120
9	Finished Goods Ledger control a/c Dr. To Worl-in-progress ledger a/c (Being the cost of completed jobs transferred from work-in progress a/c)	12,80,630	12,80,630

Illustration 3:

C Ltd. Maintain a Separate Set of books for financial accounts andcost accounts. The following information is provided for the year 2014.

Particulars	Amount
Material Control A/c	60,000
WIP Control A/c	90,000
Finished Goods Control A/c	1,40,000
Cost Ledger Control A/c	2,90,000
Transaction for the year	
Material Purchase	6,60,000
Material Issue as Direct Material	4,50,000
Indirect Material	1,20,000
Wages Paid Allocated as	
Direct Cost	2,70,000
Indirect Cost	90,000
Production Expenses	2,40,000
Value of Finished Goods Produce	10,80,000

Closing Stock of F.G.	1,20,000
Administration expenses	2,40,000
Selling expenses	1,80,000
Sales	18,00,000

Prepare the Necessary Control A/c in the books of CostingRecords.

Journal Entries

Date	Particulars	L/F	Debit ₹	Credit ₹
1.	Material Control A/c - Dr To Cost Ledger Control A/c		6,60,000	6,60,000
2.	WIP Control A/c - Dr To material Control A/c		4,50,000	4,50,000
3.	Factory O.H. Control A/c - Dr To Material Control A/c		1,20,000	1,20,000
4.	WIP Control A/c - Dr To Wages Control A/c		2,70,000	2,70,000
5.	Factory O.H. Control A/c – Dr To Wages Control A/c		90,000	90,000
6.	Factory O.H. Control A/c - Dr To Cost Ledger Control A/c		2,40,000	2,40,000
7.	Finished Goods Control A/c - Dr To WIP Control A/c		1,08,000	1,08,000
8.	Office & admin O.H. Control A/c -Dr To Cost Ledge Control A/c		2,40,000	2,40,000
9.	Selling distribution O.H. Control A/c - Dr		1,80,000	

	To Cost Ledger Control A/c			1,80,000
10.	Cost Ledger Control A/c - Dr To Costing P & L A/c (sales)		18,00,000	18,00,000

Cost Ledger Control A/c

Particulars	₹	Particulars	₹
To Costing P & L A/c	18,00,000	By Bal. b/d	2,90,000
		By Material Control A/c	6,60,000
		By Factory O.H. Control A/c	2,40,000
		By Office & Admin O.H. Control A/c	2,40,000
To Bal. C/d	4,50,000	By Selling & Distribution O.H. Control A/c	1,80,000
		By Salary Swages Control A/c	3,60,000
		By Costing P & L A/c	2,80,000
	22,50,000		22,50,000

Material Control A/c

Particulars	₹	Particulars	₹
To Bal. b/d	60,000	By WIP Control A/c	4,50,000
To Cost Ledger Control a/c	6,60,000	By Factory O.H. Control a/c	1,20,000
		By Bal. c/d	1,50,000
	7,20,000		7,20,000

WIP Control A/c

Particulars	₹	Particulars	₹
To Bal. b/d	90,000	By Finished Goods	10,80,000
To Wages Control A/c	2,70,000	By Bal c/d	1,80,000
To Material Control a/c	4,50,000		
To Factory O.H. Control A/c	4,50,000		
	12,60,000		12,60,000

Finished Goods Control A/c

Particulars	₹	Particulars	₹
To Bal. b/d	1,40,000	By Costing A/c (Cost of Sales)	11,00,000
To WIP Control A/c	10,80,000	By Bal c/d	1,20,000
	12,20,000		12,20,000

Factory O.H. Control A/c

Particulars	₹	Particulars	₹
To Material Control A/c	1,20,000	By WIP Control A/c	4,50,000
To Wages Control A/c	90,000		
To Cost ledger Control	2,40,000		
A/c			
	4,50,000		4,50,000

Office & Admin Control A/c

Particulars	₹	Particulars	₹
To Cost Ledger A/c	2,40,000	By Costing P & L A/c	2,40,000
	2,40,000		2,40,000

Selling & Distribution A/c

Particulars	₹	Particulars	₹
To Cost Ledger A/c	1,80,000	By Costing P & L A/c	1,80,000
	1,80,000		1,80,000

Salary & Wages A/c

Particulars	₹	Particulars	₹
To Cost Ledger A/c	3,60,000	By WIP Control A/c By Factory O.H.	2,70,000 90,000
	3,60,000		3,60,000

Costing P & L A/c

Particulars	₹	Particulars	₹
To Finished Goods	4,00,000	By Cost Ledger A/c	18,00,000
Control a/c			
To Admin O.H. Control A/c	2,40,000		
To Selling A/c	1,80,000		
To Cost Ledger	2,80,000		
Control a/c			
	18,00,000		18,00,000

Trial Balance

Particulars	Debit	Credit
Cost Ledger Control A/cMaterial Control A/c WIP Control A/c Finished Goods	1,50,000 1,80,000 1,20,000	4,50,000
	4,50,000	4,50,000

From 31st March 2013 the following balances extracted fromthe book of the co.

Trial Balance

Particulars	₹	₹
Store Ledger Control a/cWIP FCT Cost Ledger Control A/c	3,50,000 3,80,000 2,50,000	9,80,000
	9,80,000	9,80,000

Illustration 4:

Following Transaction took place in March 2013

Particulars	₹
Raw Material Purchases	9,50,000
Return to Supplier	30,000
Issue to Production	9,80,000
Return to Store	30,000
Production Wages	4,00,000
Indirect Labour	2,50,000
Factory O.H.	5,00,000
Selling Distribution O.H.	7,00,000
Cost of Finished Goods Transfer To Warehouse	21,30,000
Cost of Goods Sold	21,00,000
Sales	30,00,000

Factory O.H. are apply to production at 150% of on, any under or our absorbed overheads being carry forward for adjustments in the subsequent month. All selling & distribution O.H. are created as a period cost and charge to the Profit & Loan A/c of the month in which they are incurred.

Show the necessary control A/cs, Costing P & L A/c and trial balance.

Journal Entries

Date	Particulars	L/F	Debit Rs.	Credit Rs.
1.	Store Ledger Control A/c - Dr		9,50,000	
	To Cost Ledger Control A/c			9,50,000
2.	Cost Ledger Control A/c - Dr		30,000	
	To Store Ledger Control A/c			30,000
3.	WIP Control A/c - Dr		9,80,000	
	To Store Ledger Control A/c			9,80,000
4.	Store Ledger Control A/c - Dr		30,000	
	To WIP Control A/c			30,000
5.	WIP Control A/c - Dr		4,00,000	
	To Wages Control A/c			4,00,000
6.	Factory O.H. Control A/c - Dr		2,50,000	
	To Wages Control A/c			2,50,000
7.	Factory O.H. Control A/c - Dr		5,00,000	
	To Cost Ledger Control A/c			5,00,000
8.	Selling & Distribution O.H.Control A/c - Dr		4,00,000	
	To Cost Ledger Control A/c			4,00,000
9.	F. G. Control A/c - Dr		21,30,000	
	To WIP Control A/c			21,30,000
10.	Cost of Sales A/c - Dr		21,00,000	
	To Finished Goods Control A/c			21,00,000
11.	Cost Ledger Control A/c - Dr		30,00,000	
	To Costing P & L A/c			30,00,000
12.	WIP Control A/c - Dr (4,00,000 x150%)		6,00,000	
	To Factory O.H. Control A/c			6,00,000

Cost Ledger Control A/c

Particulars	₹	Particulars	₹
To Store Ledger Control A/c	30,000	By Bal. b/d	9,80,000
To Costing P & L A/c	30,00,000	By Store Ledger Control A/c	9,50,000
To Bal C/d	9,50,000		

		By Factory O.H. Control A/c	5,00,000
		By Selling Distribution A/c	4,00,000
		By Wages Control A/c	6,50,000
		By Costing P & L A/c	5,00,000
	39,80,000		39,80,000

Store Ledger Control A/c

Particulars		₹	Particulars		₹
To Bal. b/d		3,50,000	By Cost Control A/c	Ledger	30,000
To Cost Control A/c	Ledger	9,50,000	By WIP A/c		9,80,000
To WIP A/c		30,000	By Bal c/d		3,20,000
		13,30,000			13,30,000

WIP

Particulars	₹	Particulars	₹
To Bal. b/d	3,80,000	By Store Ledger Control A/c	30,000
To Store Ledger Control A/c	9,80,000	By Finished Goods Control a/c	21,30,000
To Wages Control A/c	4,00,000	By Bal. c/d	2,00,000
To Factory O.H. A/c	6,00,000		
	23,60,000		23,60,000

Finished Goods

Particulars	₹	Particulars	₹
To Bal. b/d	2,50,000	By Cost of SalesBy	21,00,000
To WIP Control A/c	21,30,000	Bal. c/d	2,80,000
	23,80,000		23,80,000

Wages Control A/c

Particulars	₹	Particulars	₹
Cost LedgerControl A/c	6,50,000	By WIP	4,00,000
		By Factory O.H.	2,50,000
	6,50,000	Control A/c	6,50,000

Factory O.H. Control A/c

Particulars	₹	Particulars	₹
To Wages Control A/c	2,50,000	By WIP	6,00,000
To Cost Ledger A/c	5,00,000	By Bal. c/d	
	7,50,000		7,50,000

Selling & Distribution Control A/c

Particulars	₹	Particulars	₹
To Cost Ledger A/c	4,00,000	By Costing (Bal) P & L A/c	4,00,000
	4,00,000		4,00,000

Costing P & L A/c

Particulars	₹	Particulars	₹
To Selling &	4,00,000	By Cost Ledger A/c	30,00,000
Distribution			
To Cost of sales	21,00,000		
To Cost Ledger A/c	5,00,000		
(Profit) (Bal.)			
	30,00,000		30,00,000

Cost of Sales A/c

Particulars	₹	Particulars	₹
To F. G. A/c	21,00,000	By Costing P & L (Bal.)	21,00,000
	21,00,000		21,00,000

Trial Balance

Particulars	Dr. ₹	Cr. ₹
Cost Ledger Control A/c		9,50,000
Store Ledger Control A/c	3,20,000	
WIP	2,00,000	
F. G	2,80,000	
Factory O.H. Control A/c	1,50,000	
	9,50,000	9,50,000

3.7 SUMMARY

With this we are ending up our discussion on non-integral system of cost accounting. Where we have learned in detail various journal entries to be

reflected into the books of accounts and we have also learned about the treatment of the production overheads, when they are being under recovered and over recovered. Both in the case of seasonal factory and non-seasonal factory.

3.8 QUESTIONS

A. Fill in the blanks:

1. Under accounting system, only one set of books of accounts is prepared (integral)
2. Under accounting system, two sets of books of accounts are prepared (non-integral)
3. In integral accounting system the transaction having both the parts of the journal are balance sheet items then this transactionis not recorded in----------adjustment a/c. (General ledger or Cost Ledger)
4. It both the parts of the journal entry are cost sheet items, then there is no entry in --.(General ledger or Cost Ledger)
5. Cost and financial accounts are required to be reconciled under- ----------accounting system (non-integral)

Short notes

1) Advantages and disadvantages of non integrated system of accounting
2) Features of Non-integrated system of accountings
3) Explain the ledger accounts to be maintained in cost control accounting

B. Practical problems

Q.1 The financial and cost accounts of XYZ ManufacturingCompany for the year ended 31 March, 2007 have been reconciled as below:

Particulars		₹	Particulars	₹
Raw Materials:				
Opening Stock	56,450		Cost of Goods Manufactured (Trf. To Trading A/c)	8,10,000
Purchase	3,24,560			
	3,81,010			
Less: Closing Stock	58,060	3,22,950		
Production Overheads		2,39,370		
Direct Wages		2,47,320		

Particulars		₹	Particulars	₹
Work in Progress:				
- Opening Stock	18,620			
- Closing Stock	18,260	360		
		8,10,000		8,10,000
Finished Goods:				
Opening Stock	1,42,350		Sales	11,03,500
Cost of Goods Manufactured	8,10,000			
	9,52,350			
Closing Stock	1,46,850	8,05,500		
Gross Profit		2,98,000		
		11,03,500		11,03,500
Administration Expenses		1,24,620	Gross Profit	2,98,000
Selling Expenses		87,380	Discount Received	1,600
Discount Allowed		1,240		
Debenture Interest		6,360		
Net Profit		80,000		
		2,99,600		2,99,600

Financial Profit and Loss A/c. for The Year Ended 31st March, 2007.

Reconciliation means they are foil non-interned A/c system of financial and cost accounts for the year ending on 31st March, 2007.

	₹		₹
Profit as per Financial A/c	80,000	Profit as per Cost A/c	84,550
Discount Allowed	1,240	Discount Received	1,600
Debenture Interest	6,360	Difference in Stock valuation:	
Difference in Stock Valuation:		Raw Material: Opening	700
Workin progress: Closing	480	Raw Materials : Closing	750
Finished Goods: Opening	720	Workin Progress: Opening	620
		Finished Goods: Closing	580
	88,800		88,800

Data in The Cost Accounts Include:	₹	
Direct Material Price Variance	3,120	Adverse
Direct Material Usage Variance	1,280	Adverse
Direct Labour Rate Variance	4,160	Favourable
Direct Labour Efficiency Variance	4,470	Favourable
Production Overhead Expenditure Variance	4,880	Favourable
Production Overhead Volume Variance	1,680	Adverse
Administration Overheads Cost Variance	620	Adverse
Selling and Distribution Cost Variance	620	Adverse
Selling Price Variance	5,000	Favourable
Sales Volume Variance	1,500	Adverse

You are required from the above data to show the necessary accounts as they should appear in the cost ledger under :

a) Partial Plan b) Single Plan

Q.2 Upto Date Ltd. which keeps cost control accounts in additionto the normal financial books of accounts is in the habit of preparing half - yearly accounts for ascertaining its performance.

From the information supplied hereunder, you are required to write up the cost ledger and prepare a costing profit and loss account showing the appropriate variances for the first half of the current year. Also ascertain the profit of the same periodas given by the financial accounts, reconciling this with the profit shown in the cost accounts. In the cost accounts, the balance at the end of the previous year were:

	At Standard Cost ₹ (000)	
General Ledger Control A/c.Raw Materials		3,450
Work in ProgressFinished Goods	1,025	
	1,840	
	585	
	3,450	**3,450**

The Summary of Transactions During the first half of the current year is :

	₹.(000)	
Purchase of raw material on credit	4,045	
Material Price Variance	95	Adverse
Material usage Variance	75	Adverse
Direct Wages Actual (6,50,000 hrs.)	3,390	
Standard Wages at ₹2.50 per hour	3,275	
Indirect Wages	1,155	
Indirect Materials and Expenses	965	
Depreciation	525	

	₹.(000)	
Administration, Selling and Distribution Expenses	2,925	
Material Issued to Production at Standard Price	4,000	
Factory Overheads absorbed to production at	2,620	
₹2.00 per standard direct labour hour		
Sales on Credit	15,735	
Items of Purely Financial Nature:		
Debenture Interest Paid	180	
Interest Received on Investments	35	
Donations and Charities	135	

	Costing Booksat Standard	Financial Books at Actual
	₹	₹
Opening Stock:		
Raw Materials	1,025	1,050
Work in Progress	1,840	1,825
Finished Goods	585	625
Closing Stock:		
Raw Materials	?	895
Work in Progress	1,725	1,755
Finished Goods	595	600

Please take not that the administration, selling and distribution expenses will be charged to Costing Profit and Loss Account.

Q.3 Chem-Tech is a firm belonging to chemical industry. It has a system of budgetary control and standard costing in operation. For accounting purposes, in follows integral system. As far as accounting for standard cost goes, it follows single plan.

The following trial balance was developed as on 30th April, 2007.

L. F. No.	Account Head	₹ (000)	
		Debit	Credit
101	Raw Material	12	
102	Fixed Assets	85	
103	Share Capital		200
104	Work in Progress	80	
105	Finished Goods	40	
106	Creditors Control		23
107	Debtors Control	59	

108	Cash and Bank	19	
109	Depreciation Provision		12
110	Reserves		40
111	Material Price Variance	4	
112	Labour Cost Variance	8	
113	Factory Overhead Variance		2
114	Sales		500
115	Standard Factory Cost of Sales	470	
		777	777

Following Transactions Took Place in May, 2007	**₹.(000)**
Purchases on Credit	50
Payment to Sundry Creditors	80
Labour Cost Incurred	22
Indirect factory Expenses	13
Standard Cost of Material Purchased	47
Collection from Customers	65
Stock of Raw Material as on 31-5-2007	14
Work in Progress as on 31-5-2007	
Direct Wages	13
Factory Overheads	8
Factory cost of Production:	
Material	60
Labour	22
Overheads	12

Sales in May ₹40,000. Opening Balance in WIP A/c. was developed with the help of a statement of equivalent production. This balance included labour cost of ₹15,000 and overheads cost of ₹10,000. Factory cost of sales 33,000. You are required to give effect to the above transactions and prepare the resultant trial balance as on 31st May, 2007.

Ignore Taxation.

❄❄❄❄❄❄❄

4

OPERATING COSTING - I

Unit Structure

4.0 LEARNING OBJECTIVES

After studying this chapter one should able to understand:

- The meaning of operating costing.
- Process to select cost limit in operating costing.
- Procedure in operating costing according to the procedure of a transporter
- Accounting procedure of a Hotel
- Accounting procedure of a Hospital

4.1 INTRODUCTION

Operating Costing method is normally used in service sector. When the service is not completely standardized, it is the cost of producing and monitoring a service. It is a method of costing applied to undertakings which provide service rather than production of commodities. Service may be performed internally and externally. Services are termed as internal when they have to be performed on inter-departmental basis in factory itself e.g. Power house services, canteen service etc.

Services are termed as external when they are to be rendered to outside parties. Public utility services like transport, water supply, electricity supply, hospitals are the best example for the service costing. Thus operating costing is a method of cost accumulation which is designed to determine the cost of services.

Operating costing is just a variant of unit or output costing. Operating costs are collected periodically like process cost. The cost of rendering the service for particular period is related to quantum of services rendered during the particular period to arrive at cost per unit of service rendered. So the principal of unit costing is used in operating costing.

4.2 MEANING OF OPERATING COSTING

Operating costing is a method of ascertaining the cost of providing or operating a service. It is also known as service costing CIMA London, defines Operating Costing as "that form of operation costing which applies where standardized services are rendered either by an undertaking or by a service cost renter with in an undertaking".

4.2.1 Cost Unit:

Determining the suitable cost unit to be used for cost ascertainment is a major problem in service costing. Selection of a proper cost unit is a difficult task. A proper unit of cost must be related with reference to nature of world and the cost objectives. The cost unit related must be simple i.e. per bed in a hospital, per cup of tea sold in a canteen and per child in a school. In a certain cases a composite unit is used i.e. Passenger – Kilometer in a transport company. The following are some of example of cost units used in different organizations

Enterprises	**Cost per unit**
Passenger transport	Kilometer
Goods transport	Ton – Kilometer
Hotel	Per room per day
Hospital	Per bed per day
Canteen	Per item, per meal
Water supply	Per 1000 liters
Electricity	Per kilowatt

4.2.2 Collection of costing data:

After determining the cost unit, the cost relating to the service is collected. The collected cost is a presented under the heads suitable for control purpose i.e. fixed expenditure and variable expenditure. The presentation of cost data under difficult categories helps to improve managerial control over cost.

4.3 TRANSPORT COSTING

4.3.1 Meaning

Transport costing is method of ascertaining the cost of providing service by a transport undertaking. This includes air, water, road and railways; motor

transport includes private cars, carriers for owners, buses, taxies, carrier Lorries etc. The objective of motor transport costing may be summarized as follows:

- to ascertain the operation cost of running a vehicle
- to provide and accurate basis for quotation and fixing of rates
- to provide cost companion between own transport and alternative e.g. hiring
- to compare the cost of monitoring one group of vehicle with another group
- to determine the cost to be changed against departments using the service
- to ensure the cost of maintenance and repairs is not excessive

4.3.2 Classification of costs:

Costs are classified into the following three heads:

1) Standing or Fixed Charges: These charges are includes whether vehicle is operating or not. Insurance, tax, depreciation and part of driver wages. Interest on capital, general supervision, and salary of operating managers is items come under the category of fixed or standing charges.

2) Maintenance charges: There are semi variable expenses in nature and include wear on tires, repairs and overheads painting etc.

3) Operating and running charges: Running costs are the cost of operations. These charges vary more or less in direct proportion to kilometers etc. These expenses are variable in nature because they are dependent on distance covered and trips made.

Though the above three classification is done, in practical it is difficult to distribute. It depends basically on the circumstances of each case e.g. if the salary paid to driver is on monthly basis then it is a fixed charged but if the same is limited to kilometer run then it is a running cost.

4.3.3 Collection of Cost Data:

Each vehicle is given a separate unique number and all the basic documents will contain the assigned number of the respective vehicles. A separate daily log sheet for each vehicle is maintains to record the details of trips, running time, capacity, distance cover, cost of petrol / diesel, lubricants, loading and unloading time etc on daily basis. A specimen of log sheet is given below:

Daily log sheet Table

Vehicle No.: ……. Route No.: …….

Date of Purchase: …….. Driver:

Make and Specification: …….

Time of Leaving: …….

License No.: …….. Time of Returning: …….

Trip no.	From	To	Packages		Kilometers	Time			Remarks
			Out	Collected		Out	In	Hrs	

Supplies Worker's time abnormal delays

Petrol / diesel ……Driver ……Loading / unloading ……

Oil ……conductor…….Accident …….

Grease ……Cleaner……Traffic Delays……..Others……...

Format of transport operating cost sheet:

Operating cost sheet

Vehicle No. : ……..... Period …….……

Cost Unit: …….. No. of Cost units ……..

Particulars	Rs.	Total Rs.	Per Km Rs.	
A. Fixed Cost (or Standing charges)				
1. Road Tax	xx		xx	
2. Insurance	xx		xx	
3. Driver's Salary	xx		xx	
4. Conductor's Salary	xx		xx	
5. Depreciation	xx		xx	
6. Interest on Capital	xx		xx	
7. Garage Rent	xx		xx	
8. Office & Administration Overheads	xx	xx	xx	xx
B. Variable (Running) costs				
Depreciation	xx		xx	
Petrol Diesel	xx		xx	
Oil & Grease	xx		xx	
Repairs and maintenance	xx		xx	
Tyres and tubes	xx	xx	xx	xx
Total operating cost		**xxx**		**xxx**

Note: Maintenance expenses can be shown separately also depends on cases.

Check Your Progress:

1) Give the format of Transport Operating cost-sheet

_____

_____

_____

_____

2) Give the specimen of log sheet

3) Give the Cost Unit of the following
   a) Passenger Transport b) Good Transport c) Electricity
   d) Hospital e) Hotel

4) Explain the following terms
   a) Standing or Fixed Charges b) Maintenance charges
   c) Operating and running charges d) Transport costing
   e) Operating costing

4.4 SOLVED PROBLEMS OF TRANSPORT COSTING

Illustration 1:

From the following information calculate fare for passenger KM.

The cost of the Bus	Rs. 450000
Insurance charges	3 % p.a.
Annual tax	Rs. 4500
Garage rent	Rs. 500 p.m.
Annual repairs	Rs. 4800
Expected life of the bus	5 yrs
Value of scrap at the end of 5 years	Rs. 3000
Route distance	20 km long
Driver's salary	Rs. 550 p.m.
Conductor's Salary	R. 500 p.m.
Commission to Driver & conductor (shared equally)	10 % of the takings
Stationary	Rs. 250 p.m.
Manager-cum-accountant's Salary	Rs. 1750 p.m.
Diesel and Oil (for 100 kms)	125

The bus will make 3 rounds trips for carrying on the average 40 passenger's in each trip. Assume 15 % profit on takings. The bus will work on the average 25 days in a month.

Solution

Operating Cost Statement

Bus No.

Capacity : 40 persons

Particulars	Per Annum Rs.	Per Annum Rs.	Per Annum Rs.
A. Standing Charges			
Depreciation	84,000		
Tax	4,500		
Insurance	13,500		
Stationery	3,000		
Manager's Salary	21,000	1,26,000	00.08750
B. Maintenance Charges			
Garage Rent	6,000		
Repairs	4,800	10,800	00.00750
C. Operating (or) Running Charges			
Diesel & Oil	3,750		
Driver' Salary	6,600		
Conductor's Salary	6,000	16,350	00.01135
Total		1,53,150	00.10635
Add : Commission and Profit 25/75			00.03545
Fare per passenger km.			00.14180

Working Note:

1) No. of Km run in a month : 3 x 2 x 20 x 25 = 3000 km

2) No. of passenger km per annum : 3000 x 40 x 12= 14,40,000

3) Diesel and oil: 3000 x 125 / 100 = Rs. 3750

4) Commission & Profits: Commission 10 % of taking + profit 15 % of Taking total = 25 % of taking so the cost

Cost is only 75 %

Illustration 2 :

From the following data relating to two different vehicles A and B, compute cost per running mile.

	Vehicle A	Vehicle B
Milage run (annual)	15000	6000
Cost of vehicles	Rs. 25000	Rs. 15000
Road License (Annual)	750	750
Immune (Annual)	700	400
Garage rent (Annual)	600	500
Supervision and Salaries (Annual)	1200	1200
Driver's wage per hour	3	3
Cost of fuel per gallon	3	3
Miles runs per gallon	20	15
Repairs and maintenance per mile (Rs.)	1.65	2.00
Tire allocation per mile	0.80	0.60
Estimated life of vehicle (miles)	1,00,000	75,000

Charge interest @ 5 % p.a. on cost of vehicles. The vehicles run 20 miles per hour on an average

[M. Com. Madurai Kamraj]

Solution :

Operating cost sheet (cost per mile)

Particulars			Vehicle-A	Vehicle-B
A. Operating and Maintenance Charges				
Depreciation A – 25000 / 100000			0.25	--
B – 15000 / 75000			--	0.20
Repairs and maintenance			1.65	0.20
Tire allocation			0.80	2.00
Fuel (3 / 20 miles)			0.15	0.60
Driver's wages (A – 3 / 20) (3 – 3 / 15)			0.15	0.15
			3.00	3.15
B. Standing Charges				
	A	B		
Road license	Rs.	Rs.		
	750	750		
Insurance	700	400		
Charges	600	500		
Supervision	1200	1200		
Interest @ 5 % p.a.	1250	750		
	4500	3600		
Mileage run per annum	15000	6000		
Fixed standing charge per mile	0.30	0.60	0.30	0.60
Operating cost per mile			3.30	3.75

Note :

1) Depreciation is linked with mileage so operating cost.
2) Driver wage is taken as operating since it is paid per hour.

4.5 HOSPITAL COSTING

Hospitals comes under service sector, big companies also maintain hospitals. For costing purpose the hospital service can be divided in two following categories.

1) Outpatient department
2) Wards
3) Medical service departments such as radio therapy 'X' ray etc.
4) General Services such as heating, lighting, catering laundry etc.
5) Other services such as transport, dispensary, cleaning etc.

4.5.1 Cost Statement:

The expenses of hospital can be broadly divided into two categories i.e. (1) Capital Expenditure and (2) Maintenance Expenditure – this includes salaries and wages, provision, staff uniforms clothing, medical and surgical appliances and equipments, fuel light and power, laundry, water etc.

4.5.2 Format of a cost Sheet of a Hospital:

Particulars		Rs.	Rs.
A)	Fixed standing charges		
	Rent	xx	
	Repairs and maintenance	xx	
	General administrative expenses	xx	
	Depreciation	xx	
	Salaries to staff	xx	
	Cost of Oxygen, X ray etc.	xx	**xx**
B)	Running or maintenance costs		
	Doctor's fees	xx	
	Food	xx	
	Medicines	xx	
	Laundry	xx	
	Hire charges	xx	**xx**
	Total operating cost		**xx**

Cost per patient day = $\frac{\text{Total Operating cost}}{\text{No of Patient Days}}$

4.6 SOLVED PROBLEMS ON HOSPITAL COSTING

Illustration 3:

The following information is available from a intensive care unit. Rent (including repairs) Rs. 10000 p.m.

The unit cost consists of 25 beds and 5 more beds can be accommodate when the occasion demands. The permanent staff attached to the unit is as follows:

2 supervisors each at a salary or Rs. 2000 per month.

4 nurse each at a salary of Rs. 1500 per month.

2 ward boys each at a salary of Rs. 1000 per month.

Though the unit was open for the patients all the 365 days in a year, security of accounts of 2008 revealed that only 150 days in a year the unit had the full capacity of 25 patients per day and for another 80 days it had on an average 20 beds only occupied per day. But there were occasions when the beds were full, extra beds were hired from outside at a charge of Rs. 10 per bed per day and this did not come to more than 5 beds extra above the normal capacity any one day. The total hire charges for the whole year were Rs. 4000.

The unit engaged expert doctor from outside to attend on the patients and the fees were paid on the basis of number of patients attended at time spent by them on an average worked out to Rs. 2000 per month in 2008. The other expenses for the year were as under.

	Rs.
Repairs and maintenance	8,000
Food supplied to patients	1,00,000
Janitor and other services for patients	25,000
Laundry charges for bed linens	40,000
Medicines supplied	70,000
Cost of oxygen, x ray etc other than directly born for treatment of patients (Fixed)	90,000
General administration charges allocated to the unit	1,00,000

1) If the unit recovered an overall amount of Rs. 200 per day on an average from each patient what is the profit per patient day made by the unit in 2008.

2) The unit wants to work out a budget for 2009, since the number of patients is very uncertain, annuity the same revenue and expenses prevail in 2009, work out the number of patient days required break-even.

Solution :

Statement of cost and profit

	Particulars	Rs.	Rs.
A)	Income received (Rs. 200 x 6150)		1,23,000
B)	Variable cost (per annum)		
	Food	1,00,000	
	Janitor and other services	25,000	
	Laundry charges	40,000	
	Medicines	70,000	
	Doctors fees (20,000 x 12)	2,40,000	
	Hire charges for extra bed	4,000	
	(B)	4,79,000	
C)	Fixed Costs		
	Salaries		
	Supervisor	4,800	
	Nurses	72,000	
	Ward boys	24,000	
	Rent (10000 x 12)	1,20,000	
	Repairs & Maintenance	8,000	
	General administration	1,00,000	
	Cost of oxygen, X ray etc.	90,000	
	(C)	4,62,000	
	Total cost (B + C)		9,41,000
	Profit		**2,89,000**

Profit per patient day = $\frac{28900}{6150}$ = 46.91 loss Rs. 47/-

Working Note: Calculation of No. of patient days in 2008

25 beds x 150 days = 3750
20 beds x 80 days = 1600
Extra beds 4000 ÷ 5 = 800
6150

Breakeven point = $\frac{\text{Fixed Cost}}{\text{Income – Variable cost}}$ x income = $\frac{46200}{751000}$ x 1230000

= Rs. 756671 (or) $\frac{756671}{200}$ = 3783.25 patient days

4.7 HOTEL COSTING

Hotel industry is a service industry and covers various activities such as provision for food and accommodation. It also provides other comforts like recreations, business facilities, shopping areas etc. The expenses incurred in a hotel are fixed or variable. Fixed expenses comprises of staff salaries, repairs, interior decoration, laundry contract cost, sundries and depreciation on fixed assets. The variable expenses incurred are lighting, attendants' salaries, power etc. To find out room rent to be charged from customers a notional profit is added with the cost and divided by the number of rooms

available. The number of rooms available is calculated after for considering availability of suits and occupancy.

Rooms rent may be different from season to season. Sometime besides accommodation they also provide food. Then the cost of meals, other direct and indirect costs are considered to work out the costs to be charged from customers.

Operating cost sheet of a Hotel:

Particulars		Rs.	Rs.
A)	Fixed Charge		
	Salaries to Staff	xx	
	Repairs and Renovation	xx	
	Depreciation	xx	
	Interior decoration	xx	
	Sundries	xx	
	Laundry contract cost	xx	
	Rent	xx	xx
B)	Running charges (Variable cost)		
	Power	xx	
	Attendant salaries	xx	xx
	Total Operating Cost		xx
	No. of Room Days		xx
	Cost per Room Days		xx

Check Your Progress

1) Give the formats of the following:
   a) Operating Cost Sheet of a Hospital
   b) Operating cost sheet of a Hotel

_____

_____

_____

_____

_____

2) Enlist the categories of Hospital services.

_____

_____

_____

_____

_____

3) Which expenditures are included in Maintenance Expenditure in case if hospital costing?

_____

_____

_____

_____

_____

4) Find out if the following expenses are Fixed expenses or variable expenses in case of Hotel costing:.

a) Staff salaries
b) Repairs
c) Interior decoration
d) Laundry contract cost
e) Sundries
f) Depreciation on fixed assets
g) Lighting
h) Attendants' salaries
i) Power

4.8 SOLVED PROBLEMS ON HOTEL COSTING

Illustration 4:

A company runs a holiday home for this purpose it hired a building at a rent of Rs. 10,000 per month along with 5% of total takings. It has three types of suites for its customer's viz. single room, double room and triple rooms.

Following information is given:

Types of suite	**Number**	**Occupancy percentage**
Single rooms	100	100 %
Double rooms	50	80 %
Triple rooms	30	60 %

The rent of double room's suite is to be fixed at 2.5 times of the single room and that of triple rooms at twice of the double room suite.

The other expenses for the year 2009 are as follows:

	Rs.
Staff salaries	14,25,000
Room attendants wages	4,50,000
Lighting heating and powers	2,15,000
Repairs and renovations	1,23,500
Laundry charges	80,500
Interior decoration	74,000
Sundries	1,53,000

Provide profit @ 20 % on total takings and assume 360 days in a year. You are required to calculate the rent to be charged for each type of suite

[C. A. PE II]

Solution:

Calculation of room occupancy

Type of suite	Number	Occupancy %	No. of days in a year	Room occupancy days
Single Room	100	100	360	36000
Double Room	50	80	360	14400
Triple Room	30	60	360	6480

Calculation of equalant single room suits occupancy

36,000 x 1 + 14400 x 2.5 + 6480 x 5 = 104400

Calculation of Total Cost :

	Rs.
Staff salaries	14,25,000
Room attendant wages	4,50,000
Lighting heating and power	2,15,000
Repair and renovation	1,23,500
Laundry charges	80,500
Interior decoration	74,000
Sundries	1,53,000
Total cost excluding building rent	25,21,000
Building rent = 10000 x 12 + 5% of taking	2,96,066
Total cost	28,17,066
Profit 20 % of takings	7,04,267
Total takings	35,21,333

Rent for a single room = 3521333 ÷ 104400 = Rs. 33.73

Rent for a double room = 33.73 x 2.5 = Rs. 84.325

Rent for a triple room = 84.325 x 2 = Rs. 168.65

4.9 EXERCISE

Objective Type

Choose the correct answer for the multiple choice questions

1) Classification and accumulation of costs by fixed and variable costs is a distinctive feature of

a) Process costing b) Unit costing

c) Operating costing d) Batch costing

2) Composite unit is distinctive feature of
   a) Single or output costing b) Process costing
   c) Job costing d) Operating costing

3) Electricity generating company should employ
   a) Unit costing b) Process costing
   c) Operating costing d) Multiple costing

4) Cinema houses must adopt
   a) Operating costing b) Job costing
   c) Batch costing d) Contract costing

5) For a library the best method of costing suitable is
   a) Output costing b) Operating costing
   c) Process costing d) Multiple costing

6) For an educational institutes the right method of costing is
   a) Output costing b) Job costing
   c) Operating costing d) Process costing

7) Hospitals must make use of
   a) Operating costing b) Batch costing
   c) Process costing d) Multiple costing

8) For hotels the best method of costing is
   a) Single or output b) Contract costing
   c) Process costing d) Operating costing

9) Air India Co. must make use of
   a) Job costing b) Operating costing
   c) Batch costing d) Process costing

10) Indian Railways must adopt
   a) Operating costing b) Unit costing
   c) Batch costing d) Multiple costing

11) Public utility undertakings must invariably adopt
   a) Operating costing b) Output costing
   c) Contract costing d) Multiple costing

12) Karnataka Electricity Board must make use of
   a) Single or output costing b) Job costing
   c) Process costing d) Operating cost

13) The method of costing used in case of a gas company is termed as

a) Job costing b) Process costing

c) Operating costing

14) Mines 'A' and `B' are at a distance of 10 kms and 15 kms from the factory. The cost per tone-km in case of mine A is Rs. 3 while it is R. 2.5 in case of mine B. The factory should procure coal from

a) Mine A only b) Mine B only

c) Both from mines A and B in the ration of 3 : 2

15) In case of steam company, the cost per unit is calculated on the basis of

a) Total quantity of lbs. produced

b) Total quantity of kwh. generated

c) Total quantity of tones produced.

Answers: 131(c), 2(d), 3(c), 4(a), 5(b), 6 (b), 7(a), 8(d), 9(b), 10(a), 11(d), 12(a) (c), 14 (a), 15(a)

4.10 QUESTIONS

Simple Questions

1. Define operating cost
2. Define operating costing
3. Distinguish between operating cost and operating costing
4. What do you mean by a composite unit?
5. List out any eight undertakings which makes use of operating costing.
6. Give the composite unit of the following undertakings :
   a) Roadways carrying passenger
   b) Railways carrying goods
   c) Hospital and
   d) College.
7. Mention the basis of classifying the cost under operating costing.
8. Mention the basis of classifying the costs under transport costing.
9. What is a log sheet?
10. What do you mean by cost summary performance statement?
11. What do you mean by absolute tone-kilometer?

12. What do you mean by a commercial tone-kilometer?

13. Distinguish between absolute tone-kilometer and commercial tone kilometer.

14. What do you mean by "kilometer run"?

15. What do you mean by "cost per hour" under operating costing?

State whether each of the following statement is `True' or `False'

1. Operating costing is used in case of service undertaking.

2. Log sheet is prepared in case of power house costing.

3. The unit of cost for production of steam may be per lb.

4. Per man show cost is calculated in case of Canteen costing. 5. Fare in case of taxis is generally based on cost per passenger, km

Answer : (1) True (2) False (3) True (4) False (5) False

Long answer type

1. What is service costing? Mention the types of business in which the system would be suitable. Describe briefly a system of service costing which you would recommend for use by a passenger taxi service.

2. What are the main objects of motor transport costing? A company owns a fleet of vans and wishes to examine the cost of (a) each van, (b) the fleet as a whole. Prepare a report on the accounting arrangements that are needed and draft specimen of the forms that you recommend for presentation to the directors. Show separate rates for fixed and variable expenditure and state how these should be used.

3. Draw up a proforma cost statement for a canteen serving 1,000 workers in a factory. The canteen is subsidized by the factory.

4. What is "Operating Costing"? State the industries where it is to be used?

5. What is a "Log sheet"? Give its proforma.

6. Your client running a canteen tends to introduce costing system in his organization. How should he classify his costs for the purpose of preparing an Operating Cost Statement?

❄❄❄❄❄❄❄

5

OPERATING COSTING - II

Unit Structure

5.0 OBJECTIVES

After studying the unit the students will be able to solve the problems on transport costing, Hospital costing and Hotel costing.

5.1 PROBLEMS AND SOLUTION

Illustration 1:

SAITRAVELS owns a bus and operates a tourist service on daily basis. The bus starts from New City to Rest village and returns back to New City the same day. Distance between New city and Rest village is 250 kms. This trip operates for 10 days in a month. The bus also plies for another 10 days between New city and Shivapur and returns back to New city the same day, distance between these two places is 200 kms. The bus makes local sightseeing trips for 5 days in a month, earning a total distance of 60 kms per day.

The following data are given.

Cost of bus	Rs. 3,50,000
Depreciation	25 5
Driver's salary	Rs. 1,200 p.m.
Conductor's Salary	Rs. 1,000 p.m.
Part time clerk's salary	Rs. 400 p.m.
Insurance	Rs. 1,800
Diesel consumption 4 kms per litre @	Rs. 8 per litre
Token tax	Rs. 2,400 p.m.
Permit fee	Rs. 1,000 p.m.
Lubricant oil	Rs. 100 for every 200 kms
Repairs and maintenance	Rs. 1,500 p.m.
Normal capacity	Rs. 50 persons

While playing to and for Rest village, the bus occupies 90% of the capacity and 80% when it plies between New city to Shivapur (both ways). In the city the bus runs full capacity passenger tax is 20 % of net takings of the "Travels" firm.

Calculate the rate to be charged to Rest village and Shivaupr from New city, per passenger, if the profit required to be earned is 33 % of net taking of firm.

[I.C.W.A., Intermediate]

Solution:

Operating cost statement for the month

	Rs.	Total Rs.	Per passenger km (total cost + 4,00,000) passenger km Rs.
		Rs.	
Fixed charges			
Driver's salary	1,200		
Conductor's salary	1,000		
Clerk's salary	400		
Insurance (1,800 ÷ 12)	150		
Token Tax (2,400 ÷ 12)	200		
Permit fees	1,000		
Depreciation (25% of 3.5lakhs÷ 12)	7,292		
Repairs and Maintenance	1,500	12,742	0.03185
Running charges			
Diesel cost 9,300 km ÷4=2,325 liters @ Rs. 8		18,600	0.04650
Lubricant oil 9,300km÷200=45.5 liters@ Rs.100		4,650	0.01163
Total		35,992	0.08998
Add : 33 % profit on net taking or 49.25% on cost		17,726	0.04432
Net takings		53,718	0.13430
Add : 20 % for passenger tax		10,744	0.02686
Total		64,462	0.16116
		or say	0.161

Charges per passenger:

a) to Rest village from New city : 250 x 0.161 i.e. Rs. 40.25

b) to Shivapur from New city : 200 x 0.161 i.e. Rs. 32.20

* total kms covered p.m.

Rest village and back 2 x 250 x 10 days	5,000
Shivapur and back 2 x 200 x 10 days	4,000
Local trips @ 60 kms for 5 days	300
	9,300

** Total effective passenger – km per month :

Rest village 2 x 250 x 90 % of 50 x 10 days = 2,25,000 passenger km

Shivapur 2 x 200 x 80 % of 50 x 10 days = 1,60,000

Local Trips 5 x 60 x 50 = 15,000

4,00,000

Illustration: 2:

(Service costing – use own / company cars or hire cars)

A company is considering three alternative proposals for conveyance facilities for its sales personal who have to do considerable travelling, approximately 20,000 kilometers every year. The proposals are as follows :

1) Purchase and maintain its own fleet of cars. The average cost of car is Rs. 1,00,000.

2) Allow the executive use his own car and reimburse expenses at the rate of Rs. 1.60 paise per kilometer and also bear insurance costs.

3) Hire cars from an agency at Rs. 20,000 per year per car. The company will have to bear costs of petrol, taxes and tyres.

The following further details are available :
Petrol Re. 0.60 per km.

Repairs and maintenance Re. 0.20 per km
Tyre Re. 0.12 per km

Insurance Rs. 1,200 per car annum;

Taxes Rs. 800 per car per annum

Life of a car : 5 years with Annual milage of 20,000 kms. Resale value: Rs. 20,000 at the end of the fifth year.

Work out the relative costs of three proposals and rank them

[C.A., Inter]

Solution :

Alternative proposals

	I Use of concern car		II Use of own car	III Use of hired car
	Rs. Per annum	Rs. Per km	Rs. Per km	Rs. Per km
Reimbursement (A)	--	--	1.60	1.00 @
Fixed cost (B)				
Per car per annum				
Insurance	1,200			
Taxes	800			
Depreciation (Rs.1,00,000–20,000÷ 5)	16,000			
Total	18,000			
Fixed cost per km (Rs.18,000 ÷ 20,000 km)		0.90	--	--
Running and maintenance cost (C)				
Per car per km				
Petrol		0.60	--	0.60
Repairs & Maintenance		0.20	--	--
Tyre		0.12	--	0.12
Total cost per km (A+B+C)		1.82	1.66	1.76
Cost of 20,000 km		Rs. 36,400	33,200	35,200
Ranking of alternating proposals		III	I	II

Decision II alternating i.e., use of own car will be the best alternative from company's point of view. III alternative i.e. hiring the card is 2nd best alternative. I alternative i.e. maintaining the fleet will be costliest alternative.

Rs. 1,200 ~ 20,000 kms = Re. 0.06; (Rs. 800 ~ 20,000 kms) = Re. 0.04 @ Rs. 20,000 ~ 20,000 kms = Re. 1/-

Illustration 3:

The Union Transport Company has been given a twenty kilometer long route to ply a bus. The bus costs the company Rs. 1,00,000. It has been insured at 3 % per annum. The annual road tax amounts to Rs. 2,000. Garage rent is Rs. 400 per month. Annual repair is estimated to cost Rs. 2,360 and the bus is likely to last for five years.

The salary of the driver and conductor is Rs. 600 and Rs. 200 per month respectively in addition to 10% of the taking as commission to be shared equally by them. The managers salary is Rs. 1,400 per month and stationery will cost Rs. 100 per month. Petrol and oil will cost Rs. 50 per 100 kilometers. The bus will make three round trips per day carrying on an average 40 passengers in each trip. Assuming 15% profit on takings and that the bus will ply on an average 25 days in a month.

Prepare operating cost statement on a full year basis and also calculate the bus fare to be charged from each passenger per kilometer

[C.A., Inter]

Solution:

Union Transport Company

Statement showing operating cost of the bus per annum

A. standing charges			
Managers salary (Rs. 1,400 x 12)	=	Rs.	16,800
Driver's salary (Rs. 600 x 12)	=	Rs.	7,200
Conductor's Salary (Rs. 200 x 12)	=	Rs.	2,400
Road Tax	=	Rs.	2,000
Insurance (3% of Rs. 1,00,000)	=	Rs.	3,000
Garage rent (Rs. 400 x 12)	=	Rs.	4,800
Stationery (Rs. 100 x 12)	=	Rs.	1,200
Depreciation (Rs. 1,00,000 ÷ 5 years)	=	Rs.	20,000
			57,400
B. Maintenance Cost – Repairs	=	Rs.	2,360
C. Running charges			
Petrol and oil (36,000 km x Rs. 500) ÷ 100	=	Rs.	18,000
Total costs (A + B + C)	=	Rs.	77,760
Add : 10 % of takings for commission of driver & conductor	=	Rs.	
15 % profit – desired on takings	=	Rs.	25,920
25 % on total takings = 33 – 1/30 of cost	=	Rs.	1,03,680

Calculation of bus fare to be charged:

Effective passenger kilometers:

(2 x 20 km x 3 trips x 40 passengers x 25 days x 12 months) = 14, 40,000

Rate to be charged per km from each passenger

Rs. 1, 03,680 ~ 14,40,000 = Re. 0.072

Calculation of total distance covered

(20 km 2 x 3 x 25 x 12) = 36,000 km per annum

Illustration 4: (Transport Costing)

Prakash Automobiles distributes its goods to a regional dealer using a single lorry. The dealers' premises are 40 kilometers away by road. The lorry has a capacity of 10 tons and makes the journey twice a day fully loaded on the outward journeys and empty on return journey. The following information is available for a four weekly period during the year 1990.

Petrol consumption	8 km per liter
Petrol Cost	Rs. 13 per liter
Oil	Rs. 100 per week
Driver's wages	Rs. 400 per week
Repairs	Rs. 100 per week
Garage Rent	Rs. 150 per week
Cost of Lorry (excluding tyres)	Rs. 4,50,000
Life of Lorry	80,000 kilometers
Insurance	Rs. 6,500 per annum
Cost of tyres	Rs. 6,250
Life of tyres	25,000 kilometers
Estimated sale value of lorry at end of its life	Rs. 50,000
Vehicle license cost	Rs. 1,300 per annum
The lorry operates on five day week	Rs. 41,600 per annum

Required:

a) A statement to show the total cost of operating the vehicle for four-weekly period analyzed into running costs and fixed costs.

b) Calculate the vehicle cost per kilometer and per ton kilometer

[C.A., Inter]

Solution:

a) Before computing the total cost, it is necessary to find out the basic data s under :

1) Distance travelled in 4 week period; 40 km one way x 2 (return) x 2 trips x 5 days x 4 weeks = 3200 km

2) For tone km working = empty on return and as such for tone km = 3200 ÷ 2 = 1,600

3) Total consumption in weeks = 3,200 km ÷ 8 km = 400 lt

4) Tyre cost = (Rs. 6,250 ÷ 25,000 km) x 3,200 km = Rs. 800

5) Depreciation of lorry in 4 weeks

= (Rs. 4, 50,000 - Rs. 50,000 km) ÷ 80,000 x 3,200 = Rs. 16,000

Operating cost statement f a lorry of M/s. Prakash Automobiles (for the 4 week period)

Running costs	**Rs.**
Cost of petrol (400 liters x Rs. 13)	5,200
Oil (Rs. 100 per week x 4)	400
Drivers wages (Rs. 400 per week x 4)	1,600
Repairs (Rs. 100 x 4)	400
Cost of tyers (as at 4 above)	800
Depreciation (as at 5 above)	16,000
Total running costs – (i)	24,400
Fixed costs	**Rs.**
Garage ret (Rs. 150 x 4)	600
Insurance (Rs. 6,500 ÷ 52) x 4	500
License cost (Rs. 1,300 ÷ 52) x 4	100
Other overheads (Rs. 41,600 ÷ 52) x 4	3,200
Total fixed cost - (ii)	4,400
Total (i) + (ii)	28,000

(b) Cost per tone – km = Rs. 28,800 ~ (1600 x 10 tons) Rs. 1.80

Illustration 5 :

A company presently brings coal to its factory from a nearby yard and the rate paid for transportation of coal from the yard located 6 kms. Away to factory is Rs. 50 per ton. The total coal to be handled in a month is 24,000 tones.

The company is considering proposal to buy its own trucks and has the option of buying either a 10 ton capacity or a 8 ton capacity trucks.

The following information is available:

	10 Ton Truck	**8 Ton Truck**
Purchase Price Rs.	10,00,000	8,50,000
Life (Years)	5	5
Scrap value at the end f 5th year	Nil	Nil
KM Per liter of diesel	3	4
Repair and maintenance p.a. per truck (Rs.)	60,000	48,000
Other fixed expenses p.a. (Rs.)	60,000	36,000
Lubricants and sundries per 100 km (Rs.)	20	20

Each truck will daily make 5 trips (to and fro) on an average for 24 days in a month. Cost of diesel Rs. 15/- per liter. Salary of driver Rs. 3,000/-, p.a. month. Two drivers will be required per truck. Other staff expenses Rs. 1,08,000 p.a.

Present a comparative cost sheet on the basis of above data showing transport cost per ton of operating 10 ton and 8 ton Truck at full capacity utilization.

[C.A. Final]

Solution :

Comparative statement of operating cost sheet :

	10 Ton Truck Rs.	8 Ton Truck Rs.
Fixed Charges (p.m.)		
Driver's Salary (working no. 1)	12,000	15,000
Staff expenses	9,000	9,000
Other fixed expenses	5,000	3,000
Operating & Maintenance Charges (p.m.)		
Depreciation (Note No. 2)	3,33,333	3,54,167
Diesel Cost (Note No. 3)	1,44,000	1,35,000
Lubricants & Sundries(Note No. 3)	5,760	7,200
Repairs & Maintenance	1,00,000	1,00,000
Total Cost (A)	7,17,093	7,58,367
Tons Carried (B)	24,000	24,000
Cost per ton (A/B)	29.87	31.59

Conclusion : A comparison of cost per ton by using 10 ton trucks is more economical. The cost paid for bringing coal per ton presently viz. Rs. 50/- is the highest.

Working Note :

		10 ton	8 ton
1	Total number o trucks and drivers required		
	Coal brought to the factory per month (5 x 24 x 10)	1200	--
	(5 x 24 x 8)		960
	No. of truck required to bring24,000 tons is	24000/1200=20	24000/960=25
	Total number of drivers required	20 x 2 = 40	25 x 2 = 50

2	Total monthly depreciation		
	Depreciation per truck per annum	2,00,000	1,70,000
	Depreciation per truck per month	1,666.66	14,166.66
	Total depreciation	16666.66 x 20 = 3,33,333	14166.66 x 25 = 3,54,167
3	Diesel requires		
	Total Km run per truck p.m. (6 km x 10 trips x 24 days)	1440	1440
	Total KM run by all trucks	28800	36000
	Km per liter of diesel	3	4
	Diesel required liters	9600 (28800 / 3)	9000 (36000 / 4)

Illustration.6:

You are required to calculate a suggested fare per passenger – km from the following information for a mini bus.

i) Length of route 30 km

ii) Purchase price Rs. 4,00,000.

iii) Part of above cost meet by loan, annual interest Rs. 10,000 p.a.

iv) Other annual charges : Insurance Rs. 15,000, Garage Rent Rs. 9,000, Road Taxes Rs. 3,000, Repairs and Maintenance Rs. 5,000. Administrative charges Rs. 5000.

v) Running expenses : Driver & Conductor Rs. 5000 p.m., Repairs / Replacement of tyre tube Rs. 3600 p.a. Diesel and Oil cost per Km Rs. 5/-

vi) Effective life of vehicle is estimated at 5 years at the end of which it will have a scrap value of Rs. 10,000.

vii) Mini Bus has 20 seats and is planned to make six two way trips for 25 days / p.m.

viii) Provide profit @ 20 % of total revenue.

[C.A., Final]

Solution :

Particulars	Cost per Annum Rs.	Cost Per Month Rs.
Fixed Expenses :		
Insurance	15,000	
Garage Rent	9,000	
Road Tax	3,000	
Administrative charges	5,000	
Depreciation (4,00,000–10,000 ÷ 5 years)	78,000	
Interest on Loan	10,000	
Total	1,20,000	10,000
Running Expenses :		
Repairs & Maintenance	15,000	1,250
Replacement of tyre tube	3,600	300
Diesel and oil cost (9000 km x Rs. 5/-)		45,000
Driver & Conductor's Salary		5,000
Total Cost per month		61,550
Add : Profit 20 % of total Revenue 25 % Total cost		15,387.50
Total Revenue		**76,937.50**

Rate per passenger km :

Rs. 36937.50 / 1,80,000 passenger km = 0.4274305 or 0.43 paise

Workings:

Total distance travelled by mini bus in 25 days = 60 km x 6 trips x 25 days = 9000 km

Total passenger km = 9000 km x 20 seats = 1,80,000 passengers km

Illustration 7 :

Krishna Transport Ltd. Charges Rs. 150 per ton for its 10 ton lorry load from city A to city B. the charges for the return journey are Rs. 140 per ton. No concession is made for any delivery of goods at intermediate station 'C' in January 2008. The truck made 10 outward journeys for city B with full load of which 2 ton were unloaded twice at city 'C'. The truck carried a load of 12 ton in its return journey for 4 times but once caught by police and Rs. 1500 was paid as fine. For the remaining trips it carried full load out of which all the goods on load were unloaded once at city 'C'. The distance from city A to city A and city 'B' are 150 km and 250 km respectively. Annual fixed cost are Rs. 1,20,000 and maintenance cost is Rs. 15,000. Running charges spent during January 2008 are Rs. 3500.

Calculate the cost per tone-kilometer and the profit for January 2008.

Solution :

Operating Cost and Profit Statement of Krishna Transport Ltd.

Particulars	Rs.
1. Fixed cost (12000 / 12)	
2. Maintenance charges 15000 / 12	
3. Running charges	
Total operating cost	
Cost per ton km	
Net revenue received (working note)	
Less : Total operating cost	
Profit	

(1) Tone km on outward journeys

From city A to C–10 journeys x10 ton x 150 km	=	15,000	
From city C to B–8 journeys x 10 ton x 100 km	=	8,000	
2 journey x 8 ton x 100 km	=	1,600	
Total		24,600	Tone – km

(2) Tone km on return journey

From city B to A – 4 journeys x 250 km x 12ton	=	12,000	
From city B to A – 5 journeys x 250 km x 10ton	=	12,500	
From city B to C - 1 journey x 100 km x 10 ton	=	1,000	
Total		25,500	Tone – km

Total tone km = 24,600 + 25,500 = 50,100 ton- km

(3) Net revenue received

From city A to B–10 journeys x10 ton X Rs.150	=	15,000	
From city B to A–4 journeys x 12 ton X Rs. 140	=	6,720	
From city B to A -5 journeys x 10 ton X Rs. 140	=	7,000	
From city B to C -1 journeys x 10 ton X Rs. 140		1,000	
Total		29,720	Tone – km
Less : Fine Paid		1,500	
Net revenue received		28,220	

Illustration 8 :

Mr. Sampath owns a fleet of taxies and the following information is available from the records maintained by him.

1) Number of Taxis – 10
2) Cost of each Taxi – Rs. 2,00,000
3) Salary of manager Rs. 6000 p.m.
4) Salary of Accountant Rs. 5000 p.m
5) Salary of cleaner Rs. 3000 p.m.
6) Salary of Mechanic Rs. 4000 p.m.
7) Garage Rent Rs 7000 p.m.
8) Insurance premium 5 %
9) Annual Tax Rs. 6000 per taxi
10) Drivers Salary Rs. 4000 p.m.
11) Annual Repairs Rs. 15,000 per taxi

Total life of a taxi is about 2,00,000 kms. A taxi runs in all 3000 kms. in a month of which 25 % its runs empty. Petrol consumption is one liter for 10 kms @ Rs. 40 per liter. Oil and other sundries are Rs. 10 per 100 kms.

Calculate the cost of running a taxi per km.

Solution:

Operating cost sheet

Particulars	Amount per month Rs.	Cost per Km Rs.
Fixed Expenses (for the whole fleet)		
Salary of manager	6000	
Salary of accountant	5000	
Salary of Cleaner	3000	
Salary of mechanic	4000	
Garage Rent	7000	
Insurance premium 5 % on Rs. 2,00000 x 10	8333	
Tax 6000 x 10 / 12	40000	
Total Fixed Expenses	5000	
Effective kilometer 3000x10x 75 % = 22,500		
Fixed expenses per km		3.48147
Running expenses (per taxi)		
Depreciation (2,00,000÷200000 x 10 x 3000)		1.33333
Repairs (15,000 x 10 ÷ 12)		0.55555
Petrol (3000 x 40) ÷ (10 x 22500)		0.53333
Oil and other sundries (10 x 3000) ÷ (100(22500)		0.13333
Cost per km		**6.03701**

Illustration 9:

A lodging home is being run in a small hill station with 50 single rooms. The home offers concessional rate during six off season months in a year. During this period, half of the full room rent is charged. The management profit margin is targeted at 20% of the room rent. The following are the cost estimates and other details for the year ending 31st March, 1996 (assume a month to be of 30 days)

a) Occupancy during the season is 80%, while in the off season is 40% only.

(b) Expenses :

(i) Staff Salary (excluding room attendants)	Rs. 2,75,000
(ii) Repairs to buildings	Rs. 1,30,000
(iii) Laundry and linen	Rs. 40,000
(iv) Interior and tapestry	Rs. 87,500
(v) Sundry expenses	Rs. 95,400

c) Annual depreciation is to be provided for building at 5% and on furniture and equipments at 15% on straight line basis.

d) Room attendants are paid Rs. 5/- per room-day on the basis of occupancy of the rooms in a month.

e) Monthly lighting charges are Rs. 120 per room, expect in four months of winter when it is Rs. 30 per room and this cost is on the basis of full occupancy for a month and

f) Total investments in the home are Rs. 100 lakhs of which Rs. 80 lakhs relate to buildings and balance for furniture and equipments.

You are required to work out the room rent chargeable per day both during the season and the off-season months, on the basis of the foregoing information.

[I.C.W.A., Intermediate

Solution:

Total estimated costs for the year ending 31.03.1996

Particulars		Total Rs.	Per room day (Rs.)
Salary		2,75,000	
Repairs		1,30,000	
Laundry and linen		40,000	
Interior decoration		87,500	
Depreciation:	Rs.		
Building 5% on 80 lakhs =	4,00,000		
Furniture 15 % on 20 lakhs =	3,00,000	7,00,000	
Miscellaneous expenses		95,400	
Attendant's salary		54,000*	
Lighting charges		36,000**	
Total cost		14,18,400 / 9000 *** full room days	157.60
Add : Profit margin at 20% on rent or 25% of cost			197.00

During season room rent is Rs. 197 and during off-season room rent is Rs. 98.50

* Attendant' salary

For 10,800 room days @ Rs. 5 per day = Rs. 54,000

** Total light bill

Light bill during 8 months at Rs. 120 per month or 120 ÷ 30 = Rs. 4 Per room day.

Light bill during 4 months of winter at Rs. 30 per month or 30 ÷ 30 = Re. 1 per Room day.

Total light bill for full one year	**Rs.**
During season @ Rs. 4 for 7,200 days	28,800
During 2 months of off-season	
@ Rs. 4 for 1,200 days (2 ÷ 6 x 3,600)	4,800
During 4 months of winter at Re. 1	
For 2,400 days (4 ÷ 6 x 3,600)	2,400
Total	36,000

*** Number of room days in a year :
Seasons occupancy for 6 months@80% (50 x 0.8 x 6 x 30) = 7,200 room days Off season's occupancy for 6 months @ 40 % (50 x 0.4 x 6 x 30) = 3,600 room days

Total room days during the Year	10,800
Total full room days in terms of rate	
Season	7,200
Off Season (in terms of 50 % rate on 3,600 days)	1,800
Total Full room days	9,000 per annum

Illustration 10:

Elegant Hotel has a capacity of 100 single rooms and 20 double rooms. It has a sports centre with a swimming pool which is also used by persons other than residents of the hotel. The hotel has a shopping arcade at the basement and a specialty restaurant at the roof top. The following information is available:

1) Average occupancy : 75 % for 365 days of the year

2) Current costs are :

	Variable cost	**Fixed cost**
Single room	400	200
Double room	500	250

3) Average sales per day of restaurant Rs. 1, 00,000; contribution is at 30 %. Fixed cost Rs. 10, 00,000 per annum.

4) The sports centre / swimming pool is likely to be used by 50 non – residents daily; average contribution per day per nonresident is estimated at Rs. 50; fixed cost is Rs. 5,00,000 per annum.

5) Average contribution per month from the shopping arcade is Rs. 50,000; fixed cost is Rs. 6, 00,000 per annum.

You are required to find out:

a) Rent chargeable for single and double room per day, so that there is a margin of safety of 20 % on hire of rooms and that the rent for a double room should be kept at 120 % of a single room.

b) Evaluate the profitability of restaurant, sports centre and shopping arcade separately.

[C. A. Final]

Solution:

(a) Statement for calculating the rent chargeable for single and double room per day.

	Occupancy days in a year Refer to working note (1)	Variable cost Rs / Days (2)	Fixed cost Rs / Days (3)	Total variable cost 4 = (1) x(2)	Total fixed cost (Rs.) 5=(1)x(3)	Total cost (Rs.) 6 = (4) x (5)
Single room	27,375	400	200	1,09,50,000	54,75,000	1,64,25,000
Double room	5,475	500	250	27,37,500	13,68,750	41,06,250
Add : 20 % margin of safety on hire of room or 25 % of total cost						51,32,812
Total amount of room rent to be received						2,56,64,062

Rent per day of single room 9in Rs.) 756 (approx)
(Refer to working note 2)
(Rs. 2, 56,64,062 / 33,945)

Rent per day of double room (in Rs.) 907 (approx)
(Rs. 756 x 1.2 times)

b) Profitability of restaurant	Rs.
Total sales per annum 365 days x Rs. 1,00,000	3,65,00,000
Contribution per annum (30 % of Total Sales) : (A)	1,09,50,000
Fixed cost per annum : (B)	10,00,000
Profit [(A) – (B)]	99,50,000
Profitability of sports centre :	**Rs.**
Contribution of sports centre per day : (50 persons x Rs. 50)	2,500
Total contribution per annum (Rs. 2,500 x 365 days) : (A)	9,12,500
Fixed cost per annum : (B)	5,00,000
Profit : [(A) – (B)]	4,12,500
Profitability of shopping arcade :	**Rs.**
Contribution per annum (Rs. 50,000 x 12 months)	6,00,000
Less : Fixed Cost	6,00,000
Profit	Nil

Working Note :

1) Single room occupancy days in a year = 100 room x 365 days x 75% = 27,375

   Double room occupancy days in a year = 20 rooms x 365 days x 75% = 5,475

2) In terms of single room total room occupancy days in a year
   = 27,375 + 1.20 % x 5,475 = 27,375 + 6,570
   = 33,945

Illustration 11:

Following are the information given by an owner of a hotel. You are requested to advice him that what rent should be charge from his customers per day so that he is able to earn 25 % on cost other than interest.

1) Staff salaries Rs. 80,000 per annum

2) Room attendant's salary Rs. 2 per day. The salary is paid on daily basis and services of room attendant are needed only when the room is occupied. There is one room attendant for one room.

3) Lighting, heating and power. The normal lighting expenses for a room if it is occupied for the whole month is Rs. 50. Power is used only in winter and normal charge per month if occupied for a room is Rs. 20.

4) Repairs to building Rs. 10,000 per annum

5) Linen etc. Rs. 4,800 per annum

6) Sundries Rs. 6,600 per annum

7) Interior decoration and furnishing Rs. 10,000 annually

8) Cost of building Rs. 4,00,000; rate of depreciation 5 %

9) Other equipments Rs. 1,00,000; rate of depreciation 10 %

10) Interest @ 5% may be charged on its investment of Rs. 5,00,000 in the building and equipment

11) There are 100 rooms in the hotel and 80 % of the rooms are normally occupied in summer and 30 % of the rooms are busy in winter. You may assume that period of summer and winter is six month each. Normal days in a month may be assumed to be 30.

Solution :

Operating cost sheet

Rent per day

	Rs.	Per annum Rs.
1. Staff salaries		80,000
Room attendant's salaries		
Summer 2 x (100 x 80 ÷ 100) x 30 x 6	28,800	
Winter 2 x (100 x 30 ÷ 100) x 30 x 6	10,800	39,600
Lighting, heating and power		
Summer 50 x 6 x (100 x 80 ÷ 100)	24,000	
Winter 50 x 6 x 100 x (30 ÷ 100)	9,000	
Power 20 x 6 x 100 x (30 ÷ 100)	3,600	36,600
Repairs to building		10,000
Linen etc.		4,800
Sundries		6,600
Interior decoration and furnishing		10,000
Depreciation : Building	20,000	
Other equipments	10,000	30,000
Interest on investment (5% on Rs. 5,00,000)		25,000
		2,42,600
Add : 25 % profit on cost other than interest Rs. 2,42,600 – Rs. 25,000 interest = Rs. 2,17,600		
Rs. 2,17,600 x 25 ÷ 100		54,400
Total cost		**2,97,000**

Rent per room for one day = Total Cost ÷ No. of room days
= 2, 97,000 ÷ 19,800
= Rs. 15 per day

Working Notes: Calculation of room days
No. of Rooms x Percentage x days in a month x no. of months

Summer:	100 x (80 ÷100) x 30 x 6	
	80 x 30 x 6	= 14,400
Winter:	100 x (30 ÷ 100) x 30 x 6	
	30 x 300 x 6	= 5,400
Total room days		= 19,800

5.2 EXERCISE

Practical problems

Illustration 1 :

A Mineral is transported from two mines – "A" and "B" and unloaded at plots in a Railway Station. Mine A is at a distance of 10kms. And B is at a distance of 1 5kms. from the mines. Records reveal that the lorries average a speed of 30 kms. per hour, when running and regularly take 10 minutes to unload at the railhead. At mine "A" loading time averages 30 minutes per load while at mine "B" loading time averages 20 minutes per load.

Drivers' wages, depreciation, insurance and taxes are found to cost 9 per hour operated. Fuel, oil, tyres, repairs and maintenance cost 1.20 per km.

Draw up a statement, showing the cost per tonne-kilometer of carrying mineral from each mine.

(M.Com. Oct. 01)

(Ans.: Cost per tonne Km. Mine A: Rs. 0.72, Mine B: Rs.0.66)

Illustration 2 :

A transport company maintains a fleet of bus as follows :

Number of Buses	Carrying Capacity
20	50 passengers each
10	40 passengers each

Each bus makes 5 trips a day, covering a distance of 10 Km. in each trip. On an average 80% of the seats are occupied in each trip and 5 buses are under repair every day. Assuming that the company operates its fleet daily, ascertain the operating cost per passenger-Km. from the following :

Wages of 30 Drivers	₹ 3,000 each per month
Wages of 30 Cleaners	₹ 1,000 each per month
Petrol	₹ 20,000 per month
Oil, Grease etc.	₹ 5,000 per month
Tyres, Tubes etc.	₹ 2,000 per month
Repairs	₹ 30,000 per year
Garage Rent	₹ 40,000 per year
Road Licences	₹ 20,000 per year
Taxes	₹ 5,000 per half year
Permit Fee	₹ 25,000 per year
Salary of Operating Manager	₹ 5,000 per month
Office Overheads	₹ 10,000 per year

(M.Com, Oct 2000)

Ans: (Total Operating Cost: Rs. 19,59,000, Cost per passenger Km.: Rs.0.1 15)

Illustration 3 :

A company presently brings coal to its factory from a nearby yard which is located 6 kms. away to factory and the rate paid ₹ 50 per ton for transportation. The total coal to be handled in month in 24,000 tons.

The company is considering proposal to buy its own trucks and has the option of buying either a 10 ton or a 8 ton capacity trucks.

The flowing information is available :

Particulars		10 Ton Truck	8 ton Truck
Purchase Price (`)	... ...	10,00,000	8,00,000
Life (Years)	... ...	5	5
Scrap value at end of 5th year	... ...	Nil	Nil
Kms. per litre of diesel	... ...	3	4
Rep/Maint p.a. per Truck (`)	... ...	60,000	48,000
Other Expenses fixed p.a. (`)	... ...	60,000	36,000
Lubricants and Sundries per 100 km. (`)	... ...	20	20

Each Truck will daily make 5 trips (to and fro) on an average for 24 days in a month.

Cost of Diesel ₹16 per litre.

Salary of Drivers ₹3,000 per month and two drivers will be required for a Truck.

Other staff expenses ₹1,08,000 p.a.

Present a Comparative Cost Sheet on the basis of above data showing transport cost per ton of operating 10 ton and 8 ton Truck at full capacity utilization.

(M.Com. Mar. 02, adapted)

Ans: (Total Operating Cost: 10 Ton Truck: Rs. 49,635 8 Ton Truck Rs.41,381, Cost per Ton: 10 Ton Truck: Rs. 41.36, 8 Ton Truck: Rs.43.1 1)

Illustration 4 :

The following were the expenses incurred by CALL and MALL Company in operating two lorries (for the conveyance of Raw Materials) and a bus (for the conveyance of Staff) during the month of February, 2006 :

	Monthly Cost		
	Lorry C	Lorry M	Bus
Driver's Salaries	110	115	120
Cleaner's Wages	120	120	60
Diesel	170	240	110
Oil	18	25	20
Repairs	150	150	100
Depreciation	330	220	350
Office Overheads	70	70	70
Servicing Charges	130	110	75
Road and Wheel Tax	45	45	30
Sundry Expenses	35	40	20

The above vehicles carried the following Raw materials and Passengers during the month :

Lorry C 100 Tonnes of Raw Material

Lorry M 120 Tonnes daily for 25 days

Respective mileage of the vehicles during the month :

Lorry C 3,000

Lorry M 4,500

Bus 2,000

From the above statistics prepare an Operating Cost Sheet in summary for the three vehicles. Also explain the unit of costing selected.

(M.Com., April 06, adapted)

Ans: (Total Operating Cost: Lorry C: Rs. 1,178, Lorry M: Rs. 1,135, Bus: Rs. 955,Total Tonnes or Passenger Miles: Lorry C: 12,000, Lorry M: 21,600, Bus: 50,000)

Illustration 5:

An entrepreneur owns a bus which runs from Mumbai to Pune and back for 25 days in a month. The distance from Mumbai to Pune is 170 kms. The bus completes the trip from Mumbai to Pune and back on the same day. Calculate the fare to be charged to the following further information is available :

Particulars		Rs.
Cost of Bus	... ...	3,00,000
Salary of Driver per month	... ...	1,050
Salary of Conductor	... ...	700
Fixed Office Overheads	... ...	480
Insurance p.a.	... ...	6,720
Diesel consumption 16 kms. per litre costing	... ...	25 per litre
Local Taxes p.a.	... ...	1.200
Oil and Lubricants per 100 kms.	... ...	20
Repairs and Maintenance p.a.	... ...	1.000
Licence Fees p.a.	... ...	2.840
Normal Seating Capacity	... ...	50 passengers
Depreciation Rate	... ...	20% p.a.

The bus usually runs full upto 90% of its capacity both ways. Permit fee is payable on the cost of bus at 10% p.a.

(M.Com. April 05)

Ans: (Total Operating Cost: Rs. 3,08,295, Total passenger Km.: 45,90,000)

Illustration 6 :

KKK Automobiles distributes its goods to a regional trader using a single lorry. The trader's premises are 40 kms away by road. The lorry has a capacity of 10 tonnes and makes the journey twice a day fully loaded on the outward journeys and empty on return journeys.

Your are given data for 4 weekly periods during the year 2003.

Petrol consumption 8 kms per litre

Petrol cost	Rs. 13 per litre
Oil	Rs. 100 per week
Driver's wages	Rs. 400 per week
Repairs	Rs. 100 per week
Garage rent	Rs. 150 per week
Cost of lorry	Rs. 4,50,000 (excluding tyres)
Life of lorry	80,000 kms.
Insurance	Rs. 6,500 p.a.
Cost of tyres	Rs. 6,250
Life of tyres	2,500 kms

Estimated Scrap value of lorry at the end of its life ₹50,000 Vehicle licence cost Rs. 1,300 p.a.

Other overhead cost Rs. 41,600 p.a.

The lorry operates on a Five-day week

Required :

a) A statement to show the total cost of operating the vehicle for the 4 weekly periods analysed into running costs and fixed costs.

b) Calculate vehicle cost per km. and per tonne km.

(M. Com, Oct. 04, adapted)

Ans: (Total Operating Cost: Rs. 28,800, Effective Km- Tonne .:16,000 Effective Km. 1600)

Illustration 7 :

A person owns a bus which runs between Delhi and Chandigarh and back for 10 days in a month. The distance between Delhi and Chandigarh is 150 kms. The bus completes the trip from Delhi and Chandigarh and back on the same day.

The bus goes to Agra for another 10 days. The distance between Delhi and Agra is 120 kms. The trip is also completed on the same day. For the rest 4 days of its operation, it runs in Delhi. The daily distance covered is 40 kms.

Calculate the charges to be made if a profit of 33(1/3)% is to be earned on his takings.

The other available information given to you is :

Cost of the bus Rs. 60,000.

Depreciation 20% p.a.

Salary of Driver Rs. 350 p.m.

Salary of Conductor Rs. 350 p.m.

Salary of Cleaner Rs. 160 p.m.

Insurance Rs. 1,680 p.a.

Diesel consumption is 4 kms per litre. Diesel costs Rs. one per litre. The token tax is Rs. 600 p.a.

Lubricants Rs. 10 per 100 kms; repairs and maintenance Rs. 300 p.m.; permit fee Rs. 284 p.m. and the normal capacity is 50 persons.

The bus generally has 90% of its capacity occupied when it goes to Chandigarh, 80% when it goes to Agra. It is always full when it runs within the city. Passenger tax is 20% of his net takings.

(M. Com, Oct. 04, adapted)

Ans: (Total Operating Cost per month: Rs. 4,580, Cost per passenger Km. Rs.0.034)

Illustration 8 :

A person owns a bus that runs between Mumbai and Lonavala and back, for 10 days in a month. The distance from Mumbai to Lonavala is 150 kms. The bus completes the trip from Mumbai to Lonavala and return in the same day. The bus goes another 10 days in a month towards Alibagh. The distance from Mumbai to Alibagh is 120 kms. The trip is also completed on the same day. For the rest 4 days of its operation in a month it runs locally in Mumbai, covering daily distance of 40 kms. Calculate the rate that the person should charge from passenger when he wants to earn the profit of 25% on his takings and also calculate the charge per passenger for both the out-station trips. The other information is given as follows :

Cost of the bus (Depreciation @ 20% p.a.; Normal Capacity : 50 persons) 6,00,000

Salary : Driver	5,000 per month
Salary : Conductor	5,000 per month
Fixed Office Overheads	2,000 per month
Insurance	7,200 per month
Fuel (Consumed @ 4 kms/litre)	35 per litre
R.T.O. tax	600 per annum
Lubricant Oil	10 per 100 kms
Repairs and Maintenance	500 per month
Permit Fee	300 per month

Passenger tax is 20% of the net takings. The bus is occupied 90% of its capacity while on Lonavala trip and 80% of its capacity while on Alibagh trip, but is fully occupied in its local journey.

(M. Com, April 08, adapted)

Ans: (Total Operating Cost: Rs. 72,656, Total Passenger Km. 2,39.000, Cost per passenger Km.: Rs.48.64)

Illustration 9

A transport company supplies the following details in respect of a truck of 5 tonne capacity which carries goods to an from the city covering a distance of 50 kms each way.

	Rs.
Cost of truck	1, 80,000
Diesel, oil, grease (per trip each way)	30
Repairs and maintenance (per month)	1,500
Driver's (monthly) wages	1,500
Cleaner-cum-attendant's wages (monthly)	750
Insurance (per year)	9,000
Road license (per year)	3,000
General Supervision charges (per year)	6,000
Estimated life (years)	10

While going to the city, freight is available for a full load of the truck and on its return journey it can fetch freight only upto 20 percent of its capacity.

On the assumption that the trucks runs on an average 25 days a month, you are required to determine the following :

i) Operating cost per tone-km,

ii) Rate per tone per trip that the company should charge if profit if 50 percent on cost is to be earned, and

iii) What freight should the company charge if one wants to engage the truck for one day for a trip to the city and back?

(M.Com , April 09, adapted)

Ans: (Total Operating Cost: Rs. 8,250, Cost per Tonne Km.: Rs.1.100)

Illustration 10 :

From the following information relating to a Hotel, calculate the room rent to be charged to give a profit of 25% on cost excluding interest charged on Loan for the year ended 31st March, 2008 :

1) Salaries of office staff Rs. 50,000 per month.

2) Wages of the room attendant: Rs. 20 per day per room when the room is occupied.

3) lighting, Heating and Power :

   a) The normal lighting expenses for a room for the full month is Rs. 500, when occupied.

   b) Power is used only in winter and the charges are 200 for a room, when occupied.

4) Repairs to Beds and other furniture: Rs. 30,000 per annum.

5) Repairs to Hotel building: Rs. 50,000 per annum.

6) Licence fees: Rs. 12,400 per annum.

7) Sundries: ₹ 10,000 per month.

8) Interior decoration and furnishing: Rs. 1,00,000 per annum.

9) Depreciation @ 5% p.a. is to be charged on Building costing 20,00,000/- and @ 10% p.a. on Equipments.

10) There are 200 rooms in the Hotel, 80% of the rooms are generally occupied in summer, 60% in winter and 30% in rainy season.

The period of summer, winter and rainy season may be considered to be of 4 months in each case. A month may be assumed of 30 days of an average

(M. Com. Oct. 08, adapted)

Ans: (Total Earnings: Rs. 33,18,000, Total Room Days: 40,800.Cost per Day: Rs.81 .32)

Illustration 11:

Relax Hotel has a capacity of 100 single rooms and 20 double rooms. The average occupancy of both single and double rooms is expected to be 80% throughout the year of 365 days. The rent for the double room has been fixed at 125% of the rent of the single room. The costs are as under:

Variable Costs	:	Single rooms Rs. 220 each per day
		Double rooms Rs. 350 each per day
Fixed Costs	:	Single rooms Rs. 120 each per day
		Double rooms Rs. 250 each per day

Calculate the rent chargeable for single and double rooms per day in such a way that the hotel earns on overall profit of 20% on hire charges of rooms.

(M. Com. April 09, adapted)

Ans: (Total Earnings: Rs. 1,67,90,000, Total Room Days: Single room: 29,200 Double room : 5,840.)

Illustration 12:

A hospital is run by a Company. For this purpose it has hired a building at a rent of Rs. 5,000 per month plus it would bear the repair charges also.

The hospital is having 25 beds and 5 more beds can be accommodated when the need arises.

The staff of the hospital is as follows :

2 Supervisors each at a salary of Rs. 500 per month

4 Nurses each at a salary of Rs. 300 per month

2 Ward boys, each at a salary of Rs. 150 per month

Although the hospital is open for patients all the 365 days in a year, records for the year 2004 disclose that only for 120 days in the year, the unit had the full capacity of 25 patients per day and when the beds were full, extra beds were hired at a charge of ₹ 5 per bed per day and this did not come to more than 5 beds extra above the normal capacity on any one day. The total hire charges for the extra beds incurred for the whole year were Rs. 2,000.

The Unit engaged expert doctors from outside to attend on the patients and the fees was paid on the basis of the number of patients attended and time spent by them which on an average worked out to Rs. 10,000 per month in 2004.

The other expenses for the year were as under:

Repair and Maintenance	Rs. 3,600
Food supplied to patients	Rs. 44,000
Sanitary and Other services for patients	Rs. 12,500
Laundry Charges	Rs. 28,000
Medicines supplied	Rs. 35,000

Cost of oxygen, X-ray, etc. other than directly borne for treatment of patients Rs. 54,000.

General Administration Charges allocated to hospital Rs. 49,550.

If the hospital recovered an amount of Rs. 100 per day on an average from each patient, compute the profit per patient – day made by the hospital as per operating cost sheet for the year 2004.

(M. Com. Oct.06, adapted)

Ans: (Total Earnings: Rs.61 ,350, Total Number of Patient days: 5000.)

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6

PROCESS COSTING

Unit Structure

6.0 LEARNING OBJECTIVES

After studying this chapter you should able to understand

- the meaning of Process Costing and its importance
- the distinction between job costing and process costing
- the accounting procedure of process costing including normalloss abnormal loss (or) gain
- the valuation of work-in-progress, using FIFO, LIFO averageand weighted average methods
- the steps involved in inter process transfer

6.1 INTRODUCTION

Process costing is a form of operations costing which is used where standardized homogeneous goods are produced. This costing method is used in industries like chemicals, textiles, steel, rubber, sugar, shoes, petrol etc. Process costing is also used in the assembly type of industries also. It is assumed in process costing that the average cost presents the cost per unit. Cost of production during a particular period is divided by the number of units produced during that period to arrive at the cost per unit.

6.2 MEANING OF PROCESS COSTING

Process costing is a method of costing under which all costs are accumulated for each stage of production or process, and the cost per unit of product is ascertained at each stage of production by dividing the cost of each process by the normal output of that process.

6.2.1 Definition:

CIMA London defines process costing as "that form of operation costing which applies where standardize goods are produced"

6.2.2 Features of Process Costing:

(a) The production is continuous

(b) The product is homogeneous

(c) The process is standardized

(d) Output of one process become raw material of another process

(e) The output of the last process is transferred to finished stock

(f) Costs are collected process-wise

(g) Both direct and indirect costs are accumulated in each process

(h) If there is a stock of semi-finished goods, it is expressed interms of equivalent units

(i) The total cost of each process is divided by the normal output ofthat process to find out cost per unit of that process.

6.2.3 Advantages of process costing:

1. Costs are be computed periodically at the end of a particularperiod
2. It is simple and involves less clerical work that job costing
3. It is easy to allocate the expenses to processes in order to have accurate costs.
4. Use of standard costing systems in very effective in process costing situations.
5. Process costing helps in preparation of tender, quotations
6. Since cost data is available for each process, operation and department, good managerial control is possible.

6.2.4 Limitations:

1. Cost obtained at each process is only historical cost and are notvery useful for effective control.
2. Process costing is based on average cost method, which is not that suitable for performance analysis, evaluation and managerial control.
3. Work-in-progress is generally done on estimated basis which leads to inaccuracy in total cost calculations.
4. The computation of average cost is more difficult in those cases where

more than one type of products is manufactured and a division of the cost element is necessary.

5. Where different products arise in the same process and common costs are prorated to various costs units. Such individual products costs may be taken as only approximation and hence not reliable.

6.3 DISTINCTION BETWEEN JOB COSTING AND PROCESS COSTING

Job order costing and process costing are two different systems. Both the systems are used for cost calculation and attachment of cost to each unit completed, but both the systemsare suitable in different situations. The basic difference between jobcosting and process costing are

	Basis of Distinction	**Job order costing**	**Process costing**
1.	Specific order	Performed against specific orders	Production iscontentious
2.	Nature	Each job many be different.	Product is Homogeneous andstandardized.
3.	Cost determination	Cost is determined for each job separately.	Costs are compiled for each process for department on timebasis i.e. for a given accounting period.
4.	Cost calculations	Cost is compiled whena job is completed.	Cost is calculated at the end of the cost period.
5.	Control	Proper control is comparatively difficult as each product unit is different and the production is not continuous.	Proper control is comparatively easier as the production is standardized and is more suitable.
6.	Transfer	There is usually not transfer from one job to another unless there is some surplus work.	The output of oneprocess is transferred to another process as input.
7.	Work-in-Progress	There may or may notbe work-in-progress.	There is always some work-in-progress because of continuous production.
8.	Suitability	Suitable to industries where production is intermittentand customer orders can be identified in thevalue of production.	Suitable, where goods are made for stock and productionsiscontinuous.

6.4 COSTING PROCEDURE

For each process an individual process account is prepared.

Each process of production is treated as a distinct cost center.

6.4.1 Items on the Debit side of Process A/c.

Each process account is debited with –

a) Cost of materials used in that process.

b) Cost of labour incurred in that process.

c) Direct expenses incurred in that process.

d) Overheads charged to that process on some pre-determined.

e) Cost of ratification of normal defectives.

f) Cost of abnormal gain (if any arises in that process)

6.4.2 Items on the Credit side:

Each process account is credited with

a) Scrap value of Normal Loss (if any) occurs in that process.

b) Cost of Abnormal Loss (if any occurs in that process)

6.4.3 Cost of Process:

The cost of the output of the process (Total Cost less Sales valueof scrap) is transferred to the next process. The cost of each process is thus made up to cost brought forward from the previous process and net cost of material, labour and overhead added in thatprocess after reducing the sales value of scrap. The net cost of the finished process is transferred to the finished goods account. The net cost is divided by the number of units produced to determinethe average cost per unit in that process. Specimen of Process Account when there are normal loss and abnormal losses.

Dr. Process I A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Basic Material	Xxx	xx	By Normal Loss	xx	xx
To Direct Material		xx	By Abnormal Loss	xx	xx
To Direct Wages		xx	By Process II A/c.	xx	xx
To Direct Expenses		xx	(output transferred to		
To Production Overheads		xx	Next process)		
To Cost of Rectification of Normal Defects		xx	By Process I Stock A/c.	xx	xx
To Abnormal Gains		xx			
	Xx	**xxx**		**xx**	**xx**

6.4.4 Process Losses:

In many process, some loss is inevitable. Certain production techniques are of such a nature that some loss is inherent to the production. Wastages of material, evaporation of material is unavoidable in some process. But sometimes the Losses are also occurring due to negligence of Labourer, poor quality raw material, poor technology etc. These are normally called as avoidable losses. Basically process losses are classified into two categories

(a) Normal Loss (b) Abnormal Loss

1. Normal Loss:

Normal loss is an unavoidable loss which occurs due to the inherent nature of the materials and production process under normal conditions. It is normally estimated on the basis of past experience of the industry. It may be in the form of normal wastage,normal scrap, normal spoilage, and normal defectiveness. It may occur at any time of the process.

No of units of normal loss: Input x Expected percentage of Normal Loss.

The cost of normal loss is a process. If the normal loss units can be sold as a crap then the sale value is credited with process account. If some rectification is required before the sale of the normal loss, then debit that cost in the process account. Afteradjusting the normal loss the cost per unit is calculates with the help of the following formula:

Cost of good unit:

Total cost increased – Sale Value of ScrapInput – Normal Loss units

2. Abnormal Loss:

Any loss caused by unexpected abnormal conditions suchas plant breakdown, substandard material, carelessness, accident etc. such losses are in excess of pre-determined normal losses. This loss is basically avoidable. Thus abnormal losses arrive when actual losses are more than expected losses. The units of abnormal losses in calculated as under:

Abnormal Losses = Actual Loss – Normal Loss

The value of abnormal loss is done with the help of following formula:

Value of Abnormal Loss:

Total Cost increase – Scrap Value of normal Loss x Units of abnormal lossInput units – Normal Loss Units

Abnormal Process loss should not be allowed to affect the cost of production as it is caused by abnormal (or) unexpected conditions.

Such loss representing the cost of materials, labour and overhead charges called abnormal loss account. The sales value ofthe abnormal loss is credited to Abnormal Loss Account and the balance is written off to costing P & L A/c.

Dr. Abnormal Loss A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process A/c.	xx	xx	By Bank	xx	xx
			By Costing P & L A/c.	xx	xx
	xx	**xxx**		**xx**	**xx**

3. Abnormal Gains:

The margin allowed for normal loss is an estimate (i.e. onthe basis of expectation in process industries in normal conditions) and slight differences are bound to occur between the actual outputof a process and that anticipates. This difference may be positive ornegative. If it is negative it is called ad abnormal Loss and if it is positive it is Abnormal gain i.e. if the actual loss is less than the normal loss then it is called as abnormal gain. The value of the abnormal gain calculated in the similar manner of abnormal loss. The formula used for abnormal gain is:

Abnormal Gain

Total Cost incurred – Scrap Value of Normal Loss x Abnormal Gain UnitesInput units – Normal Loss Units

The sales values of abnormal gain units are transferred to Normal Loss Account since it arrive out of the savings of Normal Loss. The difference is transferred to Costing P & L A/c. as a Real Gain.

Dr. Abnormal Gain A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Normal LossA/c.	xx	xx	By Process A/c.	xx	xx
To Costing P & LA/c.	xx	xx			
	xx	**xxx**		**xx**	**xx**

Check Your Progress:

1. Define the following terms
   a. Process costing
   b. Normal Loss
   c. Abnormal Loss
2. Give the formulas of following
   a) Cost of good / normal unit
   b) Value of Abnormal Loss

6.5 SOLVED ILLUSTRATIONS

Illustration 1: (Normal / Abnormal Loss)

Prepare a Process Account, Abnormal Loss Account andNormal Loss Account from the following information.

Input of Raw material	1000 units @ Rs. 20 perunit Rs. 4,200/- Rs.
Direct Material	6,000/- Rs. 6,000/-
Direct Wages	900 units 5%
Production Overheads	Rs. 8/-
Actual output transferred to process	

Solution :

Dr. Process – I A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Raw material@ 20	1000	20000	By Normal Loss		
To Direct Material		4200	(5% on 1000)	50	400
To Direct Wages		6000	By Abnormal Loss A/c.	50	
To Production			BY Process – II A/c.		
Overheads		6000	(output transferred)	900	
	1000	36200		1000	36200

Dr. Abnormal Loss A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process – I A/c.	50		By Bank A/c.	50	400
			By Costing P & L A/c.		
	50			50	400

Dr. Normal Loss A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process – I A/c.	50	400	BY Bank	50	400

Working Notes:

(1) Cost of abnormal Loss :

$$= \frac{\text{Total Cost increased – Sales value of Scrap}}{\text{Input units – Normal Loss Units}} \times \text{abnormal units}$$

$$= \frac{36200 - 400}{1000 - 50} \times 50$$

(2) It has been assumed that units of abnormal loss have alsobeen sold at the same rate i.e. of Normal Scrap

Illustration 2: (Normal / Abnormal Loss and Abnormal Gain)

The product of a company passes through 3 distinct process. The following information is obtained from the accounts forthe month ending January 31, 2008.

Particulars	Process – A	Process – B	Process – C
Direct Material	7800	5940	8886
Direct Wages	6000	9000	12000
Production Overheads	6000	9000	12000

3000 units @ Rs. 3 each were introduced to process – I. There wasno stock of materials or work in progress. The output of eachprocess passes directly to the next process and finally to finished stock A/c.

The following additional data is obtained :

Process	Output	Percentage of Normal Loss toInput	Value of Scrap perunit (Rs.)
Process – I	2850	5 %	2
Process – II	2520	10 %	4
Process – III	2250	15 %	5

Prepare Process Cost Account, Normal Cost Account andAbnormal Gain or Loss Account.

Solution:

Dr. Process – A A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Units introduced	3000	9000	By Normal Loss A/c.	150	300
To Direct Material		7800	By Process – B A/c.	2850	28500
To Direct Wages		6000	(Units transferred		
To Production			@ Rs. 10/-)		
Overheads		6000			
	3000	**28800**		**3000**	**28800**

Dr. Process – B A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process – IA/c.	2850	28500	By Normal Loss A/c.	285	1140
To Direct Material		5940	By Abnormal Loss A/c.	45	9000
To Direct Wages		9000	By Process – C A/c.	2520	50400
To Production					
Overheads		9000			
	2850	**52440**		**2850**	**52440**

Dr. Process – C A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process – II A/c.	2520	50400	By Normal Loss A/c.	378	1890
To Direct Material A/c		8886	By Finished Stock A/c.	2250	85500
To Direct Wages		12000			
To Production					
Overheads		12000			
To Abnormal Gain A/c.	108	4104			
	2628	**87390**		**2628**	**87390**

Dr. Abnormal Gain A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Normal Loss A/c.	108	540	By Process – C A/c.	108	4104
To Costing P&L A/c.		3564			
	108	**4104**		**108**	**4104**

Dr. Normal Loss A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process – A A/c.	150	300	By Bank A/c. (Sales)		
To Process – B A/c.	285	1140	Process – AA/c.	150	300
To Process – C A/c.	378	1890	Process – B A/c.	285	1140
			Process – CA/c.	270	1350
			By Abnormal Gain A/c.	108	540
	813	**3330**		**813**	**3330**

6.6 INTER PROCESS PROFITS

Normally the output of one process is transferred to another process at cost but sometimes at a price showing a profit to the transfer process. The transfer price may be made at a price corresponding to current wholesale market price or at cost plus an agreed percentage. The advantage of the method is to find out

Whether the particular process is making profit (or) loss. This will help the management whether to process the product or to buy the product from the market. If the transfer price is higher than the cost price then the process account will show a profit. The complexity brought into the accounting arises from the fact that the interprocess profits introduced remain a part of the prices of process stocks, finished stocks and work-in-progress. The balance cannot show the stock with profit. To avoid the complication a provision must be created to reduce the stock at actual cost prices. This problem arises only in respect of stock on hand at the end of the period because goods sold must have realized the internal profits. The unrealized profit in the closing stock is eliminated by creating a stock reserve. The amount of stock reserve is calculated by the following formula.

$$\text{Stock Reserve} = \text{Transfer Value of stock} \times \frac{\text{Profit included in transfer price}}{\text{Transfer Price}}$$

Illustration 3 :

A product passes through three processes before its completion. The output of each process s charged to the nextprocess at a price calculated to give a profit of 20% on transfer price. The output of Process III is transferred to finished stockaccount on a similar basis. There was no work-in-progress at the beginning of the years. Stock in each process has been valued at prime cost of the process. The following data is available at the endof 31st March, 2009.

	ProcessI	**Process II**	**Process III**	**Finished Stock Rs.**
Direct Material	20000	30000	10000	--
Direct Wages	30000	20000	40000	--
Stock on 31st March 2009	10000	20000	30000	15000
Sale during the year	--	--	--	180000

From above information prepare:

1. Process Cost Account showing the profit at each stage.
2. Actual realized profit and
3. Stock Valuation as would appear in the balance sheet

Solution:

Dr. Process – I A/c. Cr.

Particulars	**Total Rs.**	**Cost Rs.**	**Profit Rs.**	**Particulars**	**Total Rs.**	**Cost Rs.**	**Profit Rs.**
To Materials	20000	20000	--	By Process II A/c. (Transfer)	50000	40000	10000

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
To Wages	30000	30000	--				
Total	50000	50000	--				
Les Closing							
Stock c/d	10000	10000	--				
Prime Cost	40000	40000	--				
To Gross							
Profit	10000	--	10000				
(20% on							
TransferPrice)							
	50000	40000	10000		50000	40000	10000
To Stock B/d.	10000	10000	--				

Dr. Process – II A/c. Cr.

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
To Process – I A/c.	50000	40000	10000	By Process-III			
				A/c.	100000	72000	28000
To Material	30000	30000	--	(Transfer)			
To Wages	20000	20000	--				
	100000	90000	10000				
Less : Closing							
Stock C/d.	20000	18000	2000				
Prime Cost	80000	72000	8000				
To Gross Profit							
(20% on							
Transfer Price)	20000	--	20000				
	100000	72000	28000		100000	72000	28000
To Stock B/d.	20000	18000	2000				

Process III A/c

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
ToprocessII	100000	72000	28000	By Finished	150000	97600	52400
A/c				stock A/c			
To Material	10000	10000	_____				
To Wages	40000	40000	-------				
TOTAL	150000	122000	28000				
Less.Closing stock	30000	24400	5600				
To Gross profit	120000	97600	22400				
(20%of transfer price)	30000	--------	30000				
	150000	97600	52400		150000	97600	52400
To Stock b/d	30000	24000	5600				

Finished stock A/c

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
To process	115000	97600	52400	By Sales	180000	87840	92160
III A/c							
(-)Stock	15000	9760	5240				
To gross profit	135000	87840	92160				
	45000	---	45000				
	180000	87840	92160		180000	87840	92160
To Stock A/c	15000	9760	5240				

Calculation of profit on closing stock

Profit included in stock = Profit included in transfer price x Value of stock
Transfer price

Process I = No profit

Process II = 10000 x 20000=2000
100000

Process III =28000x30000=5600
150000

Finished stock= 52400x15000=5240
150000

Illustration 4 :

A product process through three process A, B and C. The details of expenses incurred on the three process during the year 2008 were as under :

	Process A	**Process B**	**Process C**
Units introduced	10000		
Cost per unit is Rs. 50/-			
	Rs.	Rs.	Rs.
Sundry Material	6000	9000	3233
Labour	18000	48000	39000
Direct Expenses	3000	11000	18000
Selling price per unit of output	70	100	200

Management expenses during the year were Rs. 80000 and selling were Rs. 5000. There are not allocable to the processes. Actual output of the three process were A – 9300 units, B – 5400 units and C 2100 units. Two-thirds of the output of process A and one half of the output of process B was passed on to the next process A and one-half of the output of process B was passed onto the next process and the balance was sold. The entire output of process C was sold.

The normal losses of the three process, calculated on the input of every process was : Process A – 5%, B – 15% and C – 20%. The loss of process A was sold @ Rs. 3 per unit, that of B @ Rs. 5 per unit and of process C @ Rs. 10 per unit.

Prepare process A, B and C account and the Profit and LossAccount.

Solution :

Dr. Process A A/c. Cr.

Particulars	**Units**	**Rs.**	**Particulars**	**Units**	**Rs.**
ToUnits Introduced @RS.50	10000	5,00,000	By Normal Loss	500	1,500
			By Abnormal loss	200	11063
ToSundry Materials		6,000	By process B	6,200	342958
To Labour		18,000	By output sold	3,100	171479
ToDirect Expenses		3,000			
	10000	5,27,000		10000	5,27,000

Dr. **Process B A/c.** **Cr.**

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process A A/c.	6200	342958	By Normal Loss	930	4650
ToSundry Materials		9000	By Process C A/c.	2700	2,08,165
To Labour		48000	By output sold	2700	2,08,165
To Direct Expenses		11000			
ToAbnormal Gains		100221			
A/c. (@ 77.19)					
	6330	**420980**		**6,330**	**4,20,980**

Dr. **Process C A/c.** **Cr.**

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process B A/c.	2700	208165	By Normal Loss	540	5400
ToSundry Materials		3233	By Abnormal Loss	60	7305
To Labour		39000	By output sold	2100	255693
To Direct Expenses		18000	(@ 12.76)		
	2700	**268398**		**2700**	**268398**

Dr. **Profit & Loss A/c.** **Cr.**

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process A A/c.	3100	171479	By Sales(@ Rs. 70)	3100	217000
To Process B A/c.	2700	208165	By Sales(@Rs. 100)	2700	270000
To Process C A/c.	2700	265693	BySales(@Rs.2000)	2700	420000
To Management Expenses A/c.		80000	BY Abnormal Gain A/c.		9372
To Selling Expenses		50000			
To Abnormal Loss A/c.		17168			
To Net Profit		133867			
		916372			**916372**

Dr. Abnormal Loss A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process A A/c.	200	11063	By Bank Sales		
To Process B A/c.	60	7305	(@ Rs. 30)	200	600
			By Bank		
			(@ Rs. 10)	60	600
			By P & L A/c.		17168
	260	**18368**		**260**	**18368**

Dr. Abnormal Gain A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Normal Loss A/c.	130	650	By Process B /c.	130	10022
To Costing P & L A/c.		9372			
	130	**10022**		**130**	**10022**

Illustration 5

Mahesh Ltd process a material which passes through three processes. Figures relating to production for the first 6 months of 2009 are as follows.

	Process A	Process B	Process C
Raw material used	1000 tones @ Rs. 200		
Manufacturing Wages	Rs. 40000	Rs. 30000	Rs. 7000
Expenses	Rs. 32500	Rs. 10800	Rs. 3710
Scrap sold @ Rs. 50 per tone	50 tones	30 tones	51 tones
Selling price per tone	Rs. 320	Rs. 450	Rs. 800
Weight Loss	5%	10%	20%

Management expenses were Rs. 10500, selling expenses Rs. 8000 and interest on borrowed capital Rs. 2000. Two third of process I and one half of process 2 are passed on to the next process and the balance are sold.

Prepare Process Account, Process Stock Account and Costing Profit & Loss A/c.

Solution

Dr. Process No. 1 A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Material @ Rs. 200	1000	200000	By Normal Loss (sale of Scrap)	50	2500
To Wages		40000	By Weight Loss	50	--
To Expenses		32500	By Process I Stock A/c.(@300per tone)	900	270000
	1000	**272500**		**1000**	**272500**

Dr. Process No. 1 Stock A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process I A/c.	900	270000	By Bank (@ 320)	300	96000
To Costing Profit & Loss A/c.		6000	ByProcessNo.2 A/c.	600	180000
	900	**276000**		**900**	**276000**

Dr. Process No. 2 A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process 1 Stock A/c.	600	180000	By Normal Loss (@ Rs. 50)	30	1500
To wages		30000			
To Expenses		10800	By Weight Loss	60	--
			By Process 2 Stock		
			A/c(@ Rs. 430)	510	219300
	600	**220800**		**600**	**220800**

Dr. Process No. 2 Stock A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process 2 A/c.	510	219300	By Bank		
To Costing P&L A/c.		5100	(sale @ 450)	255	114750
			By Process 3 A/c.	255	109650
	510	**244400**		**510**	**244400**

Dr. Process No. 3 A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process 2 Stock A/c.	255	109650	By scrap	51	2550
To wages		7000	By Weight Loss	51	--
To Expenses		3710	By Process 3 stock A/c	153	117810
	255	**120360**		**255**	**120360**

Dr. Process No. 3 Stock A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process 3 A/c.	153	117810	By Bank		
To Costing P & L A/c.		4590	(sale @ 800)	153	122400
	153	**122400**		**153**	**122400**

Dr. Costing Profit & Loss A/c. Cr.

Particulars	Rs.	Particulars	Rs.
To Management Expenses	10500	By Process 1 Stock A/c.	6000
To Selling Expenses	8000	By Process 2 Stock A/c.	5100
To Interest on Capital	2000	By Process 3 Stock A/c.	4590
		By Net Loss	4810
	20500		**20500**

6.7 VALUATION OF WORK-IN-PROGRESS

6.7.1 Meaning of Work-in-Progress:

Since production is a continuous activity, there may be someincomplete production at the end of an accounting period.Incomplete units mean those units on which percentage of completion with regular to all elements of cost (i.e. material, labour and overhead) is not 100%. Such incomplete production units are known as Work-in-Progress. Such Work-in-Progress is valued in terms of equivalent or effective production units.

6.7.2 Meaning of equivalent production units :

This represents the production of a process in terms of complete units. In other words, it means converting the incomplete production into its equivalent of complete units. The term equivalentunit means a notional quantity of completed units substituted for an actual quantity of incomplete physical units in progress, when the aggregate work content of the incomplete units is deemed to be equivalent to that of the substituted quantity. The principle applies when operation costs are apportioned between work in progress and completed units.

Equivalent units of work in progress = Actual no. of units in progress x Percentage of work completed

Equivalent unit should be calculated separately for each element of cost (viz. material, labour and overheads) because the percentage of completion of the different cost component may be different.

6.7.3 Accounting Procedure:

The following procedure is followed when there is Work-in-

Progress

6.7.3.1 Find out equivalent production after taking into account of the process losses, degree of completion of opening and / orclosing stock.

6.7.3.2 Find out net process cost according to elements of costs i.e. material, labour and overheads.

6.7.3.3 Ascertain cost per unit of equivalent production of each element of cost separately by dividing each element of costs by respective equivalent production units.

6.7.3.4 Evaluate the cost of output finished and transferred work in progress

The total cost per unit of equivalent units will be equal to thetotal cost divided by effective units and cost of work-in-progress will be equal to the equivalent units of work-in-progress multiply by the cost per unit of effective production. In short the following from steps an involved.

Step 1 – prepare statement of Equivalent production

Step 2 – Prepare statement of cost per Equivalent unit

Step 3 – Prepare of Evaluation

Step 4 – Prepare process account

The problem on equivalent production may be divided into fourgroups.

6.7.3.4.1 when there is only closing work-in-progress but withoutprocess losses

6.7.3.4.2 when there is only closing work-in-progress but withprocess losses

6.7.3.4.3 when there is only opening as well as closing work-in-progress without process losses

6.7.3.4.4 when there is opening as well as closing work-in-progress with process losses

Situation I :

Only closing work-in-progress without process losses :

In this case, the existence of process loss is ignored. Closing work-in-progress is converted into equivalent units on the basis of estimates on degree of completion of materials, labour and production overhead. Afterwards, the cost pr equivalent unit is calculated and the same is used to value the finished output transferred and the closing work-in-progress

Situation II:

When there is closing work-in-progress with process loss orgain.

If there are process losses the treatment is same as already discussed in this chapter. In case of normal loss nothing should be added to equivalent production. If abnormal loss is there, it should be considered as good units completed during the period. If units scrapped (normal loss) have any reliable value, the amount should be deducted from the cost of materials in the cost statement before dividing by equivalent production units. Abnormal gain will be deducted to obtain equivalent production.

Situation III:

Opening and closing work-in-progress without processlosses.

Since the production is a continuous activity there is possibility of opening

as well as closing work-in-progress. The procedure of conversion of opening work-in-progress will vary depending on the method of apportionment of cost followed viz, FIFO, Average cost Method and LIFO.

Let us discuss the methods of valuation of work-in-progress one byone.

(a) **FIFO Method:** The FIFO method of costing is based on the assumption of that the opening work-in-progress units arethe first to be completed. Equivalent production of opening work-in-progress can be calculated as follows:

Equivalent Production = Units of Opening WIP x Percentage of work needed to finish the units

(b) **Average Cost Method:** This method is useful when price fluctuate from period to period. The closing valuation of work-in-progress in the old period is added to the cost of new period and an average rate obtained. In calculating the equivalent production opening units will not be shown separately as units of work-in-progress but included in the units completed and transferred.

(c) **Weighted Average Cost Method:** In this method no distinction is made between completed units from opening inventory and completed units from new production. All units finished during the current accounting period are treated as if they were started and finished during that period. The weighted average cost per unit is determined by dividing the total cost (opening work-in-progress cost + current cost) by equivalent production.

(d) **LIFO Method:** In LIFO method the assumption is that the units entering into the process is the last one first to be completed. The cost of opening work-in-progress is charged to the closing work-in-progress and thus the closing work-in- progress appears cost of opening work-in-progress. The completed units are at their current cost.

(1) Format of statement of Equivalent Production :

Input		**Output**		**Equivalent Production**					
Particulars	**Units**	**Particulars**	**Units**	**Material**		**Labour**		**Overheads**	
				%	**Units**	**%**	**Units**	**%**	**Units**
Opening Stock	xx	Units completed	xx	xx	xx	xx	xx		
Units Introduced	xx	Normal Loss	xx	--	--	--	--		
		Abnormal Loss	xx	xx	xx	xx	xx		
	xx	Equivalent Units	xx	xx	xx	xx	xx	xx	Xx

(2) Statement of cost per Equivalent Units :

Element of costing	**Cost Rs.**	**Equivalent Units**	**Cost per EquivalentUnits Rs**
Material Cost (Net)	Xx	Xx	Xx
Labour Cost	Xx	Xx	Xx
Overheads Cost	Xx	xx	Xx
	xx		Xx

(3) Statement of Evaluation

Particulars	**Element ofcost**	**Equivalent Units**	**Cost per equivalent units Rs.**	**Cost Rs.**	**Total Cost Rs.**
Units completed	Material	xx	xx	xx	
	Labour	xx	xx	xx	
	Overheads	xx	xx	xx	Xx
Closing WIP	Material	xx	xx	xx	
	Labour	xx	xx	xx	
	Overheads	xx	xx	xx	Xx
Abnormal Loss	Material	xx	xx	xx	
	Labour	xx	xx	xx	
	Overheads	xx	xx	xx	Xx

Illustration 6: (Average Costing)

Prepare a statement of equivalent production, statement of cost, process account from the following information using average costing method.

Opening Stock	50000 Units
Material	Rs. 25000
Labour	Rs. 10000
Overheads	Rs. 25000
Units Introduced	2000000 Units
Material	Rs. 100000
Wages	Rs. 75000
Overheads	Rs. 70000

During the period 1,50,000 units were completed and transferred to Process II.

Closing stock 1,00,000 units. Degree of completion.

Material 100 %

Labour 50 %

Overheads 40 %

Solution :

Input		Output		Equivalent Production					
Particulars	Units	Particulars	Units	Material		Labour		Overheads	
				%	Units	%	Units	%	Units
Opening		Units							
Stock	50,000	Produced	150000	100	150000	100	150000	100	150000
Introduced	200,000	Closing							
		Stock	100000	100	100000	50	50000	40	40000
	250000		250000		250000		200000		190000

Statement of Cost :

Element	Opening cost Rs.	Current cost Rs.	Total Cost Rs.	Equivalent units	Cost per unit
Material	25,000	1,00,000	1,25,000	2,50,000	0.500
Labour	10,000	75,000	85,000	2,00,000	0.425
Overheads	25,000	70,000	95,000	1,90,000	0.500
	60,000	2,45,000	3,05,000		1.425

Statement of Apportionment of Cost

Particulars	Units	Cost per unit	Cost	Totalcost
1. Units introduced & transferred	1,50,000	1.425		213750
2. Closing work-in-progress				
Material	1,00,000	0.500	50,000	
Labour	50,000	0.425	21,250	
Overheads	40,000	0.500	20,000	91,250
				3,05,000

Dr. Process I A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening Stock	50,000	60,000	By Units completed		
To Materials	2,00,000	1,00,000	& transfer	50,000	2,13,750
To Labour		75,000	By Closing Stock	50,000	91,250
To Overheads		70,000			
	2,50,000	3,05,000		2,50,000	3,05,000

Illustration 7: (FIFO Method)

From the following information relating to KKN Company Ltd.

Prepare Process Cost Account for Process III for the year 2008.

Opening Stock IN Process III units of	5000 Rs. 36,000
Transfer from Process II units of	2,13,000 Rs. 8,27,000
Direct Material added in Process III	Rs. 4,01,800
Direct Wages	Rs. 1,98,100
Production Overhead	Rs. 99,050
Units Scrap	11,000 units
Transferred to Process IV units	1,89,000
Closing Stock	18,000 units

Degree of Completion :		
Opening Stock	**Closing Stock**	**Scrap**
Material 70 %	80 %	100 %
Labour 50 %	60 %	80 %
Overhead 50 %	60 %	80 %

There was a normal loss of 5% production and unit scrapedwere sold at Rs. 1.50

Solution :

Input		**Output**		**Equivalent Production**					
Particulars	**Units**	**Particulars**	**Units**	**Material**		**Labour**		**Overheads**	
				%	**Units**	**%**	**Units**	**%**	**Units**
Opening		Normal							
Stock	5,000	Loss	10000						
Process II		Op. Stock							
Transfer	213,000	Processed	5000	-	-	30	1500	50	2500
		Introduces & Completed	184000	100	184000	100	184000	100	184000
		Abnormal							
		Loss	1000	100	1000	100	1000	80	800
		Closing							
		Stock	18000	100	18000	80	14400	60	10800
	218000		218000		203000		200900		198100

Note : Units Produced: Opening stock + units introduced – closing stock : 5000 +213000 – 18000 = 200000
Normal Loss : 5 % of 200000 = 10000 units

Statement of Cost

Particulars		CostRs.	Equivalent Units Rs.	Cost Per Unit Rs.
Material – I				
Transfer process From Previous	8,27,000			
Less – (normal) Value of scrap	15,000	8,12,000	2,03,000	4.00
Material – II				
Added+ in the process		4,01,800	2,00,900	2.00
Direct Wages		1,98,100	1,98,100	1.00
Overheads		99,050	1,98,100	0.50
				7.50

Statement of Apportionment of Cost

Particulars	Elements	Equivalent Units	Cost Per Unit Rs.	CostRs.	Total costRs.
Op. Stock Processed	Material I	--		--	
	Material II	1,500	2.00	3,000	
	Wages	2,500	1.00	2,500	
	Overheads	2,500	0.50	1,250	6,750
Units introduced and	Material I	1,84,000	4.00	7,36,000	
Completed	Material II	1,84,000	2.00	3,68,000	
	Wages	1,84,000	1.00	1,84,000	
	Overheads	1,84,000	0.50	92,000	13,80,000
Closing stock	Material I	18,000	4.00	72,000	13,86,750
	Material II	14,400	2.00	28,800	
	Wages	10,800	1.00	10,800	
	Overheads	10,800	0.50	5,400	1,17,000
Abnormal loss	Material I	1,000	4.00	4,000	
	Material II	1,000	2.00	2,000	
	Wages	800	1.00	800	
	Overheads	800	0.50	400	7,200
TOTAL					**15,10,950**

Dr. Process III A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Balance b/d.	5,000	36,000	By Normal Loss	10,000	15,000
To Process II A/c.	2,13,000	8,27,000	By Process IV A/c.	1,89,000	14,22,750
To Materials		4,01,800	By Abnormal Loss	1,000	7,200
To Wages		1,98,100	By Closing Stock	18,000	1,17,000
To Overheads		99,050			
	2,18,000	**15,61,950**		**2,18,000**	**15,61,950**

Note :	
Cost of goods transferred to Process IV :	
Value of Opening Stock	36,000
Cost incurred in this process for Opening Stock	6,750
Cost incurred for the units introduced & Processed	13,80,000
Total	**14,22,750**

Illustration 8

The following information is given in respect of Processcosting 10 : 3 for the month of January 2009.

Opening stock – 2,000 units made up of

	Rs.
Direct Material – I	12,350
Direct Material – II	13,200
Direct Labour	17,500
Overheads	11,000

Transferred from Process 2 – 20,000 units @ Rs. 6 per unit.Transferred to Process 4 – 17,000 units

Expenditure incurred in process – 3

	Rs.
Direct Material	30,000
Direct Labour	60,000
Overheads	60,000

Scrap:1,000 units-Direct Materials 100%,Direct Labour 60%,Overheads 40%.

Normal Loss 10 % of Production. Scrapped units realized Rs. 4/- per unit

Closing stock : 4,000 units – Degree of completion. DirectMaterials 80 %, Direct Labour 60 % and Overheads 40 %.

Prepare Process 3 Account using average price method along with necessary supporting statements.

[C. A. – Inter, May 2001]

Solution :

Statement of Equivalent Production (weighted Average costMaterial)

Particulars	Total Units	Material – I		Material – II		Labour		Overheads	
				%	Units	%	Units	%	Units
Units Completely									
Processed	17000	100	17000	100	17000	100	17000	100	17000
Normal Loss	1800	--							
10% of (2000 + 20000 – 4000)									
Abnormal Gain	800	100	800	100	800	100	800	100	800
Closing Stock	4000	100	4000	80	3200	60	2400	40	1600
	22000		20200		19400		18600		17800

Statement of Cost

Particulars	CostRs.	Equivalent Units	Rate / Equivalent Units Rs.
Material – I :			
Opening balance 2000 units	12,350		
Cost of 20000 units @ Rs. 6			
Per unit	1,20,000		
	1,25,150	20,200	6.1955
Material – II :			
Opening Stock	13,200		
In Process II	30,000		
	43,200	19,400	2.2268
Labour :			
Opening Labour	17,500		
In Process II	60,000		
	77,500	18,600	4.1667
Overheads :			
Opening Stocks	11,000		
In Process II	60,000		
	71,000	17,800	3.9888
Total cost per unit			**16.5778**

			Rs.
Finished goods	(17000 units x Rs. 16.5778)		2,81,822
Abnormal Units	(800 units x Rs. 16.5778)		13,262
Workinprogress		24,782	
Material I	(4000 units x Rs. 6.1955)	7,126	
Material II	(3200 units x Rs. 2.2268)	10,000	
Labour	(2400 units x Rs. 4.1667)	6,382	48,290
Overheads	(1600 units x Rs. 3.9888)		

Dr. Process III A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening WIP	2,000	57,050	By Normal Loss	1,800	7,200
To Process 2	20,000	1,20,000	By Finished Goods		
To Direct			Units	17,000	2,81,822
Material II		30,000	By Closing Balance	4,000	48,290
To Direct Labour		60,000			
To Overheads		60,000			
To Abnormal Gain	800	13,262			
	22,800	**3,37,312**		**22,800**	**3,37,312**

Illustration.9

The finished product of a factory pass through two processes.The entire material being placed in process at the beginning of the first process. From the following production andlast data relating to the first process, work out the value of the closing inventory and the value of the materials transferred to the second process.

Process I	**Rs.**
Opening inventory	10,000
Material	27,500
Labour	50,000
Manufacturing Overheads	40,000
Opening inventory (25 percent complete)	4,000
Put into Process	12,000
Transferred to II Process	10,000
Closing inventory (20 percent completed)	5,000
Spoilage during process	1,000

[I.C.W.A., Final]

Solution :

Process I A/c

Particulars	Kg.	Amount Rs.	Particulars	Kg.	Amount Rs.
Opening Inventory	4,000	10,000	Transferred to Process II	10,000	1,15,750
Material	12,000	27,500	Normal Loss	1,000	--
Labour		50,000	Closing Inventory	5,000	11,750
Manufacturing					
Overheads		40,000			
	16,000	**1,27,500**		**16,000**	**1,27,500**

Working Note :

Statement of Equivalent Production Units

Particulars	Output Kg.	Material		Labour		Overheads	
		Qty.	%	Qty.	%	Qty.	%
Opening Stock Processed	4,000	3,000	75	3,000	75	3,000	75
Completely Processed	6,000	6,000	100	6,000	100	6,000	100
Normal Loss	1,000	--	--	--	--	--	--
Closing Inventory	5,000	1,000	20	1,000	20	1,000	20
	16,000	**10,000**		**10,000**		**10,000**	

Statement of Element of Cost on the basis of EquivalentProduction

Particulars	Cost Rs.	Equivalent Units	Cost per Unit Rs.
Material	27,500	10,000	2.75
Labour	50,000	10,000	5.00
Overheads	40,000	10,000	4.00
Total			11.75

Statement of Apportionment of Cost

Particulars	Elements	Equivalent Units	Cost Per Unit Rs.	Cost Rs.	Totalcost Rs.
Op. Stock Processed	Material	3,000	2.75	8,250	
	Labour	3,000	5.00	15,000	
	Overheads	3,000	4.00	12,000	35,250
Completely Processed	Material	6,000	2.75	16,500	

Particulars	Elements	Equivalent Units	Cost Per Unit Rs.	Cost Rs.	Totalcost Rs.
	Labour	6,000	5.00	30,000	
	Overheads	6,000	4.00	24,000	70,500
Closing Inventory	Material	1,000	2.75	2,750	
	Labour	1,000	5.00	5,000	
	Overheads	1,000	4.00	4,000	11,750
TOTAL					**1,17,500**

Value of goods transferred to next process

	Rs.	Units
Value of opening stock (given)	10,000	
Additional cost on opening stock	35,250	4,000
Value of completely processed units	70,500	6,000
	1,15,750	10,000

Illustration 10

ABC Limited manufactures a product '2X' by using the process normally R. T. for the month of May 2009, the following data is available.

Process R. T.

Material Introduced 16,000 units

Transfer to next process 14,000 units

Work-in-Process 4,000 units

At the beginning of the month (4/5 completed) 3,000 unitsAt the end of the month (2/3 completed)

Cost records:

Work-n-Process at the beginning of the month

Material Rs. 30,000

Conversioncost Rs. 29,200

Cost during the month Materials Rs. 1,20,000

Conversion cost Rs. 1,60,800

Normal spoiled units are 10% of goods finished outputtransferred to next process.

Defects in these units are identified in their finished state.

Materials for the product is put in the process at the beginning ofthe cycle of operation, whereas labour and other indirect cost flow evenly over the year. It has no realizable value for spoiled units.

Required :

(1) Statement of equivalent production (average cost method)

(2) Statement of cost and distribution of cost

(3) Process accounts

[C.A. PCE. Nov. 2007]

Solution :

Statement of Equivalent Production (average cost method)

Input units	Particulars	Output Units	Equivalent Production			
			Materials		Conversion cost	
			% completed	Equivalent Units	% Completed	Equivalent Units
4000	Opening WIP	--	--			
16000	Introduced and	14,400	100	14,400	100	14,400
	Completed to next					
	Normal spoilage	1,440	100	1,440	100	1,440
	Abnormal spoilage	1,160	100	1,160	100	1,160
	Closing WIP	3,000	100	3,000	66.67	2,000
20000		20000		20000		19000

Statement showing cost of each element

Particulars		Materials	Conversion cost
Opening		30,000	29,200
Cost in process		1,20,000	1,60,800
Total	(a)	1,50,000	1,90,000
Equivalent Units	(b)	20,000	19,000
Cost per unit	(a ÷ b)	7.50	10.00

Statement showing distribution of cost

Particulars	Equivalent Units	Cost per unit	(Rs.)	
Units completed				
Materials	14,400	7.50	1,08,000	
Conversion cost	14,400	10.00	1,44,000	2,52,000
Normal spoilage	1,440	17.50		25,200
(10 %)				

Particulars	Equivalent Units	Cost per unit	(Rs.)	
Closing stock :				
Material	3,000	7.50	22,500	
Conversion cost	2,000	10.00	20,000	42,500
Abnormal Stock:				
Material	1,160	7.50	8,700	
Conversion Stock	1,160	10.00	11,600	20,300

Dr. Process A/c. Cr.

Particulars	Rs.	Particulars	Rs.
To Opening WIP	59,200	By Profit and Loss	
		A/c.	
To Material	1,20,000	(abnormal)	20,300
Introduced			
To Conversion cost	1,60,800	By Transfer to Next	2,77,200
Incurred		Process	
		By Closing WIP	42,500
	340000		**3,40,000**

Illustration.11

GH & Co. manufactures a product. The process costing is followed and work-in-progress stocks at the end of each month are valued at FIFO basis.

At the beginning of the month of June, the inventory of work-in-progress showed 400 units, 40% complete, valued as follows:

	Rs.
Material	3,600
Labour	3,400
Overheads	1,000
Total	8,000

In the month of June, materials were purchased for Rs.75,000. Wages and overheads in the month amounted to Rs. 79,800 and Rs. 21,280 respectively. Actual issue of material to production was Rs. 68,500. Finished stock in the month was 2500 units. There was no loss in process.

All the end of the month, the work-in-process inventory was 500 units, 60 percent complete as to labour and overheads and 80 % complete as to materials.

Prepare a Process Account for recording the month's transactions and prepare a Process Cost Sheet showing total and units costs [I.C.W.A., Final]

Solution:

Dr. Process A/c. Cr.

Particulars	**Units**	**Rs.**	**Particulars**	**Units**	**Rs.**
To Opening	400	8,000	BY Transfer to		
Stock					
To Material	2,600	68,500	Finished stock	2,500	1,56,094
To Labour		79,800	By Work-in-		
To Overheads		21,280	Progress	500	21,486
	3000	**1,77,580**		**3000**	**1,77,580**

Working Note :

Statement of Equivalent Production (Units)

Input	Particulars	Output	Material		Labour		Overhead	
			Qty.	%	Qty.	%	Qty.	%
400	Opening Stock Completely Processed Work-in-Progress	400	240	60	240	60	240	60
2600		2,100	2,100	100	2,100	100	2,100	100
		500	400	80	300	60	300	60
3000		3,000	2,740		2,640		2,640	

Working Note :

(1) For opening stock also equivalent production has been calculated as it was partly complete and it has to be converted into finished product in this period. They werecompleted 60 % in this period.

(2) Total units produced in a month are 2,50 units. Out of this 400 units of opening stock has been deducted because they have been partly processed in this particular month and we have already calculated equivalent units of opening stock. Only, 2,100 units have been introduced and completed in theparticular period.

(3) For closing stock also equivalent production in terms of total units completed has been calculated.

Statement of Element of cost on the basis of Equivalent Units

	Cost Rs.	**Equivalent Units**	**Cost per unit Rs.**
Material	68,500	2.740	25.000
Labour	79,800	2.640	30.2273
Overheads	21,280	2.640	8.0606

Statement of Apportionment of Cost

Particulars		Equivalent Units	Cost Per Unit Rs.	Details Rs.	TotalRs.
Op. Stock	Material	240	25.0000	6,000	
Processed					
	Labour	240	30.2273	7,255	
	Overheads	240	8.0606	1,935	15,190
Completely	Material	2,100	25.0000	52,500	
Processed					
	Labour	2,100	30.2273	63,477	
	Overheads	2,100	8.0606	16,927	1,32,904
Work-in-	Material	400	25.0000	10,000	
Process					
	Labour	300	30.2273	9,068	
	Overheads	300	8.0606	2,418	21,486
				TOTAL	**1,69,580**

Total Cost of 2500 units

	Rs.
Cost of opening stock	8,000
Additional cost of opening stock processed	15,190
Cost of completely processed	1,32,904
	1,56,094

Illustration 12

The following data is available in respect of Process I forFebruary 1990.

(1) Opening stock of work-in-process 800 units at atotal cost of Rs. 4,000.

(2) Degree of completion of opening work inprocess

Materials 100 %

Labour 60 %

Overheads 60 %

(3) Input of materials at a total cost of Rs. 36,800for 9,200 units

(4) Direct wages incurred Rs. 16,7540

(5) Production overheads Rs. 8,370

(6) Units scrapped 1,200 units. The stage ofcompletion of these units was

Materials 100 %

Labour 80 %

Overheads 80 %

(7) Closing work-in-process : 900 units. The stageof completion of these units was :

Materials 100 %

Labour 70 %

Overheads 70 %

(8) 7,900 units were completed and transferred tothe next process.

(9) Normal Loss is 80 % of the total input (opening stock plus units put in)

(10) Scrap value is Rs. 4 per unit

You are required to :

(a) Compute equivalent production

(b) Calculate the cost per equivalent unit for each element

(c) Calculate the cost of abnormal loss (or gain), closing work in process and the units transferred to the next process using the FIFO method.

(d) Show the Process Account for February 1990

[C.A., Inter]

(a) Statement of Equivalent Production (FIFO Method)

input		Output		Equivalent			
Particulars	Units	Particulars	Units	Material		Labour & Overheads	
				Units	%	Units	%
Op. Stock		Units					
of		completed					
W.I.P.	800	Work on Op.	800	--		320	40
		stock					
Units		New units	7100	7100	100	7,100	100
	9,200	Closing stock	900	900	100	630	70
Introduced							
		Normal Loss	800	--		--	
		Abnormal	400	400	100	320	100
		Loss					
	10,000		10,000	8,400		8,370	

(b) Statement of cost per equivalent units for each element

Particulars	CostRs.	Equivalent Unit	Cost Per Unit
Material 36,800			
Less : Scraprealization			
(800 units @ Rs. 4) 3,200	33,600	8,400	4.00
Labour	16,740	8,370	2.00
Overheads	8,370	8,370	1.00

I Statement showing cost of abnormal loss, closing WIP and units transferred to the next process :

Particulars	Cost per unit Rs.	Equivalent unit	Total cost Rs.
Abnormal Loss			
Materials	4.00	400	1,600
Labour	2.00	320	640
Overheads	1.00	320	320
			2,560
Closing WIP			
Material	4.00	900	3,600
Labour	2.00	630	1,260
Overheads	1.00	630	630
7900 units transferred to next			5,490
Process			
(i) Cost of opening WIP (80 units)			4,000
(ii) Cost incurred on opening WIP			
Material	--	--	
Labour	2.00	320	640
Overheads	1.00	320	320
			960
(iii) Cost of completing 7100 units			
Material	4.00	7100	28400
Labour	2.00	7100	14200
Overheads	1.00	7100	7100
			49700
Total (I + ii + iii)			**54600**

Dr. Process A/c. for February 1990 Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening	800	4000	By Finished	7900	54660
WIP			Goods		
To Materials	9200	36800	By Closing WIP	900	5490
To Labour	--	16740	By Normal Loss	800	3200
To Overheads	--	8370	By Abnormal	400	2560
			Loss		
	10000	65910		**10000**	**65910**

6.8 EXERCISE

6.8.1 Objective type

Answer in Brief

6.8.1.1 State any four features of process costing.

6.8.1.2 Define process costing,

6.8.1.3 What do you mean by normal loss? How is it treated inprocess cost accounts?

6.8.1.4 What do you mean by abnormal loss? How is it treated inprocess cost accounts?

6.8.1.5 Distinguish between normal loss and abnormal loss.

6.8.1.6 What do you mean by abnormal effective? How is it treatedin process cost accounts?

6.8.1.7 What do you mean by inter process profit? What purposedoes it serve?

6.8.1.8 What do you mean be equivalent production?

6.8.1.9 Name any four industries in which process costing isapplicable?

6.8.1.10 Enumerate any two advantages of process costing.

_____

_____

_____

_____

6.8.1.11 Enumerate any two disadvantages of process costing.

_____

_____

_____

_____

6.8.1.12 What do you meant by equivalent units?

_____

_____

_____

_____

6.8.2 Multiple Choice Questions

1. The type of spoilage that should not affect the cost ofinventories is
   (a) Abnormal spoilage (c) Seasonal spoilage
   (b) Normal spoilage (d) Indirect spoilage
2. Materials may not be put into process
   (a) At the beginning of an operation
   (b) Continuously
   (c) At the end of the operation
   (d) In the shipping department.
3. Process cost method is especially suitable for
   (a) Custom production (c) FIFO
   (b) Standard costs (d) LIFO
4. In process costing, costs follow
   (a) Price rise (c) Product flow
   (b) Price declines (d) Finished goods

5. When average costing is used, the opening inventory costsare
   (a) Kept separate from the costs for the new period
   (b) Added to the costs of the new period
   (c) Subtracted from the new costs
   (d) Averaged with other costs to arrive at total cost.

6. A disadvantage of FIFO costing is that
   (a) The first units produced cannot be distinguished fromlater production.
   (b) Several units costs are used at the same time.
   (c) The units have to be kept separate
   (d) The shipping costs are higher

7. Which of the following method of costing can be used in alarge oil refinery?
   (a) Process costing (c) Unit costing
   (b) Operating costing (d) Job costing

8. Which of the following paid is odd :
   (a) Construction-Contract costing
   (b) Ship-building-Job costing
   (c) Brick manufacturing – Process costing
   (d) Transport undertaking – Operating costing

9. A product which has practically no sales or utility value is
   (a) Waste (c) Spoilage
   (b) Scrap (d) Defectives

10. Trimmings in timber industry should be treated as a :
   (a) Waste (c) Spoilage
   (b) Scrap (d) Defectives

11. The type of process loss that should not affect the cost ofinventory is
   (a) Abnormal loss (c) Seasonal loss
   (b) normal loss (d) standard loss

12. The stage where joint products are separated from eachother is known as
   (a) break-even point (b) angle of incidence
   (c) split-off point

13. Fifty units are put in a process at a total cost of Rs. 90. Wastage is normally 10% without any scrap value. If output is 40 units the amount of abnormal loss would be

    (a) Rs. 80 (c) Rs. 10

    (b) Rs. 8 (d) Rs. 9

14. Abnormal loss is charged to

    (a) process account (b) costing profit and loss account

    (c) Normal loss account

(Answers: 1(a), 2 (d), 3 (b), 4(c), 5(a), 6(b), 7(a), 8(c), 9(a),10(b).)11 (a), 12(c), 13 (c), 14(b))

6.8.3 Short notes

6.8.3.1 Write a short note-Inter process profits.(Apr-08)

6.8.3.2 Write a Short Note-Treatment of losses in Process.(Apr 07)

6.8.3.3 Write a short Note-Equivalent Production. (Apr-07)

6.8.3.4 Describe the main features of process costing.

6.8.3.5 Explain the features of process costing

6.8.3.6 How would you treat abnormal gain?

6.8.4. Long questions

1. What do you mean by inter-process profits in process cost accounts.

2. Explain the methods to be adopted in the treatment of joint products and by-products in process account.

3. What do you understand by `Normal' and `Abnormal' Wastageduring the process of manufacture?

4. Describe briefly the method known as Process Costing, statingfour types of manufactures which would be suitable for its application. A description of the method of dealing with by- products is not required.

5. Explain the concept of Equivalent Production. Discuss the two methods of its valuation.

Practical Problems

Illustration 1:

During a particular period 2,000 units at a cost of ` 60,000 were

introduced into Process 'A' (at the beginning). The normal loss was estimated at 5% of the input. At the end, 1,400 units were producedand transferred to the Process 'B', 460 units being partially completed and 140 units scrapped. The partially completed units had reached the following state of production:

Materials 100% complete

Labour 50% complete

Overheads 50% complete

Additional costs incurred during the process were:Materials Rs. 17,000

Labour Rs.33, 400

Overheads Rs. 16,700

The units scrapped realised Rs.10 per unit. Prepare Process 'A' A/c with all relevant statements.

(Ans.: Equivalent Units, Material: 1,900, Labour: 1670, Overheads: 1,670 Transfer to Process B 1,400 units @Rs. 70 p.u.)

(M.Com. Mar. 2002)

Illustration 2 :

XYZ Ltd. is engaged in process industry. During the month August 2000, 2000 Units were introduced in process 'X'. The normal loss was estimated at 5% of input. At the end of the month 1,400 units had been produced and transferred to process 'Y'. 460 units were incomplete and 140 units, after passing through fully the entire process had to be scrapped. The incomplete units had reached the following state of completion:

Materials 75% Completed

Labour 50% Completed

Overheads 50% Completed

Following are the further information on the process 'X' :

Cost of the 2000 units Rs. 58,000Additional Direct materials Rs. 14,400 Direct Labour Rs. 33,400

Direct OverheadsRs. 16,700

Units scrapped realised Rs. 10 each

Prepare statement of equivalent production, statement of cost, statement of evaluation and process 'X' account.

(M.Com. Mar. 2005)

Ans. (Equivalent Units, Material: 1,785, Labour: 1,670, Overheads: 1,670)

Illustration 3 : (FIFO)

The following information is available for Process IV of Swastik Fabrications Ltd. for the month of March 2005.

Opening Stock: 4,800 units @ Rs.16,500

Degree of Completion: Material 70%

Labour 60%

Overheads 60% Transfer from Process III: 30,600 units @ Rs. 30,600 Transfer to Process V: 27,600 units

Direct Material introduced in Process IV: Rs. 13,440 Direct Labour introduced in Process IV: Rs. 39,420 Production overheads incurred Rs. 52,560

Units scrapped: 2,400

Degree of completion:	Material	100%
Labour	70%	
Overheads		70%

Closing stock 5400 units

Degree of completion:	Material	60%
	Labour	40%
	Overheads	40%

There was a normal loss of 10% of production in the process.Unites scrapped were realised at Re. 1 per unit. From the above information prepare:

6.8.3.7 Statement of equivalent production

6.8.3.8 Cost of equivalent unit for each element of the cost, theloss, the work-in-process, etc.

6.8.3.9 Process account using FIFO method.
(M.Com. Oct. 2005)

Ans. (Equivalent Units, Material I: 27,600, Material II: 26,880, Labour: 26,460,Overheads: 26,460)

Illustration 4 : (FIFO)

The following data pertains to Process I for March 2003 of Beta Limited:

Particulars			**Units**	**Rs.**
Opening Work-in-Progress		… … … … .	1,500	15,000
Degree of completion :				
Materials 100%; Labour	and			
overheads 33⅓%				
Input of Materials		… … … … .	18,500	52,000
Direct Labour		… … … … .		14,000
Overheads		… … … … .		28,000
Closing Work-in-Progress		… … … … .	5,000	

Degree of Completion Materials 90% and Labour and Overheads30%.

Normal Process Loss is 10% of total input (opening work inprogress units + units put in).

Scrap value 2.00 per unit.

Units transferred to the next process 15,000 units.You are required to:

1) Compute equivalent units of production.
2) Compute cost per equivalent unit for each cost element i.e., materials, labour and overheads.
3) Compute the cost of finished output and closing work-in-progress.
4) Prepare the process and other Account.

Assume:

i) FIFO Method is used by the Company.

ii) The cost of opening work-in-progress is fully transferred to thenext process.

(M.Com. Mar.2006)

Ans. (Equivalent Units, Material: 16000, Labour:14,000, Overheads: 14,000)

Illustration 5: (Weighted Average)

From the following details prepare Statement at Equivalent Production, statement of Cost and find the value of: (a) Output transferred and (b) Closing work in progress

Opening work in progress (units)	2,000
Materials (100% Complete)	7,500
Labour (60 % Complete)	3,000
Overheads (60% Complete)	1,500
Units introduced into this process	8,000

There are 2,000 units in process at the end and the stage ofcompletion is estimated to be :

Materials	100%
Labour	50%
Overheads	50%

8,000 units are transferred to next process.The process costs for the period are:

Materials Rs. 1, 00,000

Labour Rs.78,000

Overheads Rs. 39,000

(M.Com. Oct. 2006)

Ans. (Equivalent Units, Material:10,000, Labour: 9,000, Overheads: 9,000)

Illustration 6 : (Average)

Shete and Shete Pvt. Ltd. gives the following particulars relating toprocess 'P' in its plants for the month of January 2007 :

Particulars		**Rs.**	**Rs.**
Work-in-Progress (500 units) on			
01-01-2007			
Material (100%)	… … … …	12,000	-
Degree of Completion Labour (50%)	… … … …	7,200	-
Overheads (50%)	… … … …	16,000	35,200
Units introduced during the Month			
January, 2007 – Units – 19,500	… … … …	-	-
Processing Cost incurred during the			
Month			
January, 2007 Materials	… … … …	4,65,500	-
Labour	… … … …	1,80,000	-
Overheads	… … … …	2,64,800	9,10,300

Particulars	**Units**
Output transferred to Process Q … … … …	18,200
Units Scrapped (Degree of Completion Material 100%,	1,400
Labour 80% and Overheads 80%) … … … …	400
Work-in-Progress (Closing Balance) … … … …	
(Degree of Completion-Materials 100%, Labour and Overheads	
50%)	

Normal loss in processing is 5% of total input and scrapped units fetch 2.50 each. Prepare the following statements for Process 'P'for January, 2007 :

a) Statement of Equivalent Production

b) Statement of Cost and Statement of Evaluation

c) Process 'P' A/c

d) Abnormal Loss A/cUse Average Method

(Mar. 07, adapted)

Ans. (Equivalent Units, Material: 19,000, Labour: 18,720, Overheads: 18,720)

Illustration 26 : (FIFO – No Losses)

Avdoot Ltd., a manufacturer of a specialized product, is havea process costing system. The stock of work-in-progress at the end of each month is valued on First in First Out (FIFO) basis. At the beginning of January 2008 the stock of work-in-progress was 2000 units (40% completed) which was valued as :

Material Rs. 18,000

Labour Rs. 17,000

Overheads Rs. 5,300

During the month of January 2008, actual issue of materials for the production purpose was Rs. 3,42,500. wages and overheads in the month of January, 2008 amounted to Rs. 4,02,600 and Rs. 1,12,200 respectively. Finished production taken into the stock in the month was 12,500 units. There was no loss in the process. At the end of the month of January, 2008 the stock of Work-in-Progress was 2500 units (60% complete as to Labour and Overheads and 80% complete as to materials). Prepare the following statements for January, 2008.

a) No. of units introduced in the process

b) Statement of Equivalent Production

c) Statement of Cost

d) Statement of Evaluation

e) Process Account.

(Apr. 08, adapted)(Equivalent Units, Material: 13,700, Labour: 13,200, Overheads:13,200)

Illustration 27 : (FIFO – Process A/c with Abnormal Loss)

From the following information prepare Process account as perFIFO assumption:

Opening stock Degree of completion

80 units @ Rs. 6 per unit Rs. 4,800

Material 60%

Labour 40%

Overheads 40%

Transfer from previous process : 12,000 units costing Rs. 16,350Transfer to next process : 9,700; Units scrapped 1,300 units Normal loss 10%; Closing stock : 1,800 units

Degree of completion

For units scrapped :		For closing stock :	
Material	100%	Material	60%
Labour	50%	Labour	50%
Overheads	50%	Overheads	50%

Scrap realised Re. 1.00 per unit

Other information	Rs.
Material	10,500
Labour	20,760
Overheads	16,470

(M.Com, Oct. 2008, adapted)(**Ans.** Equivalent Units, Material I: 10,900, Material II: 10,500, Labour: 10,380, Overheads: 10,380)

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7

ACTIVITY BASED COSTING

Unit Structure

7.0 INTRODUCTION

Cost Allocation or cost assignment is the process of identifying and assigning costs to the various cost objects. These cost objects could be those for which the company needs to find out the cost separately. A few examples of cost objects can be a product, customer, project, department, and so on. The need for cost allocation arises because some costs are not directly attributable to the particular cost object. In other words, these costs are incurred for various objects, and then the sum is split and allocated to multiple cost objects. These costs are generally indirect. Since these costs are not directly traceable, an accountant uses their due diligence to allocate these costs in the best possible way. It results in an allocation that could be partially arbitrary, and thus, many refer cost allocation exercise as the spreading of a cost. Cost allocation is the process of identifying, accumulating, and assigning costs to costs objects such as departments, products, programs, or a branch of a company. It involves identifying the cost objects in a company, identifying the costs incurred by the cost objects, and then assigning the costs to the cost objects based on specific criteria.

When costs are allocated in the right way, the business is able to trace the specific cost objects that are making profits or losses for the company. If costs are allocated to the wrong cost objects, the company may be assigning resources to cost objects that do not yield as much profits as expected.

7.1 TYPES OF COSTS

There are several types of costs that an organization must define before allocating costs to their specific cost objects. These costs include:

1. Direct cost

Direct costs are costs that can be attributed to a specific product or service, and they do not need to be allocated to the specific cost object.

It is because the organization knows what expenses go to the specific departments that generate profits and the costs incurred in producing specific products or services. For example, the salaries paid to factory workers assigned to a specific division is known than does not need to be allocated again to that division.

2. Indirect Cost

Indirect costs are costs that are not directly related to a specific cost object like a function, product, or department. They are costs that are needed for the sake of the company's operations and health. Some common examples of indirect costs include security costs, administration costs, etc. The costs are first identified, pooled, and then allocated to specific cost objects within the organization.

Indirect costs can be divided into fixed and variable costs. Fixed costs are costs that are fixed for a specific product or department. An example of a fixed cost is the remuneration of a project supervisor assigned to a specific division. The other category of indirect cost is variable costs, which vary with the level of output. Indirect costs increase or decrease with changes in the level of output.

3. **Overhead costs**

Overhead costs are indirect costs that are not part of manufacturing costs. They are not related to the labor or material costs that are incurred in the production of goods or services. They support the production or selling processes of the goods or services. Overhead costs are charged to the expense account, and they must be continually paid regardless of whether the company is selling goods or not .Some common examples of overhead costs are rental expenses, utilities, insurance, postage and printing, administrative and legal expenses and research and development costs.

7.2 COST DRIVER

A cost driver triggers a change in the cost of an activity. The concept is most commonly used to assign overhead costs to the number of produced units. It can also be used in activity-based costing analysis to determine the causes of overhead, which can be used to minimize overhead costs. A large number of cost drivers may be used within an activity-based costing system. If a business is only concerned with following the minimum accounting requirements to allocate overhead to produced goods, then just a single cost driver should be used. It is an activity that is the root cause of why a cost occurs. It must be applicable and relevant to the event that is incurring a cost. A cost driver assists with allocation expensesin a systematic manner that results in more accurate calculations of the true costs of producingspecific products.

Cost pool: It is an aggregate of all the costs associated with performing a particular business activity.

An activity cost driver refers to actions that cause variable cost to increase or decrease for a business. Therefore, identifying what product/service is causing particular costs can help the business to become more profitable by better understanding the specific activities that are driving the costs. **Allocating cost drivers appropriately is important in accurately determining the cost of producing a good or service, as well as making financial projections.**

Activity cost drivers are specific activities that cause variable expenses to be incurred. One variable expense can comprise more than a single activity cost driver. For example, machine hours and labor hours can be activity cost drivers in the manufacturing of a product.

All variable expenses can be broken down and looked at by one or several activity cost drivers, which can also be influenced by several factors. For example, if the minimum wage increases, it can cause the cost of producing a product to also increase.

Examples of Activity Cost Drivers

- Direct labour hours
- Machine setups required
- Number of customer contacts
- Number of customer change orders

7.3 METHODS OF ALLOCATING COST

Direct method of cost allocation

The direct method is considered the most simple method of allocating the cost of service departments to operating departments. In the direct method, interactions between service departments are ignored and costs are allocated just to operating departments. Under this method, the costs incurred by

service departments are not allocated to each other; rather, they are directly allocated to operating departments using some appropriate allocation base. In other words, we can say that the **direct method of departmental cost allocation** ignores the service provided by a service department to itself and to other service departments.

A firm generates various expenses that can be assigned to a specific "cost item" — such as a commodity, program, function, or service. These costs include anything from mop floors to functional equipment. You should, however, generate enough income to pay such corporation overhead expenditures. This means that revenue must surpass total costs. The direct allocation technique is one of numerous cost allocation strategies used to allocate indirect costs to activities. It is one of the most often used techniqueThe direct technique is the easiest in terms of cost allocation, even though it has several shortcomings. Nevertheless, because of its simplicity of using it, it became one of the most widely applied cost allocation techniques in recent years. In a nutshell, it assumes that service departments do not give facilities or services to each other, and it merely distributes the service departments' costs in the company's manufacturing departments.

The direct approach of transferring service department costs to the operational department is the simplest way of allocating costs between divisions. As a result of this technique, the expenses involved by service departments are not assigned to one another. Still, they are instead allotted straight to operational departments using a suitable rate of allocation.

The direct approach assigns the expenses of all the support departments to every other manufacturing unit calculated based on the rates of each operational department rates. Services that other support departments receive are not considered in this method of cost allocation. With the help of this approach, it is possible to completely charge operational departments with the overhead expenditures for which they are accountable. Firms that use the direct method completely transfer excess costs from service departments to inventories, even though there may be cross-costs across service departments, because of the nature of the business.

For instance, the cleaning crew offers services to sanitize all business buildings. In contrast, the maintenance department oversees the firm's machinery, and the information technology department oversees maintaining the organization's computer networks. Assume that a service Department 1 utilizes a few of the facilities provided by Service Department 2. Such services will be excluded from consideration throughout the cost allocation procedure. Because such services are not assigned to certain other service divisions, many cost auditors think that the direct approach is not as precise as other methods.

Advantages and disadvantages

Many organizations use direct method for allocating departmental costs because it is very simple and easy to employ.

The major disadvantage of direct method is that it ignores interdepartmental services and can therefore lead to distorted products and services cost. Moreover, it is commonly considered a less accurate method when compared with other methods available for departmental cost allocation.

There is, however, a disadvantage to using this approach. Direct allocation does not enable companies to shift expenditures from one support department to another support department and vice versa. Depending on the nature of your company, this is a possibility. Assume that there is an HR and maintenance department. Allowing for the possibility that almost all the HR and maintenance department support expenditures are assigned to an operational unit through direct allocation. As a result, HR and maintenance department expenses are completely depleted.

Q.1) The Murphy Company has two service departments and two operating departments as shown below:

	SERVICE DEPARTMENTS		OPERATING DEPARTMENTS		
	Dept. A	**Dept. B**	**Dept. X**	**Dept. Y**	**Total**
Departmental costs before allocation	$180,000	$45,000	$130,500	$344,500	$700,000
Employee hours	6,000	3,000	9,000	15,000	33,000
Space occupied - square feet	5,000	100	3,000	22,000	30,100

The two service departments provide service to each other as well as to operating departments. The department A's cost is allocated on the basis of employee hours and department B's cost is allocated on the basis of square feet occupied.

Required: Allocate the cost of service departments to operating departments using direct method of cost allocation.

Solution

	SERVICE DEPARTMENTS		OPERATING DEPARTMENTS		
	Dept. A	**Dept. B**	**Dept. X**	**Dept. Y**	**Total**
Departmental costs before allocation	$180,000	$45,000	$130,500	$344,500	$700,000
Allocation:					
Department A cost (9/24,15/24)*	(180,000)		67,500	112,500	
Department B cost (3/25, 22/25)**		(45,000)	5,400	39,600	
	$ 0	$ 0	$203,400	$496,600	$700,000

Department A's cost has been allocated on the basis of employee hours:

9,000 hours + 15,000 hours = 24,000 hours.

Allocated to department X: $180,000 × (9/24) = $67,500
Allocated to department Y: $180,000 × (15/24) = $112,500

Department B's cost has been allocated on the basis of spaces occupied:

3,000 square feet + 22,000 square feet = 25,000 square feet.

Allocated to department X: $45,000 × (3/25) = $5,400
Allocated to department Y: $45,000 × (22/25) = $39,600

On the other hand, the human resources department assists the maintenance department throughout the same time frame. It goes without saying that the maintenance department should bear a portion of the costs of human resources. However, the expenditures of the maintenance department have already been transferred in whole to another operating unit.

7.4 STEP DOWN METHOD

In the step down method, one service department's costs are allocated to another service department as well as operating departments that use it. Any amount of the allocation base attributable to the service department whose cost has already been allocated is ignored. Each service department assigns its own costs to operating departments plus the costs that have been allocated to it from other service departments.

The step technique of distributing service department expenses is the second way of allocating costs. As part of a sequential process, service expenses are allocated to operational departments and other service departments by using this approach. The following are the critical phases in the allocation process:

1. Service departments that offer services to the greatest number of other service departments or that have the greatest proportion of their expenses used by the other service departments receive priority in allocating their expenses to certain other service departments. It also distributes the remainder of its expenses across the operational divisions.

2. The service department that offers services to the second-highest number of other services departments or has the second-highest proportion of its expenses absorbed by other service departments, oversees allocating its expenses towards the other service departments. At this point, all the company's other expenses have been assigned to the operational divisions.

3. Till the service department offering services to the fewest amount of other service departments or having the lowest proportion of its expenses absorbed by the other service departments is assigned its expenses, the procedure is repeated. The procedure comes to an end when all the allotment has been accomplished.

Advantages

This technique is easy and uncomplicated to execute and can be finished quickly. Due to the higher level of convenience, supervisors willing and eager to reduce the time spent on record keeping and forming accounting reports are far more likely to select it, even though the precision offered is not the highest in this cost allocation.

Q.1) The TCS Company uses the step method for allocating the costs of its service departments to operating departments. The company has two service departments and two operating departments. The selected information for the four departments is given below:

	SERVICE DEPARTMENTS		OPERATING DEPARTMENTS		
	Dept. A	**Dept. B**	**Dept. X**	**Dept. Y**	**Total**
Departmental costs before allocation	$180,000	$45,000	$130,500	$344,500	$700,000
Employee hours	6,000	3,000	9,000	15,000	33,000
Space occupied - square feet	5,000	100	3,000	22,000	30,100

The company uses employee hours as the base for allocating the cost of department A and space occupied for allocating the cost of department B.

Required: Allocate the cost of service departments to operating departments using step down method.

Solution

	SERVICE DEPARTMENTS		OPERATING DEPARTMENTS		
	Dept. A	**Dept. B**	**Dept. X**	**Dept. Y**	**Total**
Departmental costs before allocation	$180,000	$45,000	$130,500	$344,500	$700,000
Allocation:					
Department A cost (3/27, 9/27, 15/27)*	(180,000)	20,000	60,000	100,000	
Department B cost (3/25, 22/25)**		(65,000)	7,800	57,200	
Total costs after allocation	$ 0	$ 0	$198,300	$501,700	$700,000

Allocation of department A's cost:

Allocation ratio:

Department B: 3,000/(3000 + 9000 + 15,000) = 3,000/27000 or 3/27
Department X: 9,000/(3000 + 9000 + 15,000) = 9,000/27000 or 9/27
Department Y: 15,000/(3000 + 9000 + 15,000) = 15,000/27000 or 15/27

Allocated to department B: $180,000 × (3/27) = $20,000
Allocated to department X: $180,000 × (9/27) = $60,000
Allocated to department Y: $180,000 × (15/27) = $100,000

Allocation of department B's cost:

Allocation ratio:
Department X: 3,000/(3,000 + 22,000) = 3,000/25,000 or 3/25
Department Y: 22,000/(3,000 + 22,000) = 22,000/25,000 or 22/25

Total cost of department B: $45,000 + $20,000 = $65,000

Allocated to department X: $65,000 × (3/25) = $7,800
Allocated to department Y: $65,000 × (22/25) = $57,200

Q.2) The Religare Company provides the following selected data about its three service and two operating departments:

	SERVICE DEPARTMENTS			OPERATING DEPARTMENTS		
	Dept A	**Dept B**	**Dept C**	**Dept X**	**Dept Y**	**Total**
Overhead costs	$180,000	$105,000	$48,000	$200,000	$267,000	$800,000
Number of employees	60	35	140	315	210	760
Square feet of space occupied	5,000	10,000	20,000	40,000	100,000	175,000
Hours of press time	--	--	--	15,000	30,000	45,000

The order and bases for allocating service department costs is given below:

1. Department A; allocation base is "number of employees".
2. Department B; allocation base is "space occupied".
3. Department C; allocation base is "hours of time".

Required: Allocate the cost of service departments to operating departments using step down method of cost allocation.

Solution

	ALLOCATION BASES					
	Department A		**Department B**		**Department C**	
Department B data	35 Empl.	1/20	--		--	
Department C data	140 Empl.	4/20	20,000 Sq. feet	1/8	--	
Department X data	315 Empl.	9/20	40,000 Sq. feet	2/8	15,000 Hrs.	1/3
Department Y data	210 Empl.	6/20	100,000 Sq. feet	5/8	30,000 Hrs.	2/3
	700 Empl.	20/20	160,000 Sq. feet	8/8	50,000 Hrs.	3/3

	SERVICE DEPARTMENTS			OPERATING DEPARTMENTS		
	Dept A	**Dept B**	**Dept C**	**Dept X**	**Dept Y**	**Total**
Overhead costs	$180,000	$105,000	$48,000	$200,000	$267,000	$800,000
Allocation:						
Department A (1/20, 4/20, 9/20, 6/20)	(180,000)	9,000	36,000	81,000	54,000	
Department B (1/8, 2/8, 5/8)		(114,000)	14,250	28,500	71,250	
Department C (1/3, 2/3)			(98,250)	32,750	65,500	
	$ 0	$ 0	$ 0	$342,250	$457,750	$800,000

7.5 RECIPROCAL METHOD OF COST ALLOCATION

Reciprocal method is a method of allocating service department costs to other departments that gives full recognition to interdepartmental services .Although it is the most accurate, it is also the most complicated. In the reciprocal method, the relationship between the service departments is recognized. This means service department costs are allocated to and from the other service departments. The reciprocal method gives full recognition to interdepartmental services. Under the step method, only partial recognition of interdepartmental services is possible. The step method always allocates costs forward never backward. The reciprocal method, by contrast, allocates service department costs in both directions. The reciprocal allocation requires the use of simultaneous equations.Other names for the reciprocal method are simultaneous solution method, cross allocation method, matrix allocation method and double distribution method.

Under this method the true cost of the service departments are computed first with the help of simultaneous equations and these are then distributed to producing departments on the basis of given percentage or ratio. Remember that true cost of the service department means the cost of the service department which includes original cost of the department plus the share of the other service department. The main advantage of this method is to have an accurate distribution in a single step in the distribution summary.

Use of Reciprocal Method

This method is rarely used in practice for two reasons. First, the computations are relatively complex. Although the complexity issue could be overcome by use of computers, there is no evidence that computers have made the reciprocal method more popular. Second, the step method usually provides results that are a reasonable approximation of the results that the reciprocal method would provide. Thus, companies have little motivation to use the more complex reciprocal method.

Q.1) A company has two service and two producing departments. The two service departments serve not only to producing departments but also to each other. The departmental estimates for the next year are as follows.

Producing	**departments:**	
A		
B		50,000
Service	**departments:**	40,000
X		10,000
Y		8,800

The service departments costs are to be distributed as under:
Cost of X : 50% to A, 40% to B, and 10% to Y
Cost of Y : 40% to A, 40% to B, and 20% to X

Required:
Transfer the service departments costs to each other and to producing departments.

Solution:
Now we solve the given illustration first using the simultaneous equation method as follows:**Original costs of service departments:**

X = Rs.10,000
Y = Rs. 8,800

After getting the share from distribution of service departments:

X = Rs. 10,000 + 20% Y
Y = Rs. 8,800 + 10% X

By putting the value of Y in equation (1)

X = Rs. 10,000 + 20%(Rs.8,800 + 10%X)
X = Rs. 10,000 + 1760 + 0.2X
X – 0.02X = Rs. 10,000 + Rs.1,760
0.98X = Rs. 11,760
X = 11760 / 0.98
= Rs. 12,000

By putting the value of X in equation (2)

Y = Rs. 8,800 + 10%(Rs. 12000)
Y = Rs. 8,800 + Rs. Rs. 1,200
= Rs. 10,000

Distribution Summary

Department	**Producing**		**Service**	
Original costs				
Distribution of service department costs:	**A** Rs 50,000	**B** Rs 40,000	**X** Rs 10,000	**Y** Rs 8,8001,200
X	6,000	4,800	(12,000)	(10,000)
Y	4,000	4,000	2,000	
Total departmental overheads	60,000	48,800	Nil	Nil

7.6 ACTIVITY BASED COSTING

Activity based costing (ABC) assigns manufacturing overhead costs to products in a more logical manner than the traditional approach of simply allocating costs on the basis of machine hours. Activity based costing first assigns costs to the activities that are the real cause of the overhead. It then assigns the cost of those activities only to the products that are actually demanding the activities. ABC works best in complex environments, where there are many machines and products, and tangled processes that are not easy to sort out. Conversely, it is of less use in a streamlined environment where production processes are abbreviated, so that costs are easy to assign.

Activity based costing is basically a change in accent. People perform activities and activities use resources. Thus, by controlling activities the manager is making sure that costs are controlled at their source. A wise manager will not focus on how to estimate product costs, but will focus more on why the costs were there in the first place. When intending an activity based costing system this should be utilized as a departure point.

Advantages of Activity Based Costing System

- The first and most significant benefit is the accuracy in the procedure of costing with regards to the product line, the consumers of the product, the stock-keeping units employed by the administration and the channel and group which streamline the flow of the product from the maker to the consumer.
- This system better helps in the procedure of understanding the concept of overhead costs i.e. the distribution of common business resources as they are utilized by particular product lines and their association to particular cost driver.
- The system is simple to interpret and understand is it is available, useable and specifically implement capable across all norms of business set-ups.
- This procedure consumes unitary cost, or marginal cost as the calculation base in comparison to the conventional cost accounting techniques which employ total cost.
- This system is specifically useful in recognizing and ear-marking some of the matters business activities which are a stress or burden on the business i.e. wasteful or non value adding services..
- This procedure permits firms to implement costing policies across another diagonal of the company as business procedures, supply chains and value addition channels are capably and optimally analyzed in this procedure.

- This system mimics the actual business procedure as the appropriation of common pool resources takes place in the same way as common resources are utilized in the business.
- Disadvantages of Activity Based Costing System
- Data collection procedure for this system is very time consuming.
- The capital expense on the activity based system and its subsequent running costs can be a road block for companies.
- The system is very apparent which some managers would not authorize of as they would like to keep some things out of the view of the owners of the firm.
- ABC Costing System is very costly to implement and maintain in a manufacturing and serving departments. Data concerning numerous activity measures must be collected, checked, and entered into the system.
- ABC costing systems produces the reports that are different from the profit and loss reports produced through traditional costing systems.
- As most of the companies are using , traditional costing systems, so because of the difference in the costing basis the costing and financial reports of the two companies of the same industry could not be compared for performance evaluation purposes.
- Adaptability of ABC Costing System is not suitable for all kind of companies because small companies have not many resources to ad
- Data Produced through ABC Costing System can easily misinterpret and can lead towards wrong decisions. So manager should use the data produced through ABC Costing System with extreme care and should assign the costs that are relevant to the products, customers and should not consider the other cost objects that are irrelevant.
- ABC costing system does not comply with the GAAP and a company has to produce its reports for internal and external purposes by using traditional and ABC costing system both at a time.
- In ABC costing system costs are allocated on the base of cost drivers and activities undertaken to manufacture the product, definitely, it provides the accurate and proper allocation of the costs to the products but there is a danger of over or under costing of the products when irrelevant cost drivers or activities are assigned to the products or services produced.

Steps in ABC

- Identify which activities are necessary to create a product
- Separate each activity into its own cost pool

- Assign activity cost drivers to each cost pool
- Divide the total overhead in each cost pool by the total cost drivers to get your costdriver rate
- Compute how many hours, parts, units, etc. that the activity used and multiply it by thecost driver rate to find total cost
- Calculate Cost per Unit by dividing the Total Cost by Total Units produced.

Uses of ABC

- Identification of necessary activities: The ABC system shows how overhead is used, which helps to determine whether certain activities are necessary for production.
- Focus on Value adding activities: The Activity Based Costing helps the management on focusing the forces on value adding activities and eliminate non-value adding activities.
- Ensuring profit margin: The specific allocation of costs also helps to set prices that produce a healthy small business profit margin.
- Product pricing: With an ABC system, the business can assign costs to each activity in the production process, allowing it to more accurately set a price that accounts for howmuch it costs to create a product.
- Measures to improve productivity: The accurate cost information helps themanagement to adopt productivity improvement approaches like Total Quality Management (TQM), Business Process Re-engineering (BPR) etc.
- Help in deciding Make or Buy: The management can take make or buy decisions by considering the cost of manufacture of a product or sub contract the same with an outside agency through Activity Based Costing analysis.

7.7 DIFFERENCE BETWEEN TRADITIONAL COST SYSTEM AND ABC SYSTEM

Basis	**Traditional**	**ABC**
1. Cost pools	One or limited number	Many
2. Applied Rate	Volume based	Activity Based
3. Applied for	Labour Intensive	Capital Intensive
4. Benefits	Simple, Inexpensive	Accurate product costing, identification of necessary activities etc

Basis	Traditional	ABC
5. Cost assignments	Primary and secondary distribution ofOverhead and then allocation of Overhead as per the suitable rate	Allocation of cost pool based on cost drivers then allocation of costs to product or service based on the drivers used by the particular product or service
6. Focus	Departments or responsibility centres	Processes and activities

7.8 PRACTICAL SUM

Problems involving calculations of Total cost and CPU under both Traditional and ABCmethods.

Question:

Amrit Company produces 3 products A, B and C. The company follows Activity Based Costingsystem. Information related to various costs of these products for the last year:

Particulars	A	B	C
Production and Sales (Units)	15000	12000	18000
Selling Price p.u. (Rs.)	7.5	12	13
Raw Material Usage (kg) p.u.	2	3	4
Direct labour hours p.u.	0.1	0.15	0.2
Machine Hours p.u.	0.5	0.7	0.9
No. of Production runs p.a.	16	12	8
No. of purchase orders p.a.	24	28	42
No. of deliveries to retailers p.a.	48	60	32

The price of Raw materials remained constant through out the year at Rs.1.2 per kg and the labour cost was Rs.14.8 per hour. The annual Overhead costs are as follows:

Overheads	Rs
Machine set up costs	26550
Machine running costs	66400
Procurement Costs	48000
Delivery costs	54320

Solution: Traditional Method

a) Calculation of Total Overhead

Overheads	**Rs**
Machine set up costs	26550
Machine running costs	66400
Procurement Costs	48000
Delivery costs	54320
Total	195270

b) Calculation of Overhead Absorption rate

Particulars	**A**	**B**	**C**	**Total**
Production Volumes	15000	12000	18000	
Labour hours p.u.	0.1	0.15	0.2	
Total Labour hours	1500	1800	3600	6900

Overhead absorption rate = 195270/6900 = Rs.28.30 per hour.

c) Calculation of Cost p.u.

Particulars	**A**	**B**	**C**
Raw material cost (Usage * Rs.1.20)	2.4	3.6	4.8
Direct Labour Cost (Labour hours * Rs.14.80)	1.48	2.22	2.96
Overhead (Labour hours * Rs.28.30)	2.83	4.25	5.66
CPU	6.71	10.07	13.42

ABC Method

a) Calculation of Overhead Absorption rate

Cost Pool	**Rs.**	**Cost Driver**		**Rate of OH per activity (Rs.)**
Machine costs setup	26550	No. of Production runs p.a.	(16+12+8) = 36 runs	26550/36= 737.50 per run
Machine costs running	66400	No. of Machine Hours p.a.	(7500+8400+16200)# = 32100 hours	66400/32100 = 2.0685 per hour
Procurement Costs	48000	No. of purchase orders p.a.	(24+28+42) = 94 orders	48000/94= 510.6383per order
Delivery costs	54320	No. of deliveries to retailers p.a.	(48+30+62) = 140 deliveries	54320/140= 388 per delivery

Total Machine hours p.a. = Machine hours p.u. * Total units producedA = 0.5*15000 = 7500

B = 0.7*12000 = 8400 C = 0.9*18000 = 16200

b) Calculation of Cost p.u.

Particulars	**A**	**B**	**C**
Material Cost	2.4	3.6	4.8
Labour Cost	1.48	2.22	1.96
Overhead:##			
Machine Setup Costs	(737.50*16)/ =15000 0.7867	(737.50*12)/ =12000 0.7375	(737.5*8)/ = 18000 0.3278
Machine running Costs	(2.0685*7500)/ = 15000 1.034	(2.0685*8400)/ =12000 1.4479	(2.0685*16200)/ =18000 1.8616
Procurement Costs	(510.6383*24)/ =15000 0.817	(510.6383*28)/ =12000 1.1915	(510.6383*42)/= 18000 1.1915
Delivery costs	(388*48)/ = 15000 1.2416	(388*30)/ = 12000 0.97	(388*62)/ = 18000 1.3364
Total CPU	7.7593	10.1669	11.4773

Overheads p.u. for products A, B and C

= (Overhead absorption rate* No. of cost drivers used by the individual products p.a.)/ No. of units produced

Multiple Choice Question

1. Activity-based costing:
   a) Uses a plant-wide overhead rate to assign overhead
   b) Is not expensive to implement
   c) Typically applies overhead costs using direct labor-hours
   d) Uses multiple activity rates

2. Assigning overhead using ABC often:
   a) Shifts overhead costs from high-volume products to low-volume products
   b) Shifts overhead costs from low-volume products to high-volume products
   c) Provides the same results as traditional costing
   d) Requires one predetermined overhead rate

3. Painting the product would be an example of which activity level groups

   a) Facility-level activity

   b) Product-level activity

   c) Unit-level activity

   d) Batch-level activity

4. X Company uses activity-based costing for Product B and Product D. The total estimated overhead cost for the parts administration activity pool was Rs.550,000 and the expected activity was 2000 part types. If Product D requires 1200 part types, the amount of overhead allocated to product D for parts administration would be:

   a) Rs.275,000

   b) Rs.300,000

   c) Rs.330,000

   d) Rs.345,000

5. Plant depreciation is an example of which activity-level group?

   a) Unit-level activity

   b) Facility-level activity

   c) Batch-level activity

   d) Product-level activity

6. B Company uses activity-based costing and has the following activity cost pools and estimated overhead cost for each pool:

   Machine related Rs.350,000

   Handling material Rs.240,000

   Processing purchase orders Rs.720,000

   General factory Rs.500,000

   The amount of total estimated overhead is:

   a) Rs.13,10,000

   b) Rs.10,90,000

   c) Rs. 850,000

   d) Rs.18,10,000

7. Product design is an example of which activity-level group?

   a) Product-level activity

   b) Facility-level activity

   c) Batch-level activity

   d) Unit-level activity

8. One of T Company's cost pools is parts administration. The expected overhead cost for that cost pool was Rs.380,000 and the expected activity was 5,000 part types. The actual overhead cost for the cost pool was Rs.420,000 at an actual activity of 6,000 part types. The activity rate for that cost pool was:

   a) Rs.63 per part type

   b) Rs.76 per part type

   c) Rs.70 per part type

   d) Rs.84 per part type

9. P Company produces three types of products- product A, product B and product C. Product A requires 200 machine setups and machine hours used on it were 1,000. Product B requires 400 machine setups and machine hours used on it were 500. Product C requires 620 machine setups and machine hours used on it were 1,500. The company has defined an activity cost pool machine setups for which the cost driver is number of machine setups. The total overhead cost assigned to that cost pool was Rs.183,000. The machine setups overhead assigned to each of the products was:

   a) Rs.61,000 for A; Rs.61,000 for B; Rs.61,000 for C

   b) Rs.61,000 for A; Rs.30,500 for B; Rs.91,500 for C

   c) Rs.30,000 for A; Rs.60,000 for B; Rs.93,000 for C

   d) Rs.30,000 for A; Rs.63,000 for B; Rs.90,000 for C

10. L Company produces two products- calculators and games. The company planned to produce 4,000 calculators and 8,000 games. The company uses ABC costing, and one of the activity cost pools was assembly, which had a cost driver of total parts. The total amount of estimated overhead for the assembly cost pool was Rs.748,000. The calculator required 16 parts, and the games required 52 parts. What would the overhead cost per unit be as it relates to the assembly cost pool for games?

    a) Rs.44.00

    b) Rs.62.33

    c) Rs.71.50

    d) Rs.82.00

Theoretical Questions:

1. Define the following terms
   a. Cost Driver
   b. Activity cost pool
2. What is Activity Based Costing? How are product costs determined in ABC
3. What are the benefits of ABC
4. What are the limitations of ABC
5. Describe various level of activities under ABC

Self Examination Question

Q.1 A Company manufactures three products namely A,B, C in a factory. The following cost data for the month of March,2023 are as under

Activity	**A**	**B**	**C**
Unit Produced	10,000	15,000	20,000
Direct labour hrs per unit	3	4.5	4
Machine hrs per unit	6	4	5
Set-up of machines	20	25	30
Number of Orders	15	12	10
Machine operating cost (Rs.)			34,50,000
Machine set-up cost (Rs.)			4,36,000
Oreder Processing Cost (Rs.)			2,56,000

Required:

i) Identify cost pool, cost drivers

ii) Calculate cost driver rate

iii) Calculate overheads rate per unit using ABC

Q.2 XYZ pens Ltd. Manufactures two products- "Gel Pen" and " Ball Pen". It furnishes the following data for the year 2023

Product	**Annual Output**	**Total Machine Hrs**	**Total No. of Purchase Order**	**Total No. of Set-ups**
Gel Pen	5,500	24,000	240	30
Ball Pen	24,000	54,000	448	56

Annual overheads are as under:

Particulars	**Amount (Rs.)**
Volume related activity costs	4,75,020
Set up related cost	5,79,988
Purchase related cost	5,04,992

Calculate the overhead cost per unit of each product on the basis of :

i) Traditional method of charging overheads

ii) Activity Based Cosing Method

iii) Find out difference in cost per unit between both the method.

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