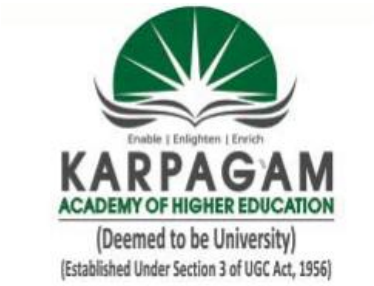

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University Established Under Section 3 of UGC Act 1956)

Coimbatore – 641 021.

Semester IV

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16CCU401 **COST ACCOUNTING**

COURSE OBJECTIVES:

- To familiarize the students about financial planning and management.
- To acquaint the students about the various aspects of capital structure.
- To improve the knowledge of the students about the Dividend policies followed by various organizations.

LEARNING OUTCOME:

- To acquaint the students with basic concepts used in cost accounting, various methods involved in cost ascertainment and cost accounting book keeping systems.

UNIT-I

Introduction : Meaning, objectives and advantages of cost accounting; Difference between cost accounting and financial accounting; Cost concepts and classifications; Elements of cost; Installation of a costing system; Role of a cost accountant in an organization- Preparation of Cost Sheet

UNIT- II

Elements of Cost: Materials: Material/inventory control techniques. Accounting and control of purchases, storage and issue of materials. Methods of pricing of materials issues — FIFO, LIFO, Simple Average, Weighted Average, Replacement, Standard Cost. Treatment of Material Losses.

UNIT-III

Labour: Accounting and Control of labour cost. Time keeping and time booking. Concept and treatment of idle time, over time, labour turnover and fringe benefits. Methods of wage payment and the Incentive schemes- Halsey, Rowan, Taylor's Differential piece wage.

UNIT- IV

Elements of Cost: Classification, allocation, apportionment and absorption of overheads; Under- and over-absorption; Capacity Levels and Costs; Treatments of certain items in costing like interest on capital, packing expenses, bad debts, research and development expenses; Activity based cost allocation.

UNIT- V

Methods of Costing: Unit costing, Job costing, Contract costing, Process costing (process losses, valuation of work in progress, joint and by-products), Service costing (only transport).

Suggested Readings:

Text Books

1. **S.P. Jain and KL. Narang**. (2013) *Cost Accounting* New Delhi, Kalyani Publishers.

Reference Books

1. Jawahar Lal (2013). *Cost Accounting* [5th Edition]. New Delhi, Tata McGraw Hill
2. Arora, M.N(2009). *Cost Accounting Principles and Practice* [10th Ed]. New Delhi, Vikas Publishing House.
3. Maheshwari, S.N. and S.N. Mittal. (2013). *Cost Accounting: Theory and Problems* New Delhi, Shri Mahavir Book Depot,., ,
4. Iyengar, S.P.(2013) *Cost Accounting*. [10th edition]. New Delhi, Sultan Chand & Sons

KARPAGAM ACADEMY OF HIGHER EDUCATION

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Coimbatore – 641 021.

LECTURE PLAN

DEPARTMENT OF COMMERCE

STAFF NAME: PADMA PRIYA AND NAVEENA.R

SUBJECT NAME: COST ACCOUNTING SUB.CODE:16CCU401

SEMESTER: IV CLASS: II B.COM CA

UNIT 1

S. No	Lecture Duration (hour)	Topics to be Covered	Support Material/Page Nos
1	1	Introduction of cost accounting -Definition of cost	T1: I-1 - 2
2	1	An overview of costing and cost accounting	T1:I-1 - 3
3	1	Objectives of costing Scope of cost accounting	T1: I-4 – 5,R1: I- 5
4	1	Advantage and disadvantage of cost accounting.	T1: I-6
5	1	Relationship of Cost Accounting with Financial Accounting and Management Accounting	T1: I-10
6	1	Types and Methods of cost	R1: 23 - 26
7	1	Cost Analysis: Cost concepts,	T1:I26 - 29
8	1	Classifications of cost	T1:I26 - 29
9	1	Limitations of Cost Accounting	T1: 6 – 7
10	1	Elements of cost	T1:I28 - 29
11	1	Installation of Cost Accounting	T1: I-15
12	1	Role of a Cost Accounting in organization	T1: I-20
13	1	Preparation of cost sheet	T1: I-30-32
14	1	Calculation of stock of Work in progress	T1: I-32-38
15	1	Recapitulation and Important Question Discussion	
Total No. of Hours planned for Unit – I			**15 Hours**

UNIT II

S.No	Lecture Duration (hour)	Topics to be Covered	Support Materials
1	1	Introduction to purchasing of Materials, Needs of Materials,	T1: II 4 - 6
2	1	Procedure and documentation involved in purchasing of Materials	T1: II 4 - 6
3	1	Methods of valuing material issues ❖ Cost Price Method	T1: II 62 - 71
4	1	Market Price Method Standard Price Method	T1: II 71-74
5	1	Methods of pricing- Problems to be worked in FIFO	R1: 111 - 117
6	1	Methods of pricing- Problems to be worked in FIFO	R1: 111 - 117
7	1	Problems to be worked for LIFO method	R1: 111 - 117
8	1	Problems to be worked for LIFO method	R1: 111 - 117
9	1	Simple Average Method - Problems	R1: 163
10	1	Weighted Average Method-Problems	R1: 163
11	1	Standard Cost –Problems	T1: 106 - 115
12	1	Treatment of material losses –Waste, Scrap, Defectives and Spoilage	T1: II – 91-95
13	1	Treatment of material losses - Problems	T1: II – 97-99
14	1	Treatment of material losses - Problems	T1: II – 97-99
15	1	Recapitulation and Important Question Discussion	
Total No. of Hours planned for Unit – II			**15 Hours**

UNIT III

S No.	Lecture Duration (hour)	Topics to be Covered	Support Materials
1	1	Introduction to Labour cost Types of Labour	T1: II -106
2	1	Control Over labour cost; ➢ Personnel Department ➢ Engineering Department ➢ Time and Motion Study Departments	T1:II 107 - 118
3	1	Control Over labour cost; ▪ Time-Keeping Department ▪ Pay-Roll Department ▪ Cost Accounting Department	T1:II 107 - 118
4	1	Control Over labour cost - Problems	T1: II 110
5	1	Time Keeping and time booking	T1: II – 119 - 127
6	1	Concept of Idle time, over time, Labour turnover	T1: II 127 - 139
7	1	Remuneration and Incentive Schemes	T1: II 154 - 156
8	1	Taylor's Different piece rate system	T1: II -156
9	1	Taylor's Different piece rate system – Problems	T1: II -156-157
10	1	Halsey Premium Plan –Advantage and Disadvantage	T1: II – 161
11	1	Halsey Premium Plan- Problems	T1: II – 161
12	1	Rowan Plan–Advantage and Disadvantage	T1: II – 162
13	1	Rowan Plan-Problems	T1: II – 162
14	1	Difference Between Halsey and Rowan Plan	T1:162
15	1	Recapitulation and Important Question Discussion	
Total No. of Hours planned for Unit – III			**15 Hours**

UNIT IV

S.No	Lecture Duration (hour)	Topics to be Covered	Support Materials
1	1	Introduction to Overheads and Classification of Overheads.	T1: II -209
2	1	Allocation and apportionment of overhead expenses	T1: II -211
3	1	Difference between Allocation and apportionment of overhead expenses	T1: II -212
4	1	Absorption: Meaning and Overhead absorption rate	T1: II -218
5	1	Methods of Absorption of Manufacture overheads	T1: II -222-230
6	1	Methods of Absorption –Prime Cost Method, Hour rate Method	T1: II -222-230
7	1	Overhead absorption rate: Problems	T1: II -218 - 230
8	1	Under- Absorption –Problems	T1: II -231
9	1	Over – Absorption: Problems	T1: II -231
10	1	Over – Absorption: Problems	T1: II -231
11	1	Capital Levels & Costs	T1: II -232
12	1	Treatment of interest on capital and packing expenses in costing	T1: II -233
13	1	Treatment of Bad debts and research in costing	T1: II -235
14	1	Development expenses; Activity based cost allocation.	T1: II -236
15	1	Recapitulation and Important Question Discussion	
Total No. of Hours planned for Unit – IV			**15 Hours**

UNIT V

S.No	Lecture Duration (hour)	Topics to be Covered	Support Materials
1	1	Introduction to Methods of Costing.	T1: IV 4
2	1	Unit Costing –Problems	T1: IV 63- 74
3	1	Unit Costing –Problems	T1: IV 63- 74
4	1	Job Costing – Features and Objectives, Advantages, Procedure.	T1: IV 6 - 15
5	1	Job Costing –Problems	T1: IV 6 - 15
6	1	Contract Costing- Features and Types.	T1: IV 19 - 38
7	1	Contract Costing –Problems	T1: IV 19 - 38
8	1	Difference Between job and Process Costing	T1: IV 131-140
9	1	Process Costing –Problems	T1: IV 131-140
10	1	Service Costing –Ascertainment of Cost (Transport)	T1: IV 90-100
11	1	Service Costing –Problems	T1: IV 90-100
12	1	Recapitulation and Important Question Discussion	
13	1	**Revision:** Discussion of Previous Year ESE Question Papers	
14	1	Discussion of Previous Year ESE Question Papers	
15	1	Discussion of Previous Year ESE Question Papers	
Total No. of Hours planned for Unit – V& ESE Question paper discussion			**15 Hrs.**

TEXT BOOK:

T1 : S. P. Jain and K.L. Narang (2016) Cost accounting-Kalyani publishers. Ludhiana.

REFERNECES:

R1 : R. S. N. Pillai and V. Bagavathi (2010) cost accounting New Delhi S.Chand and co.

WEB ADDRESS

W1: http:// en-wikipedia.org/wiki/cost-benefit-analysis

W2: www.yourarticllibrary.com/cost.../labour-turnover-formula

Syllabus:

Introduction : Meaning, objectives and advantages of cost accounting; Difference between cost accounting and financial accounting; Cost concepts and classifications; Elements of cost; Installation of a costing system; Role of a cost accountant in an organization- Preparation of Cost

INTRODUCTION TO COST ACCOUNTING

Cost:

The word cost is used very often in our day –to –day affairs. The committee on terminology, American institute of certified public accountants defined as:

"Cost is the amount, measured in money, of cash expended or other property transferred, capital stock issued, services performed, or liability incurred, in consideration of goods or services received or to be received".

Costing:

It is referred to as classifying, recording and appropriate allocation of expenditure for the determination of the costs of products or services".

Cost Accounting:

The institute of cost and works accountants, India defines" cost accounting is the technique and process of ascertainment of costs. Cost accounting is the process of accounting for costs, which begins with recording of expenses or the bases on which they are calculated and ends with preparation of statistical data".

Uses of Cost, financial and management accounting:

Cost Accounting is a branch of accounting, which has been developed because of the limitations of Financial Accounting from the point of view of management control and internal reporting.

Financial accounting performs admirably, the function of portraying a true and fair overall picture of the results or activities carried on by an enterprise during a period and its financial position at the end of the year.

Also, on the basis of financial accounting, effective control can be exercised on the property and assets of the enterprise to ensure that they are not misused or misappropriated.

To that extent financial accounting helps to assess the overall progress of a concern, its strength and weaknesses by providing the figures relating to several previous years.

Data provided by Cost and Financial Accounting is further used for the management of all processes associated with the efficient acquisition and deployment of short, medium and long term financial resources.

Such a process of management is known as Financial Management. The objective of Financial Management is to maximize the wealth of shareholders by taking effective Investment, Financing and Dividend decisions. Investment decisions relate to the effective deployment of scarce resources in terms of funds while the Financing decisions are concerned with acquiring optimum finance for attaining financial objectives.

The last and very important 'Dividend decision' relates to the determination of the amount and frequency of cash which can be paid out of profits to shareholders.

On the other hand, Management Accounting refers to managerial processes and technologies that are focused on adding value to organizations by attaining the effective use of resources, in dynamic and competitive contexts.

Hence, Management Accounting is a distinctive form of resource management which facilitates management's 'decision making' by producing information for managers within an organization.

SCOPE OF COST ACCOUNTING

The terms ‘costing’ and ‘cost accounting’ are many times used interchangeably. However, the scope of cost accounting is broader than that of costing. Following functional activities are included in the scope of cost accounting:

1. **Cost book-keeping*:*** It involves maintaining complete record of all costs incurred from their incurrence to their charge to departments, products and services. Such recording is preferably done on the basis of double entry system.

2*. Cost system*: Systems and procedures are devised for proper accounting for costs.

3. Cost ascertainment*:* Ascertaining cost of products, processes, jobs, services, etc., is the important function of cost accounting. Cost ascertainment becomes the basis of managerial decision making such as pricing, planning and control.

4. Cost Analysis*:* It involves the process of finding out the causal factors of actual costs varying from the budgeted costs and fixation of responsibility for cost increases.

5. Cost comparisons*:* Cost accounting also includes comparisons between cost from alternative courses of action such as use of technology for production, cost of making different products and activities, and cost of same product/ service over a period of time.

6. Cost Control*:* Cost accounting is the utilization of cost information for exercising control. It involves a detailed examination of each cost in the light of benefit derived from the incurrence of the cost. Thus, we can state that cost is analyzed to know whether the current level of costs is satisfactory in the light of standards set in advance.

7. Cost Reports*:* Presentation of cost is the ultimate function of cost accounting. These reports are primarily for use by the management at different levels. Cost Reports form the basis for planning and control, performance appraisal and managerial decision making.

OBJECTIVES OF COST ACCOUNTING

There is a relationship among information needs of management, cost accounting objectives, and techniques and tools used for analysis in cost accounting. Cost accounting has the following main objectives to serve:

1. Determining selling price

The objective of determining the cost of products is of main importance in cost accounting. The total product cost and cost per unit of product are important in deciding selling price of product. Cost accounting provides information regarding the cost to make and sell product or services. Other factors such as the quality of product, the condition of the market, the area of distribution, the quantity which can be supplied etc., are also to be given consideration by the management before deciding the selling price, but the cost of product plays a major role.

2. Controlling cost

Cost accounting helps in attaining aim of controlling cost by using various techniques such as Budgetary Control, Standard costing, and inventory control. Each item of cost [viz. material, labour, and expense] is budgeted at the beginning of the period and actual expenses incurred are compared with the budget. This increases the efficiency of the enterprise.

3. Providing information for decision-making

Cost accounting helps the management in providing information for managerial decisions for formulating operative policies. These policies relate to the following matters:

(i) Determination of cost-volume-profit relationship.

(ii) Make or buy a component

(iii)Shut down or continue operation at a loss

(iv)Continuing with the existing machinery or replacing them by improved and economical machines.

4. Ascertaining costing profit

Cost accounting helps in ascertaining the costing profit or loss of any activity on an objective basis by matching cost with the revenue of the activity.

5. Facilitating preparation of financial and other statements

Cost accounting helps to produce statements at short intervals as the management may require. The financial statements are prepared generally once a year or half year to meet the needs of the management. In order to operate the business at high efficiency, it is essential for management to have a review of production, sales and operating results. Cost accounting provides daily, weekly or monthly statements of units produced, accumulated cost with analysis. Cost accounting system provides immediate information regarding stock of raw material, semi-finished and finished goods. This helps in preparation of financial statements.

Some other Objectives of Cost accounting are as follows:

- To ascertain the cost per unit of the different products manufactured by the business concern.

- To provide a correct analysis of cost both by process or operations and by different elements of cost.
- To disclose sources of wastage whether of material, time or expense or in the use of machinery equipment & tools.
- To provide requisite data & serve as a guide to price fixing of products manufactured or services rendered.
- To ascertain the profitability for advising the management.
- To exercise effective control of stock, raw materials, working progress & finished products.
- To reveal the sources of economy.
- To help in supervising.
- To organize the internal systems, Cost reduction programs.
- To provide specialized services of cost audit.
- To find out costing Profit or Loss.

Advantages of cost accounting:

1. To the management
   - i) Action against unprofitable activities
   - ii) Facilitates decision making
   - iii) Assistant in fixing prices
   - iv) Facilitates cost control
   - v) Establishes standard cost
   - vi) Improves efficiency
   - vii) Inventory control
   - viii) Prevents fraud
   - ix) Tool of management control

X) Measuring rods

xi) Future prospects

xii) Budgeting

2. To the employees

i) Sound wage policy

ii) Higher bonus plan

iii) Distinction between efficient and inefficient workers

iv) Security of job

3. To the creditors
4. To the government
5. To the public

Limitations of cost accounting:

- It lacks a uniform procedure.
- Many formalities are to be observed.
- Handling future situations has not been much.
- It is very expensive.
- It is failure in many cases.

Merits of Cost Accounting

1. Helpful in Planning and Decision Making:

- Cost information brings to light the profitable activities of the organisation.
- It provided the sound and rational basis for planning, the changes in products, plants, processes and techniques of production.
- The information provided by cost accounting is also useful in evaluating the various alternatives involved in a situation before taking any final decision.

2. Inventory Control:

- As an efficient stores accounting system is essential to an adequate system of cost accounts, in effective check is provided on all materials and stores.

3. Ascertainment of Costs:

- Cost accounting is very helpful in calculating the cost of an article being produced by the enterprise.
- It helps in fixing the selling price of the product.

4. Standard Costs:

- It helps the production manger not only to find what various jobs and processes have cost but also what they should have cost.
- The pre-planned standard costs are used for comparison of the cost of the products.

5. Assistance in Manufacturing:

- Cost accounting pinpoints lapses in purchases of raw materials and other articles, their utilization.
- It indicates where wastages are occurring long before the production is finished. It helps to take immediate steps to avoid such losses and wastes.

6. Promotion of Sales:

- Cost accounting is also very helpful in the promotion of sales by adopting an appropriate price policy.
- The technique of break even analysis serves as constant remembers to increase the sales to the break even point.
- It also seeks to control the selling and distribution coasts.

7. Evaluation of Profitability:

- It helps in elimination unprofitable activities and operations.

8. Profit can be maximized:

- Cost accounting helps the management in maximizing profits by eliminating all wastes and uneconomical processes. This cost accounts help in increasing points and minimizing loses.

Relationship of cost and financial accounting

S. No.	Basis	Financial accounting	Cost accounting
1	Distinction period/amount	Transaction is recorded for a definite period.	Transaction is identified with cost units.
2	Purpose	Prepared to show the final results during a particular period to owners, outsiders etc.	It aims to guide the management for proper planning, control and decision making.
3	Analysis of expenditure	It analyses the expenditure under different types of expenses, e.g. wages, salaries, depreciation etc.	It analyses the expenditure under different types of performance as distinct from types of expenses e.g. direct labor, indirect labor, direct materials, etc.
4	Material control	It does not tell us the inefficiencies of material handling, as the figures are available in aggregate.	It provides the system of good inventory control through a prescribed procedure for purchases, storage, issue etc.
5	Nature	It is positive science	It is positive as well as normative science
6	Wastages	There are no such categories	Wastages, shortages, losses etc are categorized into normal and abnormal and aim to eliminate losses.
7	Dealings	It deals with actual facts and figures	It deals partly with actual facts and figures and partly with

			estimates.
8	Transactions	It deals with external transactions	It deals with internal transactions
9	Classifications	It makes no distinction between controllable and uncontrollable or fixed and variable costs.	It makes clear distinction between controllable and uncontrollable or fixed and variable costs.
10	Legal requirements	They are kept as required by companied act, income tax act.	These accounts are kept generally to meet the requirement of the management. Now it, is obligatory to keep such records.

The difference between management and cost accounting are as follows:

S.No.	Cost Accounting	Management Accounting
1	The main objective of cost accounting is to assist the management in cost control and decision-making.	The primary objective of management accounting is to provide necessary information to the management in the process of its planning, controlling, and performance evaluation, and decision-making.
2	Cost accounting system uses quantitative cost data that can be measured in monitory terms.	Management accounting uses both quantitative and qualitative data. It also uses those data that cannot be measured

		in terms of money.
3	Determination of cost and cost control are the primary roles of cost accounting.	Efficient and effective performance of a concern is the primary role of management accounting.
4	Success of cost accounting does not depend upon management accounting system.	Success of management accounting depends on sound financial accounting system and cost accounting systems of a concern.
5	Cost-related data as obtained from financial accounting is the base of cost accounting.	Management accounting is based on the data as received from financial accounting and cost accounting.
6	Provides future cost-related decisions based on the historical cost information.	Provides historical and predictive information for future decision-making.
7	Cost accounting reports are useful to the management as well as the shareholders and creditors of a concern.	Management accounting prepares reports exclusively meant for the management.
8	Only cost accounting principles are used in it.	Principals of cost accounting and financial accounting are used in management accounting.

9	Statutory audit of cost accounting reports are necessary in some cases, especially big business houses.	No statutory requirement of audit for reports.
10	Cost accounting is restricted to cost-related data.	Management accounting uses financial accounting data as well as cost accounting data.

TECHNICAL METHODS OF COSTING

1. **Historical Costing:**
   - The ascertainment of costs after they have been incurred Historical costs are, therefore, 'postmortem' costs as under this method all the expenses incurred on the production are first incurred and them the costs are ascertained.
2. **Standard Costing:**
   - The preparation and use of standard costs, their comparison with actual costs and the analysis of variance to their causes and points of incidence'.
   - Here the standards are first set and then they are compared with actual performances. The difference between the standard and the actual is known as the variance. The variances are analyzed to find out their causes and also the points or locations at which they occur.
3. **Marginal Costing:**
   - The ascertainment of marginal costs and of the effects on profit of changes in volumes or type of output by differentiating between fixed costs and variable costs'.
   - The fixed costs are those which do not change but remain the same, with the increase or decrease in the quantum of production. The variables costs are those which do change proportionately with the change in quantum of production.

- The marginal costing takes into account only the variable costs to find out 'marginal costs'. The difference between Sales and Marginal costs is known as 'Contribution' and contribution is an aggregate of fixed costs and Profit/Loss. So the fixed costs are deducted from the contribution to find out the profits.
- Marginal costing is a technique to ascertain the effect on profits. Marginal costing is a technique to ascertain the effect on profit by the change in the volume of output or by the change in the type of output.

4. **Direct Costing:**

The practice of charging all direct cost to operations, process or products, leaving all the indirect costs to be written off against profits in the period in which they arise

5. **Absorption Costing**

The practice of charging all costs, both variables and fixed, to operations, processes or products.

This is the traditional technique as opposed to Marginal or Direct costing techniques. Here both the fixed and variables cost are charged in the same manner.

METHODS OF COSTING

1. **Job Costing**

It is defined by ICMA, London as that form of specific order costing, which applies where work is undertaken to customer's special requirements.

2. **Contract Costing**

It is applied where the job is big and of no longer duration. For each individual contract, separate accounts have to be kept.

3. **Batch Costing**

A batch may represent a number of small orders in batches through the factory. ICMA defines as "that form of specific order costing, which applies where similar

articles are manufactured in batches either for sale or for use within the undertaking.

4. **Multiple costing**

It means a combination of two or more of the above methods. The system of costing is adopted in manufacturing concerns where a variety of parts are produced separately and later assembled into a final product.

5. **Process Costing**

It applies to industries where production is carried on through different stages before becoming a finished product.

6. **Single output or Unit Costing**

Under this method production is continuous and units are identical. Producing a single article or a few articles, choosing the cost unit depends upon the nature of the product.

7. **Operation Costing**

This method is used where there is a mass production and processes are repetitive in nature, and there is a detailed application of processes costing.

8. **Operating Costing**

It is suitable to those industries which render services instead of producing goods e.g. transport companies, electricity companies, railways, hospitals etc.

9. **Departmental Costing**

It is a method of cost finding adopted to ascertain the cost of operating a department or a cost centre separately.

CLASSIFICATIONS OF COSTS

Costs are classified into following categories:

1. **Classification according to nature or element**

The Term is defined as “the primary classification of costs according to the factors upon which expenditure is incurred i.e. material cost, labor cost and expenses”.

2. Classification according to function of companies

Under this method costs are classified as production cost, administrative cost, selling cost and distribution cost.

3. Classification according to variability

(a) Fixed Cost

It means the cost tends to unaffected with the volume of output.

(b) Variable cost

It means the cost tends to vary directly with the volume of output.

(c) Semi-variable cost

Semi variable costs are those which are partly fixed and partly variable.

4. Classification according to controllability

a) controllable or

b) uncontrollable costs

- Controllable costs

A cost which can be influenced by the action of a specified number of an undertaking is known as controllable cost.

E.g. direct material, direct labor etc.

- Uncontrollable costs

A cost which cannot be influenced by the action of a specified number of an undertaking is known as uncontrollable cost

E.g. rent, rates, taxes, insurance, salary etc.

5. **Classification into direct and indirect costs**

(a) Direct and

(b) Indirect costs

a) Direct costs are those which can be identified with the cost centre or cost unit and can conveniently be connected with any cost unit.

b) Indirect costs cannot be identified with but can be apportioned or absorbed by cost centre's or cost unit.

6. **Classification according to capital and revenue**

a) Capital costs

b) Revenue costs

a) Capital costs are those incurred in the acquisition of assets, either to earn income or increase the earning capacity of the business.

E.g. cost of plant, machinery.

b) Revenue costs are those incurred to maintain earning capacity of the firm.

7. **Classification according to normality costs**

a) Normal costs

b) Abnormal costs

a) Normal costs is a cost which is normally incurred at a given level of output.

b) Abnormal costs are not normally incurred at a given level of output in the conditions in which that level of output is normal.

Cost concepts:

Cost unit

A cost unit is a unit of product, service or time in relation to which cost may be ascertained.

Cost centre

A cost centre is a location, person or item of equipment for which cost may be ascertained and used for the purpose of cost control.

The sub divisions of cost centre are:

1. The personal cost centre
2. Impersonal cost centre
3. Operation cost centre
4. Process cost centre

Profit centre

Profit centre is a segment of a business that is responsible for all activities involved in the production and sales of products, systems and services.

Cost control

Cost control is defined as "the guidance and regulation by executive action of costs of operating an undertaking".

Cost reduction

Cost reduction is concerned with reducing costs. It is concerned with reduction programme which is a continuous process, it strives to achieve permanent reduction, starts where cost control ends. Cost can be reduced on account of savings in cost.

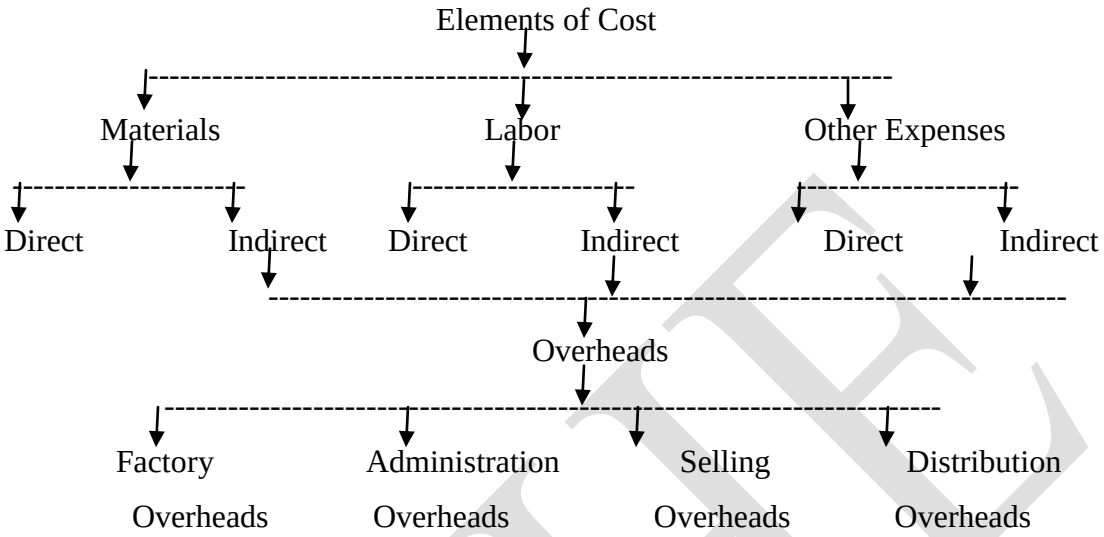
The advantages are:

1. Reasonable price for the customers
2. Continued employment for the workers
3. Increase in productivity
4. Expected return on capital
5. Prosperity of the industry
6. Economic use of resources
7. Increased credit worthiness

Cost audit

"Cost audit is the verification of cost accounts and a check on the adherence to the cost accounting plan".

ELEMENTS OF COST



Cost of production/manufacturing consists of various expenses incurred on Production/ manufacturing of goods or services. These are the elements of cost which can be divided into three groups: Material, Labor and Expenses.

I Material

To produce or manufacture material is required; all material which becomes an integral part of finished product and which can be conveniently assigned to specific physical unit is termed as "Direct Material". It is also described as raw material, process material, prime material, production material, stores material, etc. The substance from which the product is made is known as material. It may be in a raw or manufactured state. Material is classified into two categories:

- **Direct material**

Direct Material is that material which can be easily identified and related with specific product, job, and process. Timber is a raw material for making furniture, cloth for making garments, sugarcane for making sugar, and Gold/ silver for making jewellery, etc are some examples of direct material.

- **Indirect material**

Indirect Material is that material which cannot be easily and conveniently identified and related with a particular product, job, process, and activity. Consumable stores, oil and waste, printing and stationery etc, are some examples of indirect material. Indirect materials are used in the factory, the office, or the selling and distribution department.

II Labor Expenses

Labor is the main factor of production. For conversion of raw material into finished goods, human resource is needed, and such human resource is termed as labor. Labor cost is the main element of cost in a product or service. Labor can be classified into two categories:

- **Direct labor**

Labor which takes active and direct part in the production of a commodity. Direct labor is that labor which can be easily identified and related with specific product, job, process, and activity. Direct labor cost is easily traceable to specific products. Direct labor costs are specially and conveniently traceable to specific products. Direct labor varies directly with the volume of output. Direct labor is also known as process labor, productive labor, operating labor, direct wages, manufacturing wages, etc. Cost of wages paid to carpenter for making furniture, cost of a tailor in producing readymade garments, cost of washer in dry cleaning unit are some examples of direct labor.

- **Indirect labor**

Indirect labor is that labor which can not be easily identified and related with specific product, job, process, and activity. It includes all labor not directly engaged in converting raw material into finished product. It may or may not vary directly with the volume of output. Labor employed for the purpose of carrying out tasks incidental to goods or services provided is indirect labor. Indirect labor is used in the factory, the office, or the selling and distribution department. Wages of store-keepers, time-keepers, salary of works manager, salary of salesmen, etc, are all examples of indirect labor cost.

III Other Expenses

All cost incurred in the production of finished goods other than material cost and labour cost are termed as expenses.

- **Direct expenses**

These are expenses which are directly, easily, and wholly allocated to specific cost center or cost units. All direct cost other than direct material and direct labor are termed as direct expenses. Direct expenses are also termed as chargeable expenses. Some examples of the direct expenses are hire of special machinery, cost of special designs, moulds or patterns, feed paid to architects, surveyors and other consultants, inward carriage and freight charges on special material, Cost of patents and royalties.

1. Cost center means a location, person, or item of equipment or group of these for which costs may be ascertained and used for the purpose of cost control.

2. Cost object is anything for which a separate measurement of cost is desired. It may be a product, service, project, or a customer.

- **Indirect expenses**

These expenses cannot be directly, easily, and wholly allocated to specific cost center or cost units. All indirect costs other than indirect material and indirect labor are termed as indirect expenses. Thus, Indirect Expenses = Indirect cost – Indirect material – Indirect labor. Indirect expenses are treated as part of overheads. Rent, rates and taxes of building, repair, insurance and depreciation on fixed assets, etc, are some examples of indirect expenses.

COST SHEET

Cost Sheets are statements setting out the costs of a product giving details of all the costs. Presentation of costing information depends upon the method of costing. A cost sheet can be prepared weekly, monthly, quarterly or annually.

In a cost sheet besides total expenditure incurred, cost per unit of output in case of each element of cost can be shown in a separate column. The cost sheet should give cost per unit in the previous period for the purposes of comparison

PREPARATION OF COST SHEET

1. Prime Cost = Direct Materials + Direct Labor + Direct Expenses

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

3. Cost of Production =Factory or Works Cost + Administration Overheads

4. Total Cost or Cost of Sales = Cost of Production + Selling and Distribution Overheads

SPECIMEN OF COST SHEET

Particulars	**Cost per unit (Rs.)**	**Total Cost (Rs.)**
Direct materials consumed:		
Opening stock		
Add: purchases		
Less: closing stock		
Cost of drawings		
Direct expenses		
Primary packing materials		
PRIME COST	--------	---------
Add: works/factory overheads:		
Indirect materials		
Indirect wages		
Factory rent and rates		
Factory lighting and heating		
Power and fuel		
Repairs and maintenance		
Drawing office expenses		
Research and experiment cost		
Depreciation of factory plant		
Works stationery		

Insurance of factory		
Works managers salary		
WORKSCOST/FACTORY	--------	----------
COST/MANUFACTURING COST		
Add: office and administrative overheads:		
Office salaries		
Office rent and rates		
Lighting and heating		
Cleaning		
Telephone and postages		
Printing and stationery		
Depreciation of office furniture		
Depreciation of office equipment		
Insurance		
Legal expenses		
COST OF PRODUCTION		
Add: selling and distribution overheads:		
Advertising		
Salesman salaries		
Samples and free gifts		
Sales office rent		
Sales promotion expenses		
Packing and demonstration		
Showroom rent and rates	---------	----------
Repair of delivery vans		

Carriage freight outwards etc. COST OF SALES		

Advantages of Cost Sheet

1. It is a simple and useful medium of communication which gives information about costs to all levels of management in a simple and lucid form.
2. It helps in comparative study of the various elements of costs with the past results and standard cost. Thus it helps the management in control process.
3. It helps the management in fixing up the selling price more accurately.
4. If acts as a guide to the manufacturer and helps him in formulating a definite and profitable production policy.
5. It enables a producer keep a close watch and control over the cost of production.
6. It shows the total cost and the per unit of the units produced during the given period.

Tender or quotation:

It is a kind of contract mostly followed by public companies especially when govt want to construct bridge, road, railways, airways and these kind of activities then govt call the top player in that field and ask them to give their quotation which means the minimum amount that is required to completed that project and the one who quotes the least price get that contract which is called tender.

It is a request to interested parties to send in their quotation for supplying goods or services. Tender system is usually followed in Government purchases, normally when the purchases are of large value, like building an airport etc. the specifications of the goods and services are available in Tender Documents, which the bidder (or the party quoting) can obtain from the tenderer. The documents may or may not be priced.

Tenders also carry the last date or deadline for submission of bids or quotes and also a date when all the quotations received will be opened. The parties quoting are then invited to

participated in the opening. Prior to the opening of the bids, the prices are secret, since the bids are sealed and kept securely.

Usually, the party complying with all or most of the technical requirements and with the lowest price quoted is awarded the contract.

Tender in business means a type of quotation offering lowest prices for supply of some goods or service or job works. Normally, in tender you have to deposit some amount (refundable or non-refundable), whereas it is not compulsory in quotation.

It's a bid for a contract. We tender (give) our estimate, usually in competition with other potential contractors.

Problem 1

The following particulars have been extracted from the costing records of a manufacturing co., for the year ended 30th June, 1991.

	Rs.
Raw material purchase	1,00,000
Wages :	
Direct	60,000
Indirect	10,000
Office Salaries	22,000
Finished Goods stock	10,000
Advertising	6,000
Agent's Commission	10,000
Rent, rates & taxes etc (9/10 for works , 1/10 for office)	2,000
Works	4,000
Building-repairs	2,000
Salaries-plant	4,000
Depreciation	**Rs.**
Plant Machinery	4,000

Building	2,000
Carriage inward	2,000
Carriage Outward	6,000
Sales	4,00,000
Opening Stock-	
Raw material	40,000
Travelling expenses	2,000
Power	2,000
Plant Maintenance	8,000
Miscellaneous expenses	
Plant	2,000
Office	2,000
Closing Stock	
Raw Materials	40,000
Finished goods	6,000

Building is occupied 9/10 by factory and 1/10 by office. Production 20,000 (Units)

You are required to prepare a detailed cost statement showing

i) Materials consumed
ii) Prime cost
iii) Works on cost.
iv) Cost of production
v) Cost of sales and
vi) Profit earned

Solution:

Particular		**Total Cost**		**Cost per unit**
Opening Stock of raw material	40,000			
Add Purchases	1,00,000			
Add Carriage inward	2,000			
	1,42,000			
Less Closing stock or raw materials	40,000			
i) Materials consumed		1,02,000		5.10
Direct labour		60,000		3,00
ii) Prime Cost		1,62,000		8.10
Add: **Factory overheads**				
Indirect Wages	10,000		0.50	
Power	2,000		0.10	
Plant Maintenance	8,000		0.40	
Rent, rates and taxes (9/10)	1,800		0.09	
Misc. Expenses	2,000		0.10	
Repairs – Building (9/10)0.20	1,800		0.20	
Salaries – Plant	4000		0.20	
Depreciation – Plant	4,000		0.09	
-Building (9/10)	1,800	34,000		1.77

iii) Works cost		1,97,400		9.87
Add: Office Overheads				
Office Salaries	22,000		1.10	
Rents, Rates and Taxes (1/10)	200		0.01	
Misc. expenses	4,000		0.20	
Repairs – Building (1/10)	200		0.01	
Depreciation- Building (1/10)	200	26,600	0.01	1.33
iv) Cost of Production		2,24,000		11.20
Add: Opening Stock of finished product		10,000		
		2,34,000		
Less: Closing stock of finished goods		6,000		
Cost of goods sold		2,28,000		
Add: Selling and distribution overheads				
Carriage outwards	6,000			
Travelling expenses	2,000			
Advertising	6,000			
Agent's Commission	10,000	24,000		
Cost of Sales		**2,52,000**		
Add Profit margin		1,48,000		
v) Sales value		4,00,000		

Problem 2

The cost of Sale of Product A is made up as follows:

Materials used in Manufacturing	55000	Direct Expenses	5000
Materials used in Primary packing	10000	Indirect Expenses (factory)	1000
Materials used in selling product	1500	Administration expenses	1250
Materials used in Factory	750	Depreciation of office building & equipments	750
Materials used in office	1250	Dep. On factory buildings	1750
Labour required in Producting	10000	Selling expenses	3500
Labour required for factory supervision	2000	Freight on material purchased	5000
		Advertising	1250

Assuming that all products are manufactured are sold, what should be the selling price to be obtained as a profit of 20% on selling price?

Solution

COST SHEET

STATEMENT OF COST AND PROFIT

Direct material	**Rs.**	**Rs.**
Materials used in manufacturing	55000	100000
Materials used in primary packing	10000	
Freight on material purchased	5000	70000

Direct labour		10000
Direct expenses-factory		5000
Direct expenses-factory		85000
PRIME COST		
Factory overheads	750	
Labour required for factory supervision	2000	
Indirect expenses – factory	1000	
Dept. on factory building	1750	5500
WORKS COST		90500
Administration Overhead		
Materials used in Overhead	1250	
Administration expenses	1250	
Dept. on office building equipment	750	3250
COST OF PRODUCTION		93750
Selling Distribution Overhead		
Materials used in selling the product	1500	
Selling expenses	3500	
Advertising	1250	6250
COST OF SALES		100000
Profit (20% on selling price or 25% on cost)		25000
SELLING PRICE		125000

Problem 3

From the following data prepare a cost & profit statement of Vijay stoves manufacturing company for the year 1990.

Stock of materials as on 1.1.1990	35000	Establishment expense	10000
Stock of materials as on 31.12.1990	49000	Completed stock in hand 1.1.90	-
Purchase of materials	52500	Completed stock in hand 31.12.90	35000
Direct wages	95000		
Factory expenses	17500	Sales	189000

The number of stoves manufacturing during the year 1990 was 1000. The company wants to quote for the contract for the stoves to be quoted are of uniform quality and make similar to those manufacturing in the previous year. But cost of materials has increased 15% and cost of factory labour by 10%. Prepare a statement of net profit to be quoted to give the same percentage of net profit of turnover as was realized during the year 1990 assuming that the cost per unit of O.H. charges will be the same as the previous year.

Solution

COST AND PROFIT STATEMENT OF STOVES 1990			
Particulars		**Amount Rs.**	**Amount Rs.**
Opening Stock of Materials	35000		
Purchase of Materials	52500		
	87500		
Closing stock of Materials	4900		
VOLUME OF MATERIAL CONSUMED		82600	20.65

Direct wages	95000	23.75
PRIME COST	177600	44.40
Factory expenses	17500	4.37
WORK COST	195100	48.77
Establishment expenses	10000	2.50
COST OF PRODUCTION	205100	51.27
Opening completed stock	-	
Cost of production during the prd	205100	
Closing completed stock	35000	
COST OF SALES	170100	
PROFIT	18900	
SELLING PRICE	189000	

STATEMENT SHOWING QUOTATION PRICE FOR 1000 STOVES

Materials consumed	20650	
15% increase	3098	
		23748
Factory wages	23750	
10%a increase	2375	
PRIME COST		26125
Factory expenses		49873
		4370
WORK COST		54243
Establishment expenses		2500
TOTAL COST		56743
(profit 10% of selling price of 1/9 of cost)		6305
SELLING PRICE		63058

Limitations and objections to cost accounting

1. It is expensive
2. It is unnecessary
3. Matter of routine forms and statements
4. Failure of costing system
5. Not applicable to many industries
6. It is not reliable

Costing is an aid to management

1. Planning is thinking in advance i.e. Looking ahead and deciding in advance what to do, how to do it, when to do it and who is to do it. In planning, the management is concerned with laying down objectives and determining the courses of actions to be followed out of the several alternatives available to achieve those objectives.
2. Thus, planning is concerned with future activity and formulates budgets to meet the objectives of the organization. Since management has to make a choice of one course of action out of the several alternative courses of action available, it involves decision-making. All rational decisions are based on accounting information.
3. Decisions may relate to various problems like fixation of price, whether or not price should be reduced for increased level of sales, whether a change in production should be followed, whether or not factory should operate at full capacity, determination of the most profitable levels of production, whether to make or buy a spare part, whether a new product should be discontinued to avoid the present loss and whether or not an investment in a particular asset will be worth while.
4. Controlling is that part of management activity whereby managers compare actual performance against the planned performance, find out the deviations and take remedial steps to remove the deviations.

POSSIBLE QUESTIONS

PART A (ONE MARKS - ONLINE EXAMINATION)

PART B (2 MARKS)

1.Define Cost Accounting
2.Prepare the chart showing Element of Cost?
3.Define costing.
4.What are the roles of cost in organization?
5.Write a short note on indirect cost
6. Explain Prime cost
7. Write a short note on labour
8. What are the methods of costing

PART C (6 MARKS)

1 Define Cost Accounting .How does cost Accounting differs from Management Accounting?

2 Calculate Prime Cost, Factory Cost, Cost of Production, Cost of Sales and Profit from the following particulars:

Particulars	Amount Rs.	Particulars	Amount Rs.
Direct Materials	1,00,000	Depreciation : Factory Plant Office premises	 500 1,250
Direct Wages	30,000	Consumable stores	2,500
Wages of foreman	2,500	Manager's salary	5,000
Electric power	500	Director's fees	1,250
Lighting : Factory Office	1,500 500	Office stationery	500
Store keeper's wages	1,000	Telephone charges	125
Oil and water	500	Postage and Telegram	250
Rent : Factory Office	5,000 2,500	Salesmen's salaries	1,250
Repairs and Renewals : Factory Plant	 3,500	Traveling Expenses	500

Office Premises	500		
Transfer to Reserves	1,000	Advertising	1,250
Discount on shares written off	500	Warehouse charges	500
Dividend	2,000	Sales	1,89,500
		Carriage outward	375
		Income Tax	10,000

3 Explain the advantage and limitations of cost accounting.

4 The following information has been obtained from the records of left-centre corporation for the period from January 1 to June 30, 2006:

	2006 on jan 1	**2006 on june 30**
Cost of raw material	30,000	25,000
Cost of work in progress	12,000	15,000
cost of stock of finished goods	60,000	55,000
Transactions during six months are		
Purchase of raw material	4,50,000	
Administration Overheads	30,000	
Wages paid	2,30,000	
Selling and Distribution Overheads	20,000	
Factory overheads	92,000	
Sales	9,00,000	

Prepare

i) Cost sheet showing: a) material consumed; b) prime cost; c) factory cost incurred and factory cost; and

ii) Income statement in traditional form for the six months showing gross profit and net profit.

5 Explain the advantage and limitations of cost accounting

6 From the following details, you are required to prepare a Statement of Cost and Profit:

Particulars		Amount Rs.
Opening Stock	(1) Materials	1,00,000
	(2) Work – in – Progress	30,000
	(3) Finished Goods	2,500
Closing Stock	(1) Materials	90,000
	(2) Work – in – Progress	25,000
	(3) Finished Goods	7,500
Material Purchased		2,50,000
Direct Wages		75,000
Manufacturing Expenses		50,000
Sales		4,00,000
Selling and Distribution Expenses		10,000

7 Describe briefly the principal aims of classifying the costs.

Syllabus:

Elements of Cost: Materials: Material/inventory control techniques. Accounting and control of purchases, storage and issue of materials. Methods of pricing of materials issues — FIFO, LIFO, Simple Average, Weighted Average, Replacement, Standard Cost. Treatment of Material Losses.

Meaning of Material

Materials cost is one of the important elements of cost of product or unit. It constitutes a substantial proportion of the total cost of production. For material cost control purposes, it is very essential to know the important aspects of material, material control and material purchase control.

Materials:

The term 'materials' refers to all commodities or components which are consumed in the process of manufacture. The materials may be classified into Direct Materials and Indirect Materials.

Direct Materials:

Direct Materials form part of the finished products. They can be easily identified with a particular cost unit. For example, cotton used in textile mills, timber used in furniture industries.

Indirect Materials:

Indirect materials indirectly used for conversion from raw materials into finished products. They cannot be easily identified with a particular cost unit. For example, spare parts, tools, nails, lubrications etc.

Materials are further classified on the basis of the nature which have to be used such as:

(a) Raw Materials, e.g., rubber, timber, steel etc.

(b) Components, e.g., instruments

(c) Consumable stores, e.g., cotton waste, brushes

(d) Maintenance Materials, e.g., spare parts

(e) Tools, e.g., jigs and fixtures

Materials Control

Materials control may be defined as the systematic control over the procurement, storage and usage of materials so as to maintain an even flow of materials and at the same time avoiding excessive investment in inventories.

From the above definition we can derive the following important aspects:

(1) To ensure the smooth flow of production without interruptions.

(2) Prevention of excessive investments in materials stock.

Functions of Materials Control

The following are the important functions involved in materials control in order to achieve the objectives of the stores department :

(1) Purchasing of Materials

(2) Receiving of Materials

(3) Inspection of Materials

(4) Storage of Materials

(5) Issue of Materials

(6) Maintenance of Stores Records

(7) Stock Audit.

Objectives of Stores Control

The following are the objectives of stores control :

(1) To receive materials and store them properly.

(2) To ensure proper production and preservation of materials.

(3) To make sure proper classification and codification of materials.

(4) To provide proper information to the management about stock of materials.

(5) To ensure good housekeeping and effective material handlings.

(6) To assist in verification and provision of supporting information for effective purchase action.

(7) To minimize obsolescence of materials adopted through effective control measures.

(8) To ensure the optimum investment in materials to avoid overstocking or under stocking of materials.

(9) To maintain proper records about materials, receipts, issues and balances.

(10) To issue materials as per specifications.

(11) To make sure of the availability of all types of materials.

(12) To ensure proper utilization of floor space.

Essentials of Material Control

Effective materials control is required for the following essesentials to be considered:

(1) Systematic planning for requirement of materials.

(2) Essentials for co-ordination and co-operation among different departments.

(3) Fixing of stock level is essential for avoiding overstocking.

(4) Floor space is required for smooth handling of materials.

(5) Proper filing system should be adopted.

(6) Proper codification and classification of materials as per specifications.

(7) Perpetual inventory system should be adopted for verification of materials in stock.

(8) Proper planned storage control and issue.

(9) Systematic procedure should be adopted for materials, receipts and issues.

(10) Qualified personnel required to manage the materials functions effectively.

(11) Appropriate system of internal auditing should be adopted.

Advantages of Materials Control

The following are the advantages of materials control :

(1) It ensures continuous flow of production.

(2) There is maximum utilization of stores resources.

(3) It facilitates economy of buying.

(4) It ensures optimum investments in inventories.

(5) There is possibility of reduction of loss of theft, leakage, obsolescence etc.

(6) It minimizes cost of materials during purchase, storage and issue of materials.

(7) It facilitates effective information.

Economic Order Quantity

- This represents the normal quantity to be placed on order when the stock has reached its re-order level.
- Re-ordering quantity is to be fixed taking into account the maximum and minimum stock levels. The quantity ordered must be that which, when added to the minimum stock, will not exceed the maximum stock to be carried at any point of time.

The following factors govern the re-ordering quantity.

1. Average consumption
2. Cost of pacing order
3. Cost of storage
4. Interest on capital etc.,

Carrying cost of inventory consists of

i) The costs of physical storage, such as cost of space, handling and upkeep expenses, insurance, cost of obsolescence etc.

ii) Interest on capital invested (the opportunity cost of the capital blocked up) and

iii) Cost of placing the order each time.

Economic order quantity or economic lot size (if it relates to production) refers to the number ordered in a single purchase or number of units should be manufactured in a single run so that the total costs-ordering or set up costs and inventory carrying costs are at the minimum level.

In other words, it is the quantity that should be ordered at one time so as to minimize the total of

i) Cost of placing orders and receiving the goods, and

ii) Cost of storing the goods as well as interest on the capital invested. The economic order quantity can be determined by the following simple formula.

$$\text{E.O.Q.} = \sqrt{\frac{2AS}{I}} \text{ ; where}$$

EOQ = Economic order quantity or number of units in one lot.

A = Annual usage in units

S = Ordering costs for one order (or set-up costs for one set-up)

I = Inventory carrying costs per unit per year.

This formula is based in three assumptions:

i) Price will remain constant throughout the year and quantity discount is not involved.

ii) Pattern of consumption, variable ordering costs per order and variable inventory carrying charge per unit per annum will remain the same throughout, and

EOQ will be delivered each time the stock balance, excluding safety stock, is just reduced to nil.

A-B-C Analysis

To exercise proper control on stores, it is essential that the store items should be classified according to values so that the most valuable items may be paid greater and due a attention regarding their safety and care, as compared to others. The stores are divided into three categories generally, viz., A, B, and C.

In the ABC system, greatest care and control is to be exercised on the items of 'A' list as any loss or breakage or wastage of any items of this list may prove to be very costly; proper care need be exercised on 'B' list items and comparatively less control is needed for 'C' list items. The rules relating to receipt maintenance issue and writing off stores items should be formed in accordance with the utility and value of the items based on the above categorization.

Advantages:

1) A Strict Control is exercised on the items which represent a high percentage of the material costs.
2) Investment in inventory is reduced to the minimum possible level.
3) Storage cost is reduced as a reasonable quantity of materials, which account for high percentage of value of consumption, will be maintained in the stores.

Perpetual Inventory System

Perpetual Inventory is a system of records maintained by the controlling department, which reflects the physical movement of stocks and their current balance. It aims at devising the system of records by which the receipts and issues of stores may be recorded immediately at the time of each transaction and the balance may be brought out so as to show the up-to-date position.

The records used for perpetual inventory are:

(1) Bin Cards;

(2) Store Ledger Accounts or Stores Record cards;

(3) The forms and documents used for receipt, issue and transfer of materials.

Advantages of Perpetual Inventory system

1. It keeps the record of stocks up to date.
2. The materials are kept within the Minimum and Maximum Limits. Non-observance of the limits fixed is detected.
3. The materials going out of stock are easily detected and purchased at the appropriate time to avoid the risk of closing down.
4. It acts as a moral check on the staff of the stores Department and so the possibilities of loss or theft of materials are minimized.
5. The recording of stocks in Bin cards as well as Store Record cards minimizes the error in entering the receipts and issues of stocks.
6. The discrepancies noted after physical counting are detected and corrective action is taken promptly to avoid future occurrence.
7. The materials getting state or being wasted are detected and placed in right atmosphere.
8. The prompt balancing of closing stocks enables quick preparation of final accounts.
9. The slow moving inventories, obsolete or dormant stocks are brought to the notice of the Purchase Department so that such stocks may purchased future in lesser quantities as required.
10. The availability of correct figures of stocks helps in the insurance of the stocks.

Purchasing Procedure

(1) Bill of Materials.

(2) Purchase Requisition.

(3) Selection of Suppliers.

(4) Purchase Orders.

(5) Goods Received Note.

(6) Inspection of Materials.

(1) Bill of Materials (Specification of Materials):

Bill of Materials is a list of containing all materials required for manufacturing a product. In other words, it is a form which indicates the quantity and quality and other specifications of materials required for a particular job or process or operation. This is a form sent to the purchase department for asking to purchase the said materials required for a particular work order. At least five copies of bill of materials are prepared by materials requiring department. Out of these copies one copy is sent to purchase department, to the stores, to the production section, to the cost office and to the office copy for further reference.

(2) Purchase Requisition:

It is a form which indicates indent for materials. In any industry, the purchase department places orders for materials based on the purchase requisition form. Usually the purchase requisition form is initiated by the storekeeper for the standard items, the stock which require restocking again and again. Sometimes, it is initiated by other departments for special materials which are not stocked in stores. Whenever any special material is required for production, the purchase requisition form is prepared in three copies. Out of these copies one copy is sent to purchase department, one to the production control department and one to the initiating department.

(3) Selection of Suppliers:

On receipt of the purchase requisition, the purchasing department prepares a list of suppliers who deals with the business of the materials to be purchased and are reliable. It is useful for the purchasing department to call for quotations. If the material to be purchased is of

small Materials Cost Control quantities and is required urgently, it may be purchased locally. After receiving the quotations, prepare a comparative statement of the rates, terms and conditions mentioned in the tenders. If required samples may be received from the suppliers who have quoted the lowest rates. After satisfying the above, select the suitable suppliers to place the purchase order for required materials.

(4) Purchase Order:

Purchase order is a letter which is sent to the suppliers for asking to supply the specified materials. Purchase order must contain the rates, terms, quantity, quality, time of delivery and other conditions mentioned therein. At least five copies of purchase order are prepared by the purchase section and each copy sent to :

(1) Original to the Suppliers.

(2) Storekeeping Department.

(3) Account Section.

(4) Inspection Department.

(5) Retained in the purchase department for further reference.

(5) Goods Received Note:

The materials receiving section is responsible to receive the goods and verify the contents of the packages along with Goods Received Note sent by the suppliers. This section should ensure that the goods have been received as per the purchase order and record the same in the Consignment Note. Five copies of the materials received report are generally prepared. Out of these copies, the original is sent to purchasing department and remaining each copy sent to Stores department, Inspection, Accounts department and one copy retained by it for future reference.

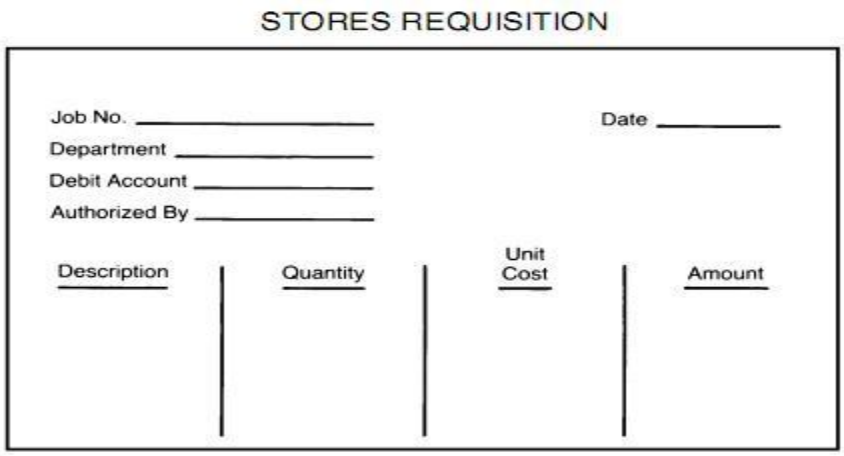
(**6) Inspections of Materials**:

A detailed inspection is carried out after the materials are received. The Inspection Section should ensure that the goods have been received according to purchase order specification. Return of materials to suppliers, if any, damaged, spoiled, excess or not in

accordance with orders. If the materials are found to be satisfactory the bill of the suppliers is passed and the payment is made to the suppliers.

Stores Requisitions

Forms used to keep track of materials charged to a particular job or department. The form contains such items as job number, department, and description of the material, quantity, unit cost, and dollar amount.



Factors to be contributed to purchase control:

i) **Determination of Quantity to be purchased**

- Quantities purchased in excessive number or weight block the working capital and the quantities purchased below the reasonable limit endanger the continuous working of the factory.

ii) **Determination of the Ordering Point**

- The ordering point of the ordering level is one at which the order for purchase of materials is to be placed with the suppliers when the stock of that material is reduced to that point by consumption or otherwise.

iii) **Determination of Price at which to be purchased**

- The selection of right suppliers and the best terms available out of the quotations received helps this factor.

The Purchase cycle constitutes the following:

1. Initiating the purchase;
2. Receiving of the Purchase Requisitions;
3. Deciding important factors relating to purchase;
4. Selecting the suppliers;
5. Placing purchase-orders and follow-up
6. Receiving the supply and returning unwarranted suppliers;
7. Inspecting the material received; and
8. Passing invoices for payment.

The important factors to be decided are:

a) What to purchase;
b) When to purchase; and
c) How much to purchase.

STORES RECORDS

1. **Bin Card**
   - A Bin card, also known as Bin Tag or Stock card, is a card showing quantitative record of the receipts, issues and closing balances of the material kept in the corresponding bin.
   - The Bin card is placed in the bin or shelf or is hung over the almirah or the rack otherwise known as 'Bin'.
   - Separate Bin cards are prepared for each item of stores and if two different materials are kept in one almirah, two Bin cards, one for each, are prepared, treating the almirah as two bins.
2. **Stores Ledger**
   - Stores Ledger is a record of stores, both in quantity and value and is maintained by the stores Accountant.
   - It is similar to Bin card but with the main difference that value of material is shown in

the Stores ledger.

- Stores Ledger is an important book and the account of each item of stores is maintained separately.
- While Bin cards are maintained by store-keeper in the store, Store Ledger is maintained in the accounting department by the Stores Accountant.

Material Control and its Requirements

"Material Control' may be defined as the regulation of the procedures for requisitioning, buying, receiving, storing, handling and usage of materials".

The main requirements of a system of material control are:

- Planning and fixation of definite responsibility for each function of material.
- Co-ordination between departments responsible for requisitioning, purchasing, receiving, inspecting, storing and utilizing the materials,
- Centralization on purchases.
- Use of material purchase budget and material requirement budget.
- Use of standard and uniform forms, and
- Proper system of stock control.

For proper application of the material control the following steps are necessary.

1. Purchasing of materials
2. Receiving and inspecting of materials
3. Storing of materials
4. Pricing material Issues
5. Accounting materials losses.
6. Keeping physical and perpetual inventory

Purchasing of Materials

- In a large manufacturing concern, a separate purchase department is set up with the object of affecting all purchases.
- The top management lays down the purchase department.

- It is the function of the purchaser department to decide:

  i) What to purchaser;

  ii) When to purchase;

  iii) form where to purchase;

  iv) how much to purchase, and

  v) finally at what price the material should be purchased.

Maintenance of Stock Levels

- The next important point after determination of EOQ is to decide as to when the order for purchase should be placed.
- The answer is simple. The order for purchase should be placed when the stock is reduced by usage to the Order Point.
- The Order Point is one where the order should be placed for the economic order quantity.
- For deciding Order Point, two things, viz.,

  (1) Lead time and

  (2) Usage during Lead time, are the determining factors.
- Lead time is the supply time, or to be more specific, Lead Time is "the time interval between placing an order and having materials on the factory floor ready for production…"
- Usage means the sue of materials by consumptions for productions, or the stock of finished goods sold.
- Sometimes purchase are made in large bulk in a season if the goods are seasonal, i.e., available in one season only, or at a time when it is feared that the goods may not be found available in the near future due to some reason.
- Special items for which no limit or order-points are fixed may be purchased as and when needed.
- To avoid over-stocking and under stocking each items of the inventory has the Maximum Level. Minimum Level and an Order point.

Order Point

It is also known; 'Ordering Level'; or 'Reorder Point', or 'Reordering Level or 'Ordering Limit', it has been stated earlier that Order Point is at which order for supply of materials or goods is placed. To decide the Order Point, three factors are considered, viz.,

(1) Lead time

(2) Usage during Lead time, and

(3) Minimum Limit, or the Safety stock.

In order to ensure that the optimum quantity of material is purchased and stocked, neither less nor more, the storekeeper applies scientific techniques of materials management.

Fixing of certain levels for each item of materials is one of such techniques.

The following levels are generally fixed.

1. Maximum level 2. Minimum level
3. Order level 4. Danger level

1. **Maximum level**
   - The maximum stock level indicates the maximum quantity of an item of material which can be held in stock at any time.
   - The maximum stock can be calculated by applying the following formula.
   - Maximum level – Re-order level + re-order quantity – (minimum consumption X minimum re-order period)
2. **Minimum level**
   - Minimum level represents the quantity below which the inventory of any items should not allowed to fall;
   - In other words, an enterprise must maintain minimum quantity of stock so that the production is not hampered due to non-availability of materials.
   - If some buffer inventory is acting as a cushion against reasonable expected maximum usage.

Formula:

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

3. **Re-ordering Level Point**
   - Re-ordering stock level in relation to an items of stock is the point at which it becomes essential to initiate purchase orders for its fresh supplies.
   - Normally, re-ordering level is a point between the maximum and the minimum levels.
   - Fresh orders must be placed before the actual stocks touch the minimum level.

Formula:

Reorder level = maximum re-order period x maximum usage.

4. **Danger level**
   - The danger level is below the minimum level and represents a stage where immediate steps are taken for getting stock replenished.
   - When the stock reaches danger level it is indicative that if no emergency steps are taken to restock the material, the stores will be completely exhausted and normal production stopped.
   - Generally the danger level of stock is fixed above the minimum level but below the re-ordering level.

CONTROL OVER WASTAGE, SCRAP AND SPOILAGE:

Material Losses

1. **Waste:** Waste is defined as discarded substances having no value.
   - ❖ **Normal Waste:** It is the loss which is unavoidable on account inherent nature of material. Some materials such as liquid materials lose their weight due to evaporation. Similarly, there are some materials (i.e. coal) which are wasted due to loading and unloading.

Example:

	Units	Amount
Suppose, total cost of input(i.e. material, labour & o/h)	2,000	20,000
Less: Normal waste @ 5% (assumed)	100	-
Cost of normal output	1,900	20,000

Therefore, cost per unit = $\frac{20,000}{1,900}$ = Rs. 10.53

- **Abnormal Waste:** Any loss caused by unexpected or abnormal conditions such as sub-standard materials, carelessness, accident etc. or loss in excess of the margin anticipated for normal process loss should be regarded as abnormal waste.

  The value of abnormal loss is calculated with the help of the following formula

$$\text{Abnormal Waste} = \frac{\text{Normal cost of normal output}}{\text{Normal output}} \times \text{Units of abnormal Waste}$$

1. **Scrap**

Scrap is discarded material having some value. It represents fragments or remnants of material that are left from certain type of manufacture. It is a material loss but has small value without further processing. Example of scrap are available in operations like turning, boring, punching, sawing, shavings, moldings, etc. from metals on which machine operations are carried out; saw dust and trimmings in the timber industry; dead heads and bottom ends in foundries; and cuttings, pieces and splits in leather industry.

2. **Defectives**

Defective products or units are those which do not meet with dimensional or quality standards and reworked for rectification of defects by application of material, labour and /or processing and salvaged to the point of either standard product or sub-standard product to be sold as seconds. So defectives are that portion which can be rectified at some extra cost of re-operation. Defectives may arise due to the following reasons:

1. Sub-standard materials
2. Poor workmanship
3. Poor maintenance of machines
4. Wrong tool setting
5. Faulty design of products
6. Bad supervision
7. Careless inspection
8. Poor working conditions
9. Lack of Control, such as humidity, furnace temperature etc
10. Excessive short runs.

3. **Spoilage**

Spoilage refers to production that does not meet with dimensional or quality standards in such a way that it cannot be rectified economically and is junked and sold for a disposal value. So it occurs when goods are so damaged in course of manufacturing process as to become not rectifiable with some additional cost. Material used in spoiled units can be used again as material by the same or another process or product. Spoilage cost is the difference between the costs incurred upon the point of rejection less salvage value or cost of material used.

Need for Inventory Control

The term 'Inventory' is used to denote

(i) goods awaiting sale (the stock items of a trading concern and the finished stocks of a manufacturer);

(ii) the goods in course of manufacture, known as work-in-progress, and

(iii) goods to be used directly or indirectly in production, i.e., raw materials and supplies.

Objectives of Inventory Control

1. To exercise proper control on the purchases and issues of inventories; proper storing; elimination of wastage; and regulating the proper supplies to works and to customers;
2. Pricing of the inventories on suitable basis;
3. Proper recording, and scientific inventory management
4. To have proper assessment of income through the process of matching appropriate costs against revenues.
5. To maintain inventory of sufficient size for the operations to go on uninterruptedly but the size should match with the optimum financial involvement.

Methods of pricing

There are different methods of pricing materials issue. The various methods used fall under the following main categories:

I. Cost Price Methods

(a) First in First out (FIFO)

(b) Last in First out (LIFO)

(c) Base Stock

II. Average Price Methods

(a) Simple Average.

(b) Weighted Average

III. Notional Price Method

(a) Standard Price.

(b) Inflated Price.

(c) Replacement price.

First in First out Method (FIFO)

Under this method materials are used in the order in which they are received. In other words, materials received first are issued first. This process is repeated throughout.

The price of the earliest consignment is taken first and when that is exhausted, the price of the next consignment is adopted and so on. This method is most suitable for use where the material is slow moving and has comparatively high unit cost This method is also useful in times of falling prices because the issue price of material to the job will be high while the replacement cost of material will be below.

Illustration

Show the Stores Ledger entries for the month of Jan, 2008 as they would appear when using FIFO method:

Jan.1 Purchased 300 units @ Rs.3 per unit

Jan.4 Purchased 600 units @ Rs.4 per unit

Jan.6 Issued 500 units.

Jan. 10 Purchased 700 units @ Rs.4 per unit.

Jan. 15 Issued 800 units.

Jan.20 Purchased 300 units @ Rs.5 per unit.

Jan.23 Issued 100 units.

Ascertain the quantity and value of closing stock as on 31st Jan under FIFO method.

Solution:

Stores ledger Account (FIFO Method)

200 units @ Rs.4 = 800 300 units @ Rs.5 = 1,500 Rs. 2,300

Advantages of FIFO method:

(i) It is simple to understand and easy to calculate.

(ii) FIFO method is based on sound principle that materials are issued in order of purchase. Thus materials received first are issued first.

(iii) The value of closing stock will reflect current market price.

(iv) This method is suitable when prices are falling.

(v) This method is also useful if transactions are few and prices of material remain stable.

(vi) Unrealized profit or loss does not arise as materials are issued at actual cost but not on estimate.

(vii) Deterioration and obsolescence can be avoided by exhausting oldest materials at the time of issue.

Disadvantages

This method suffers from the following disadvantages:

(i) The calculation becomes difficult and cumbersome when purchases are made very frequently at different prices.

(ii) Issue price does not reflect current market price and so does cost of production.

(iii) For pricing one requisition, more than one price has often to be taken.

(iv) Cost of production tends to be high during the period of falling prices.

(v) Two similar jobs cannot be compared as the issue price of one lot differs from that of other.

Last in First Out Method: (LIFO)

This method is exactly the opposite of FIFO method. Under this me materials received last are issued first. The price of the material to be issued would the cost price of the last lot of materials purchased.

This method is useful during t period of rising prices because materials will be issued from the latest consignment a price which is closely related to the current price levels. Under this method product' cost is calculated on a basis which approximates to replacement cost.

Advantages of LIFO Method:

The following are the advantages of LIFO method:

(i) This method is very simple to operate and quite useful where transactions are not too many and prices are fairly steady.

(ii) Production is charged at the most recent prices so that it is based on the principle that costing should be related to current price levels.

(iii) During the period of rising prices there is no windfall profit as in case of FIFO method.

(iv) Closing stock will be valued at earlier price and will not, therefore, show unrealized profit.

(v) This method reduces burden of income tax during the period of price rise

Disadvantages

Disadvantages:

This method suffers from the following disadvantages:

(i) Like FIFO system, calculations become complicated and cumbersome when transactions are many with frequent price fluctuations.

(ii) Two similar jobs cannot be compared because of charging different rates of materials to different jobs.

(iii) Under this system, closing stocks are not shown at current market price.

(iv) Sometimes more than one price has to be adopted for pricing a single requisition.

(v) When prices are falling it will lead to low charge to production, whereas materials in the stock purchased at higher rate need adjustment for valuation of closing stock.

(vi) This system of material issue is not accepted by Income Tax Authorities.

Base Stock Price

This is not a distinct method of pricing materials issue. This method is based o^ the principle that a certain minimum quantity of material is always maintained in to ensure continuous production.

This minimum stock is treated as fixed asset and is called as base stock. Since minimum stock is created out of first lot of material purchased, it is always valued at cost price of first lot of materials. The quantity in excess of this base stock is issued at a price similar to FIFO or LIFO method.

This bad stock method operates in conjunction with some other methods like FIFO or LIFO and is called Base Stock - FIFO method or Base Stock - LIFO method. The advantages of FIFO and LIFO are applicable in this method.

Simple Average Price Method

Under this method, materials issued are valued at average price. This is calculated by dividing the total of the price of the materials on the stock from which the material to be priced could be drawn by the number of prices used in that total.

Unit pieces of material in stock Issue Price - Number of purchases.

A new simple average price is to be determined when a fresh receipt is made. The rate is also revised when an earlier consignment is exhausted.

The following example will illustrate this. Suppose, following are three different lots of materials in stock when materials is to be priced:

100 units purchased @ Rs.4.00 200 units purchased @ Rs.5.00 300 units purchased @ Rs.6.00

The simple average price will be = Rs.5.00

Advantages of Simple Average Price Method

The following are the advantages of simple average method:

(1) It is easy to calculate and simple to operate**.**

(2) A particular purchase at higher or lower rate cannot disturb the price to a great extent.

(3) Issue rate remains the same until a fresh purchase is made.

Disadvantages:

(1) It is not a logical method as it takes into account purchase price but not quantity.

(2) The value of closing stock becomes absurd.

(3) The issue price does not relate to the current market price.

Weighted Average Method

Merits

1. This method irons out the wide fluctuations in the prices.
2. With every new issue, a new rate is not calculated.
3. The total value of the material issued does not behave up and down to the total value of the material received, as is the case with Simple Average Method.

Demerits

1. Calculations are tedious. Prices are worked out in decimals to get correct results.
2. A lot of materials purchased at a very high price at one time continues to reflect its effect in the average, for a considerable time after it is exhausted.

1) Show the Store Ledger entries as they would appear when using

i) FIFO

ii) LIFO

iii) Weighted average method

iv) Simple average method

April	1.	Balance	300 units	Rs. 600/-
	2.	Purchase	200 units	Rs. 440/-
	4.	Issued	150 units	
	6.	Purchase	200 units	Rs. 460/-
	11.	Issued	150 units	
	19.	Issued	200 units	
	22.	Purchase	200 units	Rs. 480/-
	27.	Issued	250 units	

Problem 4

The following is the record of receipts and issues a certain material in the factory during a week.

April 1997

1. Opening Balance 50 tonnes @ Rs. 10 per tone.
   Issued 30 tonnes @ Rs. 10 per tones
2. Received 60 tonnes @ Rs. 10.20 per tone.
3. Issued 25 tonnes @ Rs. 10.20 per tone (stock verification reveals loss of tone)
4. Received back from orders 10 tonnes @ Rs. 10.20 per tone
   (Previously issued at Rs. 9.15 per tone)
5. Issued 40 tonnes @ Rs. 10.20 per tone.
6. Received 22 tonnes @ Rs. 10.30 per tone.
7. Issued 38 tonnes @ Rs. 10.30 per tone.

Solution 3

1) **Stores Ledger Account as per FIFO METHOD**

Date	Details	Receipt	Issued	Balance						
		Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
April 1	Balance	300	2/-	600	-	-	-	300	2/-	600
2	Purchase	200	2.20	440	-	-	-	300	2.00	600
								200	2.20	440
4	Issue				150	2.00	300	150	2.00	300
								200	2.20	440
6	Purchase	200	2.30	460				150	2.00	300
								200	2.20	440
								200	2.30	460
11	Issue				150	2.00	300	200	2.20	440
								200	2.30	460
19	Issue				200	2.20	440	200	2.30	460
22	Purchase	200	2.40	480				200	2.30	460
								200	2.40	480
27	Issue				200	2.30	460	150	2.40	360
					50	2.40	120			

Value of Closing Stock : 150 units at the rate of Rs. 2.40 value Rs. 360/-

2) **LIFO METHOD**

Date	Details	Receipt	Issued	Balance						
		Unit	Rate	Amt	Unit	Rate	Amt	Unit	Rate	Amt
April 1	Balance	300	2.00	600	-	-	-	300	2.00	600
2	Purchase	200	2.20	440	-	-	-	300	2.00	600
								200	2.20	440
4	Issue				150	2.20	330	300	2.00	600
								50	2.20	110
6	Purchase	200	2.30	460				300	2.00	600
								50	2.20	110
								200	2.30	460
11	Issue				150	2.30	345	300	2.00	600
								50	2.20	600
								50	2.30	115
19	Issue				50	2.30	115	200	2.00	400
					50	2.20	110			
					100	2.00	200			
22	Purchase	200	2.40	480	-	-	-	200	2.00	400
								200	2.40	480
27	Issue				200	2.40	480	150	2.00	300
					50	2.00	100			

Value of Closing Stock : 150 units @ Rs. 2.00 value is Rs. 300/-

3) **WEIGHTED AVERAGE METHOD**

Date	Details	Receipt	Issued	Balance						
		Unit	Rate	Amt	Unit	Rate	Amt	Unit	Rate	Amt
April 1	Balance	300	2.00	600	-	-	-	300	2.00	600
2	Purchase	200	2.20	440	-	-	-	500	2.08	1040
4	Issue	-	-	-	150	2.08	312	350	2.08	728
6	Purchase	200	2.30	460	-		-	550	2.16	1118
11	Issue	-	-	-	150	2.16	324	400	2.16	864
19	Issue	-	-	-	200	2.16	432	200	2.16	432
22	Purchase	200	2.40	480	-	-	-	400	2.28	912
27	Issue	-	-	-	250	2.28	570	150	2.28	342

Value of Closing Stock : 150 units at the rate of Rs. 2.28 value Rs. 342.00/

4) **SIMPLE AVERAGE METHOD**

Date	Details	Receipt	Issued	Balance						
		Unit	Rate	Amt	Unit	Rate	Amt	Unit	Rate	Amt
April 1	Balance	300	2.00	600	-	-	-	300	2.00	600
2	Purchase	200	2.20	440	-	-	-	500	2.10	1050
4	Issue	-	-	-	150	2.10	315	350	2.10	35
6	Purchase	200	2.30	460	-		-	550	2.17	1193..50
11	Issue	-	-	-	150	2.17	325.50	400	2.17	868
19	Issue	-	-	-	200	2.17	434	200	2.17	434
22	Purchase	200	2.40	480	-	-	-	400	2.23	892
27	Issue	-	-	-	250	2.23	557.50	150	2.23	334.50

Value of Closing Stock : 150 units at the rate of Rs. 2.23 value Rs. 334.50

Solution 2

Stores Ledger Account Under LIFO

Date	Receipts		Issues	Balance					
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
1				30			50	10	500
1				30	10	300	20	10	200
2	60	10.20	612	-	-	-	20	10	200
							60	10.20	612
3	-	-	-	25	10.20	255	20	10	200
				1	10.20	10.20	35	10.20	357
							20	10	200
4	10	9.15	91.5				34	10.20	346.80
				-	-	-	20	10	200
							34	10.20	346.80
							10	9.15	91.50
5	-	-	-	10	9.15	31.50	20	10	200
				3	10.20	306.0	4	10.20	40.80
6	22	10.30	226.6				20	10	200
							4	10.20	40.80
7	-	-	-	22	10.30	226.6			
				4	10.20	40.80	8	10.00	80.00
				12	10.00	120.0			

Closing Stock 8 tonnes @ Rs. 10 = Rs. 80/-

Stores Ledger Under FIFO

Date	Receipts	Issues	Balance						
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
1				30			50	10	500
1				30	10	300	20	10	200
2	60	10.20	612	-	-	-	20	10	200
							60	10.20	612
3	-	-	-	20	10	200			
				5	10.20	51	55	10.20	561
				1(loss)	10.20	10.20	54	10.20	550.80
4	10	9.15	91.5	-			54	10.20	550.80
					-	-	10	9.15	91.50
5	-	-	-	40	10.20	408	14	10.20	142.80
							10	9.15	91.50
6	22	10.30	226.6	-			14	10.20	142.80
							10	9.15	31.50
							22	10.30	226.60
7	-	-	-	14	10.20	142.80			
				10	9.15	91.50	8	10.3	82.40
				22	10.30	226.60			

Closing stock 8 tonnes @ Rs. 10.30 = 82.40

POSSIBLE QUESTIONS

PART A (ONE MARKS – ONLINE EXAMINATION)

PART B (2 MARKS)

1. Define material
2. Find out the economic ordering quantity (E.O.Q) from the following particulars:
   Annual usage: Rs. 2,40,000
   Cost of placing and receiving one order: Rs.120
   Annual carrying cost: 10% of inventory value.
3. What are the techniques of inventory control?
4. Write a short note on FIFO
5. Explain LIFO
6. In a company weekly minimum and maximum consumption of material A are 25 and 75 units respectively. The re-order quantity as fixed by the company is 300 units. The material is received within 4 to 6 weeks from issue of supply order. Calculate minimum and maximum level of material A.
7. Explain re- ordering level
8. Write a short note on minimum and maximum level

PART C (6 MARKS)

1 The"received" side of the stores ledger account shows the following particulars:

Jan. 1	opening balance	500 units @ Rs.4
Jan. 5	Received from vendor:	200 units @Rs. 4.25
Jan.12	Received from vendor:	150units @ Rs. 4.10
Jan.20	Received from vendor:	300 units @ Rs. 4.50
Jan.25	Received from vendor:	400 units @ Rs. 4.00

Issues of material were as follows:

Jan. 4 – 200 units: Jan.10- 400 units: Jan 15 -100 units; Jan.19- 100 units: Jan.26- 200 units; Jan. 30- 250 units.

Issues are to be priced on the principle of "First In First Out". Write out the stores ledger account in respect of the materials for the month of January.

2 Compute the i) re-order level; ii) minimum level; iii) maximum level; and iv) average stock level for components A and B based on the following data:

	A	B
Maximum consumption per week (in units)	150	150
average consumption per weeks (in units)	100	100
minimum consumption per week (in units)	50	50
Re-order period (in weeks)	8 to 12	4 to 8
re-order quantity (in units)	400	600

3 The following transaction occur in the purchase and issue of a material:

Jan . 2 purchased 4000units @ Rs.4.00 per unit
Jan. 20 purchased 500 units @ Rs. 5.00 per unit
Feb 5 issued 2,000 units
Feb 10 purchased 6,000 units @ Rs.6.00 per unit
Feb 12 issued 4,000 units
March 2 issued 1,000 units
March 5 issued 2,000 units
March 15 purchased 4,500units @ Rs.5.50 per unit
March 20 issued 3,000 units
From the above table prepare stores ledger account.
By adopting the LIFO method, what would be the value of stock in hand at the end of the period according to each of these two methods?

4 The following particulars have been extracted in respect of Material X. Prepare Ledger account showing the receipts and issues, pricing the materials issued on the basis of Simple Average Method. And Weighted Average Method

Date	**Receipts Quantity**	**Rate**	**Issue Quantity**
2-9-17	200	2.00	-
10-9-17	300	2.40	-
15-9-17	-	-	250

18-9-17	250	2.60	-
20-9-17	-	-	200

5 The following particulars have been extracted in respect of Material Q. Prepare Ledger account showing the receipts and issues, pricing the materials issued on the basis of Weighted Average Method.

Receipts

1st Nov. Purchased 1000 units @ Rs. 4.00 per unit

12th Nov. Purchased 1800 units @ Rs. 4.30 per unit

23rd Nov. Purchased 1200 units @ Rs. 3.80 per unit

Issues

5th Nov. Issued 800 units

15th Nov. Issued 1200 units

25th Nov. Issued 1200 units

(or)

6 Show the Store Ledger entries as they would appear when using

i) FIFO ii) LIFO

January	1	Balance	300 units	Rs. 1200/-
	3	Purchase	200 units	Rs. 880/-
	6	Issued	150 units	
	8	Purchase	200 units	Rs.920/-
	13	Issued	150 units	
	21	Issued	200 units	
	24	Purchase	200 units	Rs. 960/-
	29	Issued	250 units	

. 7 In a factory three components X, Y, Z are used as follows:

Normal Usage	900	Units Per Week Each
Maximum Usage	1,350	Units Per Week Each

Minimum Usage	450 Units Per Week Each		
Re – order quantity	X - 7,200	Y - 9,000	Z – 10,800
Re – order period	X – 2 – 4 weeks	Y – 4 – 6 weeks	Z – 3 – 5 weeks

Calculate for each component :

(a) Re – order Level (b) Minimum Level

(c) Maximum Level (d) Average Stock Level

8 The standard price of a material is fixed at Rs.10 per unit. Prepare the Stores Ledger Account showing how the cost of materials issued and value of balance in stock will be recorded under the standard price method from the following purchases and issues made during April 2016.

April	2	Received	2,000 units	Rs. 11.
	5	Received	1,000 units	Rs. 10
	10	Issued	1,200 units	-
	18	Received	800 units	Rs. 9
	25	Issued	900 units	-
	29	Received	500 units	Rs.12
	30	Issued	1,100 units	-

Also find out the efficiency of purchasing materials.

Syllabus:

Labour: Accounting and Control of labour cost. Time keeping and time booking. Concept and treatment of idle time, over time, labour turnover and fringe benefits. Methods of wage payment and the Incentive schemes- Halsey, Rowan, Taylor's Differential piece wage.

Meaning

"Labour Cost, representing the human contribution to production, is an important cost factor which requires constant control, measurement and analysis."

A rational approach to the problems of labor, fair maintenance of wage records for wage ascertainment, fair wage policy, and the incentives for earning more wages go a long way in providing a sense of security and stability to the workmen, in minimizing the labour turnover, and in exercising effective labour cost control.

Labour cost control aims at the control of the labour cost per unit of production and not at the reduction of the wage rates of the workmen. Efficiency of labour (a concept meaningless to material) has an important impact on the successful working of a business.

Labour cost is second major element of cost. Proper control and accounting for labour cost is one of the most important problems of a business enterprise. But control of labour cost presents certain practical difficulties unlike the control of material cost.

Labour costs represent the various items of expenditure Such as:

Monetary Benefits:

i) Basic Wages;

ii) Dearness Allowance;

iii) Employer's Contribution to Provident Fund;

iv) Employer's Contribution to Employee's State Insurance (ESI) Scheme;

v) Production Bonus;

vi) Profit Bonus;

vii) Old age Pension;

viii) Retirement Gratuity;

Fringe Benefits:

i) Subsidized Food;

ii) Subsidized Housing;

iii) Subsidized Education to the children of the workers;

iv) Medical facilities;

v) Holidays pay;

vi) Recreational facilities.

Control of labour costs is an important objective of management and the realization of this objectives depends upon the cooperation of every member of the supervisory force from the top executive to foreman.

From functional point of view, control of labour cost is effected in large industrial concern by the coordinated efforts of the following six departments-

1) Personnel Department,
2) Engineering Department,
3) Rate or time and Motion Study department
4) Time-Keeper Department
5) Cost Accounting Department
6) Pay-roll Department

Factors Governing a Satisfactory system of Wage Payment

The system should depend upon the nature of the worked and the efforts involved.

a) It should guarantee a minimum living wage to ensure a satisfactory standard of living.
b) It should be based upon a scientific time and motion study.
c) It should be capable of being understood by al the employees.
d) It should be flexible and capable of being adapted to changed circumstances.
e) Its incidence on the cost per unit should be such that it does not form a considerable proportion of the total cost per unit to deprive the employer of a fair margin of profit,

given the market price of the commodity produced by concern.

f) It should reduce the labour turnover.

g) The cost of working the system should be the least.

h) It should boost employee morale.

i) It should be acceptable to trade unions.

j) It should be correlated to the capacity of the concern to pay.

Characteristics of Good Wage System

1. **Fair to both the Parties:**

   The system should be such as may be acceptable gladly to the employer and the employees. for this purpose, the employer should decide the system in consultation with the workers.

2. **Easy to Calculate**

   The workers should be in a position to calculate their wages correctly and feel sure that they have been correctly paid. Easy calculation will help the employer also in maintaining simple records.

3. **Related to Efficiency**

   'Fair remunerations for fair output', should be the idea and remuneration should be related to the individual efficiency of the workers.

4. **Minimum wage guaranteed**

   There should be a guarantee of minimum wages to the workers to enable them to maintain their basic standards of life, and to do away with uncertainty-concept.

5. **Incentive-oriented**

   The wage system should be such that the workers may feel encouraged to product more and earn more wages.

6. **Quality Improvement-oriented**

   In the race to earn more wages with an increase in production, the chances are that the quality of the output may deteriorate. The system should, therefore, ensure 'better wages for better quality'.

Labour Turnover

Labour turnover is an index denoting change in the labour force for an organisatoin during a specified period. In every industry, works leave their job a new workers have to be appointed to replace them. The ratio of the replaced workers to the number of works is the Labour Turnover Ratio. If more workers leave the factory, the turnover would be high, and vice versa. A high turnover is a costly affair and must be avoided.

Causes of Labour Turnover

The workers leave the factory either by

i) Resignation, or by

ii) Discharge by the employer, or

iii) Due to a cause not within one's control.

Measurement of Labour Turnover

Labour Turnover is measured by applying any one of the following three Methods:

1. **Separation Method**

$$\frac{\text{Number of employees left during a period}}{\text{Average number of employees during the period}} \times 100$$

$$\text{Average Number} = \frac{\text{No. at the beginning} + \text{No. at the end}}{2}$$

Multiplication of the formula by 100 indicated Ratio of the turnover in percentage.

2. **Replacement Method**

$$= \frac{\text{Number of replacement in the period}}{\text{Average number of employees during the period}} \times 100$$

In this method, only the actual replacement are counted irrespective of the number of workers left. If new workers are appointed for expansion programme, they are excluded from the number or replacements.

3. **Flux Method**

$$\frac{\text{Number of Separations} + \text{Number of replacement}}{\text{Average number of employees during the period}} \times 100$$

This method is the combination of Method 1 and Method 2.

Effect of Labour Turnover on Cost

A high turnover has an adverse effect on the cost of production due to the following reasons:

1. Change in workers interrupts production and the production goes down.
2. New comers take time in learning the factory procedure and the work procedure.
3. The tools and machines cannot be handled as efficiently by the new workers as hither to done by the old staff. There are chances of more break-downs and of greater cost of repairs of machines.
4. What is true of machines is also true of material handling and usage by the new workers.
5. The rate of accidents may increase, the rate of defectives in the finished output may increase, and there may be increased wastage of time.
6. The cost of making selections and cost of imparting training to the new entrants would further increase the cost and reduce the profits.

Cost of Labour Turnover

There are two types of costs

i) Preventive cost and

ii) Replacement costs

And amenities to the workers that they may be tempted to continue at their job in the factory and not to leave it for example:

i) Personnel Administration: Only that portion of the cost of this department which is related to the maintenance of good relationship between labour and management.

ii) Medical Services-Preventive as well as curative.

iii) Welfare activities and services.

iv) Miscellaneous schemes and benefits, e.g., Provident fund scheme, Pension scheme, Bonus incentives schemes, etc.

The replacement costs are those incurred to recruit new workers and also the costs consequent or incidental to replacement, for example:

i. Cost in selection and appointment
ii. Training cost
iii. Loss of output due to delay in recruitment workers
iv. Cost of inefficiency of new workers
v. Cost of breakage of tools and machinery
vi. Cost of increased spoilage and defectives
vii. Cost of frequent accidents

IDLE TIME

The time when the worker does no work and remains idle, is the idle time. So the idle time cost represents the wages paid for the time lost. The following are its causes:

1. **Lack of proper planning:**

That the production work should go on smoothly depends upon proper planning. If the workers do not have material at the right time, or the machines are not kept fir for working, the time goes waste. Sometimes, delay in the proceeding process delays the operations of the succeeding progress. Here also the workers have to wait due to faulty planning or bad management.

2. **Careless in Supervision:**

If the foreman of a department does not take his duty seriously, the labour working under him also becomes careless and spoils time in the idle way.

3. **Confrontation between labour management:**

The confrontation between labour and management arising form any cause, does waste time in discussions, dialogues, strikes etc., and the wages paid, if any, for this period form the idle time cost.

4. **Economic Factors:**

Trade depression, or serve competition lowers the production, and so labour remains effectively unutilized.

5. **Others reasons:**

The electricity may fail or the machine may break down for some or more time. They make labour to remain idle for the time being.

OVER-TIME

The time worked over and above the normal hours is overtime. The remuneration usually paid for the overtime work is at double the normal rate. The need for over time work arises due to:

1. Increase in demand for the products where the production during the normal hours falls short to meet it;
2. Shortage of workers due to absence or non-availability and so it is decided to give overtime work to the existing staff;
3. Utilization of perishable raw materials by working overtime;
4. Execution of urgent orders, or to complete the work o9n the same day;
5. Shortage of equipments, machines, or space for the completion of jobs;
6. Lack of administrative control on workers, on account of which the production during normal hours remains less the standard output and overtime work has to be done by the workers.

Disadvantages of overtime working

The following are the disadvantages:

1. Worker's health is adversely affected;
2. The quality of the output is at a discount; and
3. The cost of production rises due to increased labour cost.

System of Wage Payment

Strictly speaking, there are only two basic methods of wage payment, viz., wages based on the time spent in the factory, and wages based on the quantum of work turned out. These are thus known respectively as the 'time wage' and the 'piece wage' methods of remuneration. Since

each of these has its own advantages and disadvantages, attempts are made to combine the two, mainly with a view to overcoming their disadvantages. We have therefore, the premium bonus or the incentive schemes which may either be considered to be merely variations of the two, or as another of wage payment. These three methods may also be re-classified into only two groups, viz., the time wage system and the payment by results.

Methods of Remuneration

The methods of remuneration can be classified into:

1. Time Rate System
2. Pieced Rate System
3. Incentive Schemes

1. **Time Rate System**

In this system, a worker is paid on the basis of attendance for the day or according to the hours of the day, regardless of the output. This system is also known as time work, day work, day age rate or day rate. The wage rate of the day worker may be fixed on hourly, daily, weekly, fortnightly, or monthly basis depending on the practice followed in the concern.

The basic feature of this system is that the worker is paid so much per unit of time regardless of the output he produces. The unit of time may be an hour, a day, a week or a month. Under this method, wages depend entirely upon the time clocked, but not on the efficiency of the worker. There are three variants of this system, each differing only in so far as the fixation of the time rate is concerned. They are:

a) Flat Time or Time Rate at Ordinary level;

b) High Day Rate or Time Rate at high level;

c) Measured Day work or Graduated Time Rate.

Graduated Time Rate

Under this method wages are paid at time rates which vary according to

a. Merit-rating of the workers, or
b. Changes in the cost of living index.

It the cost of living goes up, the wages also go up proportionately, and vice versa. Thus the works get the real wages. Similarly, the workers having higher merit rating get higher wages, and the workers with lower rating get lower wages.

Differential Time Rate

Workers are paid rate accounting to their individual efficiency. They are paid normal rate upto a certain percentage of efficiency and the rate increases in steps for efficiency slabs beyond the standard. As the efficiency is measured in terms of output, this method does not fall strictly under the area of time rate system.

2. **Payment by Results-Piece-work Rate**

The payment of wages under this system is based upon the out turn of the worker. The rate is fixed per piece of work and the worker is paid according to the pieces of work completed or the volume of work done by him, irrespective of the time taken by him in completing that work. A workman is free to earn as much as his ability, energy, or skill would allow to him to produce.

The various schemes falling under 'Payment by results' make speed as the basis of payment, instead of time. Accordingly, these schemes are just the opposite of the time wage system. They are so called because of the fact that wages are linked to the volume of work done regardless of the time taken by workers. Efficiency is recognized in all these schemes and workers get wages according to their avility, efficiency, and speed. The following schemes fall under the payment by results method of wage payment.

a. Straight Piece Rate.
b. Differential Piece Rate.

Stability of the System

This system is suitable in the following cases:

1. Where the production can be measured in standard units.
2. Where strict supervision is not possible.
3. Where quality and precision are not of primary importance.

Advantages

1. It provides initiative and incentive to the workers to product more.
2. The productivity increases and cost of production per unit goes down.
3. As there is little wastage of time on the part of the workers, the fixed overheads and resources like plant, machinery and space are well utilized.
4. Workers feel free to work, complete with fellow workers, exhibit their efficiency, and earn more of wages.
5. Less supervision is required over the workers, and happy relations are maintained with them.
6. It is easy to calculate the labor of products.

Disadvantages

1. In the race to earn more wages by producing more, the quality of products is likely to deteriorate. So it requires strict inspection and quality control.
2. Continuous and increased working for some days may cause fatigue and ill health to the workers.
3. To speed up production, the machines, tools, and equipments are sometimes not handled with the care that they require, and so the workers expose themselves to accidents, besides causing loss of breakdown to the machines, equipments etc.,
4. The inefficient workers earning less of wages start feeling jealous of other workers who earn more. This creates unhealthy atmosphere.
5. The workers feel insecure of earning during the days of ill health, holidays, etc.
6. This system is not useful for quality products.

The piece rate System can be classified into:

Straight Piece Rates

It is a simple method of making payment at a fixed rate per unit for the units manufactured.

Earnings = Number of units X Rate per unit

The rate is fixed taking into consideration

a. Time rate for the same class of workers, and
b. Standard output during a given time.

Differential Piece Rates

Under this system, efficient workers are paid wages at a lower rate. A definite standard of efficiency is set for each job and for efficiency below or above the standard different piece rates are paid according to different levels of efficiency. The following two methods of wage payment are studied under this system:

a. Taylor Differential Piece-rate Method, and
b. Merrick Differential Piece rate Method

Taylor Differential Piece-Rate

F.W. Taylor thought to improve the efficiency of workers by suggesting two rates of payment of wages:

(I) A higher rate to the workers who product equal to or more than the standard fixed for production during the day, and

(II) A lower rate to the workers who do not achieve the standard.

Merrick Differential Piece-rate

In the Taylor Method, the effect on the wages is quite sharp in the marginal cases. To remove this defect Merrick suggested three piece rates for a job as follows:

Percentage of Standard Output	Payment under Merrick Method
Upto 83%	Normal piece rate
Above 83% and upto 100%	110% of normal piece rate
Above 100%	120% of normal piece rate

3.Incentive Schemes

Factors for Selecting Incentive Scheme

The following factors should be considered for selecting an incentive scheme:

1. **Productivity**

The object of the incentive scheme is to increase productivity. Therefore, this factor is very important. The increased productivity lowers the cost to the benefit of the employers.

2. **Simplicity**

The scheme should be simple in operations and well understood by the workers. The scheme should be amenable to the setting up of standards and the comparison of the results with the actual.

3. **Cost Reduction**

The scheme, when introduced, is bound to increase the pay-bill of the workers, and thus *increase the cost. But the simultaneous increase in production would reduce the cost per unit or production. The fixed overheads remain constant up to a certain limit of plant capacity. As such, the increased productivity reduces the cost of fixed overheads per unit.

4. **Better Labour Psychology**

The scheme should not affect worker's health adversely, should reduce labour turnover and help to improve the standard of living of the workers.

Under this heading, we study the following methods:

(I) Halsey Premium Scheme;

(II) Halsey Weir Scheme;

(III) Rowan Premium Scheme;

1. **Halsey Premium Scheme**

Under this plan,

(i) Time rate is guaranteed;

(ii) Standard time is fixed for the job or operation;

(iii) The workers producing more than the standard, or the workers completing the work in less than the standard time fixed, get bonus in addition to the ordinary time wage;

(iv) The bonus of the premium, by whatever name called, is 30 to 70 percent of the wages

of time saved, the usual percentage being 50%,

(v) The remaining of the bonus percentage is shared by the employer.

Merits of Halsey Plan

(i) Day wage or the time rate is guaranteed. Even if output is less than the standard, one gets the time wage;

(ii) Workers get premium for the output above the standard. It provides incentive to the workers to produce more;

(iii) As the premium is not 100% but only 50% or so, the employers feel happy about it is a they share the remaining 50%;

(iv) The scheme is very simple and understood easily by the workers.

Demerits

(i) A significant share of the bonus goes to the employers. So the workers object to it;

(ii) Incentive is not so attractive as it is with the piece work;

(iii) Where the workers start saving more than 50% of the time, they earn premium in huge amounts, which the employers do not relish.

2. **Halsey – Weir Scheme**

This schedule is similar to Halsey scheme except that in this scheme the workers and employers share the premium in 1:2 ratio.

3. **Rowan Premium Scheme (variable sharing plan)**

Mr. James Rowan introduced this scheme in Glasgow in 1898. It is similar to Halsey scheme but the premium concept here is different. Here the premium is in the ratio of Time saved to Standard time, calculated on the ordinary wages.

Premium = Wages of time worked x Time saved / Standard Time

Or; (AT x R) TS / ST

This scheme also guarantees day wage as is done by Halsey Plan.

Problem 1

Calculate the earnings of a worker from the following information as under.

a) Time Rate Method: Standard time 30 hours Time taken 20 hours. Hourly rate of wages of Re. 1 per hour plus dearness allowance 50 paise per hour worked.

Problem 2

On the basis of the following information calculate the earnings of A and B on the straight price Rate basis and Taylor's differential piece rate system.

Standard Production 8 units per hour

Normal time rate Rs. 0.40 per hour

Differential to be applied:-

80% of piece rate below standard

120% of piece rate at or above standard. In a 9 hour day, A produces 54 units and B products 75 units.

Problem 3

Calculate the earning of workers A,B and C under Merrick's multiple piece system from the following particulars.

Normal rate per Hour Rs. 1.80

Standard time per unit 1 minute

Output per day as follows:-

Worker A: 384 units

Worker B: 450 units

Worker C: 552 units

Working rows per day are 8

Problem 4

Calculate the earnings of workers A and B under straight piece rate system and Taylor's differential piece rate system from the following particulars.

Normal Rate per hour Rs. 2.40

Standard time per unit 30 seconds

Differentials to be applied:-

80% of piece rate below standard

120% of piece rate at above standard

Worker A produces 800 units per day and

Worker B produces 1000 units per day.

Problem 5

From the following data, total monthly remuneration of three workers A, B and C under the Gant's Task and Bonus Scheme:-

i) Standard Production per month per worker is 1000 units.

ii) Actual Production during the month A = 850 units,

B = 1000 units

C = 1100 units

iii) Piece works rate 50 paise per unit

Problem 6

The existing incentives system of a certain factory is

Normal working week – 5 days of 9 hours plus 3 rate shifts of 3 hrs each.

Rate Payment - Daywork = Re. 1 per hour

- Late shift = Rs. 1.50 per hour

Additional bonus payable – Rs. 2.50 per day shift

Rs. 1.50 per Late shift

Average output per operative for 54 hour week – 120 articles i.e. including 3 Late shifts

In order to increase output and eliminated overtime it was decided to with on to a system of payment by results the following information is obtained.

Time rate Re. 1 per hour

Basic time allowed for 15 articles 5 hours

Piece work rate – Add 20% to piece

Premium – Add 50% to time

You are required to show

i) Hours worked

ii) Weekly earnings

iii) Number of articles produce and

iv) Labor cost per article for one operative under the following sysem

a) Existing time rte

b) Straight piece work

c) Rowan system

d) Halsey weir system

Assume that 135 articles produces in a 45 hours work under (b) (c) and (d) and that the worker earns half time saved under the Halsey system. The additional bonus under the existing system will be discontinued on the proposed incentive scheme.

Problem 7

The Worker earns Rs. 2 as bonus @ 50%. So total bonus at 100% should be Rs. 4. The hourly rate of wages being Re. 1. The time saves should be 4 hours.

Standard time allowed	-	10 hours
Less: time saved	-	4 hours
Time taken	-	6 hours

A worker completes a job in a certain number of hours. The standard time allowed for the job is 10 hrs, and the hourly rate of wages (i.e. Re. 1 the worker earns at the 50% rate of bonus Rs. Under Halsey plan.

Ascertain the total wages under the Rowan premium plan:-

Problem 8

For a certain work order the Standard time is 20 hours, wages Rs. 5 per hour the actual time taken is 13 hours and factory overhead charges are 80% of standard time.

So out a comparative statement showing the effect on paying wages Halsey plan.

Problem 9

A Workman whose basic rate of pay is Re. 1 per hour of working under the 'Rowan' system of premium bonus. In addition he gets dearness allowance of Rs. 20 per week of 48 hours. During one week he does the following jobs.

i) Job 101 for which 25 hours are allowed. He takes 20 hours.

ii) Job 102 for which 30 hours are allowed he takes 24 hours.

During the week, his waiting time amounts to 4 hours. Find the worker's earning and the amounts to be charged to each job and to overhead.

Problem 10

The guaranteed time table is Re. 1 per how high piece rate is Re. 0.20 per unit and standard output is 10 units per hour. In a day of 8 hours, A produces 70 units and B produces 80 units and C produces 90 units. Calculate the earning of A,B and C under Gantt task plan.

Problem 11

Standard output is 10 units per hour and basic wage rate is Re. 1.50 per hour. In a day of 8 hours. A produces 40 units. B 75 units and C produces 90 units. Calculate the wages of A,B and C under Merrick's differential piece rate.

Solution 1:

Time Rate Method:-

Time Put in by workers x Rate per hour = 30 x 1 = Rs. 30

Solution 2

Standard production per hour 8 units

Normal time rate per hour Rs. 0.40

Piece Rate Rs. 0.40/8 = Rs. 0.05

Earnings under the straight piece rate system:-

A: 54 units @ Rs. 0.05 = Rs. 2.70

B: 75 units @ Rs. 0.05 = Rs. 3.75

Differential Piece Rate:-

Low Piece rate: 80% of piece rate (0.05 x 80 / 100) = Rs. 0.04

High Piece rate: 120% of piece rate = (0.05 x 120 / 100) = Rs. 0.06

Standard output per hour is 8 units, So Standard Output for a 9 hour day is 72 units. A produces only 54 units which is less than the standard output of 72 units. So he is entitled to get a lower price rate of Rs. 0.04 per unit. On the other hand, B's output of 75 units is more than the standard output of 72 units. So SA is to get higher piece rate of Re. 0.06 per unit.

A's earning: 54 units @ Re. 0.04 = Rs. 2.16

B's earning: 75 units @ Re. 0.06 = Rs. 4.50

Solution 3

Standard output per minute = 1 units

Standard Production per hour = 60 units

Standard Production per day of 8 hour = 480 units

i.e. (60 x 8)

Normal rate per hour = Rs. 1.80

Normal output per hour = 60 units

Therefore Normal piece rate = (1080/60) x 5 paise

Calculation of level of Performance:-

Standard output per day = 480 units

Worker A's Output per day = 384 units

Worker A's level of performance = (384/480) x 100 = 80%

Worker B's Output per day = 450 units

Worker B's level of performance = (450/480) x 100 = 43%

Worker C's Output per day = 550 units

Worker A's level of performance = (550/480) x 100 = 1150%

Earnings of workers A:-

Merrick's multiple piece rate system:-

For 384 units @ 3 paise per unit = (384 x 3) /100 = 11.50

Normal piece rate has been applied because worker A's level of performance is 807. Which is below 83%.

Earning of Worker B:-

For 450 units @ 3.3 Paise per unit = 450 x 3.3/100 = Rs. 14.85

Worker B's level of Performance is 93.75% which is between 83% and 100%. So he is entitled to get 110% of normal piece rate.

Earning of Worker C:-

For 552 units @ 3.6 paise per unit = (552 x 3.6)/100

Rs. 19.87

Worker C's level of performance is 115% which is more than 100% of standard output. So it is entitled to get 120% of normal Piece rate.

Solution 4

$$\text{Hourly Production} = \frac{3600}{1000} = 120 \text{ units}$$

$$\text{Piece rate} = \frac{2.210}{120} = 0.005$$

Low piece rate:-

LPR = 80% of normal piece rate

= 80% x 0.005

= 0.004

High piece rate:

HPR = 120 of 0.005

= 0.006

Standard Production per day = 120 units x 8

= 960 units

Computation of earnings of A and B:-

	A	B
Normal Piece Rate	0.005	0.005
Production per day	800	1000
Standard Production Per day	960 units	960 units
a. Straight piece Rate System	800 x 0.005	1000 x 0.005
Earning	Rs. 4.80	Rs. 5
b. Taylor's Differential piece Rate	0.004 x 800	0.006 x 1000
	Rs. 3.2	Rs. 6.00

Solution 5

Standard Production per month is 1000 units and piece rate is 50 paise per unit so guaranteed monthly payment is Rs. 500 (i.e. 1000 units @ 50 paise)

Level of Performance:-

Standard output per month 1000 units

Worker A's Output 850 units

Worker A's level of Performance = $\frac{1000}{1000}$ x 100 = 85%

Workers B's Output:-

Worker B's level of Performance x 100 = 100%

Workers C's Output:-

Worker C's level of Performance x 100 = 110%

Earning of Worker A:-

Worker A's level of Performance is 85% which is below the standard performance so it will get Rs. 500 the guaranteed monthly payment.

Earning of Worker B:-

Worker B's level of performance is 100% so he will get piece wages for 1000 units plus 20% bonus

Piece Wages for 1000 units @ 50 paise per unit	Rs. 500
Add: 20% bonus i.e. (500 x 20)/100	Rs. 100
Total earning	Rs. 600

Earning or Worker C:-

Worker C's level of Performance is 110% which is more than the standard Performance so he will get piece wage prices 20% bonus.

Thus dis earnings are as follows:-

Price wages for 1,100 units @ 50 paise per unit	Rs. 550
Add: 20% bonus (550 x 20)/100	Rs. 110
Total earning	Rs. 660

Solution 6

a) Existing time Rate:-	Rs.
Weekly wages 45 hrs. @ Re. 1 per hour	4500
9 hrs @ Re. 1.50 per hour	13.50
Day shift bonus 5 x 2.50	12.50
Late shift bonus 3 x 1.50	4.50
Total Earning	75.50
b) Piece rate system:-	
Basic time: 5 hours for 15 articles	
Therefore cost of 15 articles	5.00
Add: 20%	1.00
Total Earning	6.00

Therefore Rate per article Rs. 6.00 / 15 = Rs. 0.40

Articles products in a week = 45 x 15/5 = 135

Hence Earning = 135 x 0.40 = Rs. 54.00

c) Rowan Premium System:-

Basic time = 5 hrs for 15 articles

Adding 50% = 7½ has for 15 articles

Therefore time for producing one articles

= 7½ hrs / 15 = 30 minutes

Therefore time allowed for 135 articles = 67 ½ hrs

Actual time taken for 135 articles 45 hrs

Therefore time saved = 22½ hrs

Earning = Time wages x (% of time saved / Standard Time) x Time wage

= 45 x 1 + (22½ / 67½) x 45 = 45 + 15 = 60

d) Halsey-Weir Premium System

Earning = Time wage + 50% (Time saved x Time rate)

= 45 x 1 + 50% (67½ - 45) x 1

= 45 + 11.25 = Rs. 56.25

The other requirements of the problems have been shown in the following table

Methods

	a	b	c	d
i) Hours worked	45	54	45	45
ii) Weekly earning Rs.	75.50	54.00	60.00	56.25
iii) Articles produces	120	135	135	135
iv) Labour cost per article	0.629	0.400	0.444	0.417

Solution 7

The worker earns Rs. 2 as bonus at 50% so total bonus at 100% should be Rs. 4. The hourly rate of wages being Re. 1 the time saved should be 4 hrs.

Standard time allowed	10 hours
Less: Time saved	4 hours
Time taken	6 hours

Earning under the roman Premium Plan:-

Earning	=	T x R + (S – T / S) x T x R
Where T	=	Time taken i.e., 6 hours
S	=	Standard time i.e. 10 hours
R	=	Rate per hour i.e. Re. 1
Therefore Earning	=	6 x 1 + (10-6/10) x 6 x 1
	=	Rs. 6 + Rs. 2.40
	=	Rs. 8.40

Solution 8

Earning	=	A.T x T.R + 50% (T.S. x T.R)
	=	13 x 5 + 50% (7 x 5)
	=	65 + 17.5
	=	Rs. 82.50

Solution 9

Workers earning form Job 101 :-

Standard time 25 hours

Time taken 20 hours

Rate per hour Re. 1

Wages for actual time = 20 hrs @ 1 Re.

Premium according to Roman System

= Time taken x Rate per hr. + (Time saved / Standard time) x Actual time x Rate per hr

= 20 x 1 + (5/25) x 20

= Rs. 24 Rs. 24.00

Proportion of dearness allowances:-

= 20 x (25/55)

Earning from job 101 Rs. 9.09

Total Rs. 33.09

The workers earning from job 102:-

Standard time = 30 hours

Time taken = 24 hours

Rate per hour = 1 Re.

Earning = T x R + (T.S /Std) x A.T x R

= 24 x 1 + (6/30) x 24

= 24 + 4.8

= Rs. 28.80

Proportion of Dearness allowance:-

= 20 x (30 / 55)

= Rs. 10.91

Earning from job 102 Rs. 39.71

Total earning of the worker:-

Job 101 = Rs. 33.09

Job 102 = Rs. 39.71

Read = Rs. 4.00

Total = Rs. 76.80

Solution 10

Standard Output at 10 units per hour is 80 units.

A's output is below the Standard

B's output is at the standard and C's output is above the standard.

Accordingly A gets time wages, B gets a bonus of 20% of the time rate and C gets high piece rate.

Earnings:	A	=	8 hours x Re. 1	= Rs. 8
	B	=	8 hours x Re. 1.20	= Rs. 9.60
	C	=	90 hours x Re. 0.20	= Rs. 18

Solution 11

Standard output	=	10 units per hour
Basic wage Rate	=	Rs. 1.50 per hour
Piece rate	=	1.50 / 10 = Rs. 0.15

Percentage efficiency:-

=(Actual output / Standard output) x 100

For A	=	(40 x 100/80)	=	50%
For B	=	(75 x (100/80)	=	93.75%
For C	=	(90 x 100/90)	=	112.5%

A's efficiency being less than 83% he is paid the ordinary piece rate. B's efficiency being 83% to 100%. He is paid at 110% of ordinary piece rate. C's efficiency being more than 100% he is paid at 120%.

Thus:	A gets 40 x Re. 0.15	=	Rs. 6.00
	B gets 75 x 0.165	=	Rs. 12.37
	C gets 90 x Re. 0.18		

POSSIBLE QUESTIONS

PART A (ONE MARK – ONLINE EXAMINATION)

PART B (2 MARKS)

1.Write a Short note on Direct Labour
2.Write a short note on fringe benefits.
3.What is labour turnover?
4.Define labour
5.Write a short note on Indirect Labour
6. What are the different departments.
7.Explain halsey premium plan
8.Write a short note on Rowan plan.
9. Write a short note on replacement Method

PART C (6 MARKS)

1.Difference between Cost Allocation and Apportionment

2. Calculate the normal and over time wages payable to a workman from the following data:

Days	Hours Worked
Monday	8
Tuesday	10
Wednesday	9
Thursday	11
Friday	9
Saturday	4
Total	51

Normal Working hours 8hrs per day

Normal Rate Rs.1 per Hour

Overtime Rate upto 9 hours in a day and 48 hrs in a week at single rate and 9 hours and over 48 hours in a week in a day at double rate

3 From the following data provided to you find out the Labour Turnover Rate by Applying

a) Flux Method

b) Replacement Method and Separation Method

Number of Workers on the pay roll

At the beginning of the month 500

At the end of the month 600

During the month 5 workers left, 20 persons were discharged and 75 workers were recruited. Of these, 10 workers were recruited in the vacancies of those leaving, while rest were engaged for an expansion Scheme.

4 A factory has three production departments and two service departments. The Following figures have been extracted from the financial books:

Particulars	Rs
Supervision	10,000
Repairs of Plant and Machinery	5,000
Rent	10,000
Light	3,000
Power	4,000
Employer's contribution to ESI	600
Canteen Expenses	2,000

The following further details have been extracted from the books of the respective departments:

Particulars	P	Q	R	S	T
Direct Wages (Rs.)	3,000	3,000	2,000	2,000	1,000
Area of Square feet	2,000	1,000	500	500	100
No. of Employees	50	40	20	20	10
Value of Machinery	10,000	5,000	3,000	3,000	1,000
Light Points	80	60	30	30	20
H.P. of Machines	200	100	50	50	20

6 From the following information -

Standard Time 20 hours

Hourly Rate of wages Rs. 4

Time Taken by A – 16 hours, B- 10 hours and C – 8 hours.

Calculate the Total Earnings and the Rate Earned Per Hour of three workers under the Halsey and Rowan Plans; the hours under Halsey Plan is 50 % of the time saved.

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

The actual time taken by a worker is 15 hours.

Calculate the earnings per hour under

(i) Time Wage System

(ii) Piece Wage System

(iii) Rowan Scheme

Syllabus:

Elements of Cost: Classification, allocation, apportionment and absorption of overheads; Under- and over-absorption; Capacity Levels and Costs; Treatments of certain items in costing like interest on capital, packing expenses, bad debts, research and development expenses; Activity based cost allocation.

Overhead Accounting

The ultimate aim of Overhead Accounting is to absorb them in the product units produced by the firm. Absorption of overhead means charging each unit of a product with an equitable share of overhead expenses. In other words, as overheads are all indirect costs, it becomes difficult to charge them to the product units. In view of this, it becomes necessary to charge them to the product units on some equitably basis which is called as 'Absorption' of overheads. The important steps involved in Overhead Accounting are as follows:-

(a) Collection, Classification and Codification of Overheads.

(b) Allocation, Apportionment and Reapportionment of overheads.

(c) Absorption of Overheads.

As mentioned above, the ultimate of Overhead Accounting is 'Absorption' in the product units. This is extremely important as accurate absorption will help in arriving at accurate cost of production. Overheads are indirect costs and hence there are numerous difficulties in charging the overheads to the product units.

(a) Collection, Classification and Codification of Overheads: - These concepts are discussed below:-

Collection of Overheads:

Document	Overhead Costs	Nature
Stores Issue note, purchase voucher	Indirect material	Consumables, lubricants etc.
Payroll sheets, time sheets	Indirect labour	Wages, salaries, contribution to statutory benefits, bonus, incentives, idele time
Cash books	Indirect material, Indirect labour & indirect expenses	All type of costs
Subsidiary records – journal	Indirect material, Indirect labour & indirect expenses	For provisions of costs that are not actually paid for
Other reports	Indirect expenses	Depreciation, scrap, wastage etc.

Overheads collection is the process of recording each item of cost in the records maintained for the purpose of ascertainment of cost of each cost centre or unit.

The following are the source documents for collection of overheads:-

(i) Stores Requisition

(ii) Wages Sheet

(iii) Cash Book

(iv) Purchase Orders and Invoices

(v) Journal Entries

(vi) Other Registers and Records

Source document and the nature of overheads are enumerated as below.

For the purpose of overhead accounting, collection of overheads is very important. It is necessary to identify the indirect expenses and the above mentioned source documents are used for this. Proper collection of overhead expenses will help to understand accurately the total overhead expenses.

Classification of Overheads

Classification is defined by CIMA as, 'the arrangement of items in logical groups having regard to their nature (subjective classification) or the purpose to be fulfilled (Objective classification). In other words, classification is the process of arranging items into groups according to their degree of similarity. Accurate classification of all items is actually a prerequisite to any form of cost analysis and control system. Classification is made according to the following basis:

Based on Elements: Indirect Materials, Indirect labour and Indirect expenses.

Based on Functions of the organisation: Manufacturing overheads, Administrative overheads, Selling and Distribution overheads, Research & Development overheads.

Based on the Behaviour: Fixed Overheads, Variable Overheads & Semi variable overheads. **Classification according to Elements**

According to this classification overheads are divided according to their elements. The classification is done as per the following details:-

Indirect Materials

Materials which cannot be identified with the given product unit of cost centre is called as indirect materials. *As per CAS-3 indirect material cost is defined as 'Materials, the cost of which cannot be directly attributed to a particular cost object'*. For example, lubricants used in a machine is an indirect material, similarly thread used to stitch clothes is also indirect material. Small nuts and bolts are also examples of indirect materials.

Indirect Labour

As per CAS-3, indirect employee cost is the employee cost, which cannot be directly attributed to a particular cost object. Wages and salaries paid to indirect workers, i.e. workers who are not directly engaged on the production are examples of indirect wages.

Indirect Expenses

As per CAS-3, Indirect Expenses are expenses, which cannot be directly attributed to a particular cost object. Expenses such as rent and taxes, printing and stationery, power, insurance, electricity, marketing and selling expenses etc. are the examples of indirect expenses.

Functional Classification

Overheads can also be classified according to their functions.

This classification is done as given below:-

Manufacturing Overheads

As per CAS-3, Indirect Cost involved in the production process or in rendering service. Manufacturing overheads has different names such as Production Overheads, Works Overheads, Factory Overheads. Indirect expenses incurred for manufacturing are called as Manufacturing Overheads. For example, factory power, works manager's salary, factory insurance, depreciation of factory machinery and other fixed assets, indirect materials used in production etc. It should be noted that such expenditure is incurred for manufacturing but cannot be identified with the product units.

Manufacturing is a separate function like administration, selling and distribution. The term manufacturing stands for activities, which begin with receipt of order and end with completion of finished product. Manufacturing Overhead represents all manufacturing costs other than direct materials and direct labour. These costs cannot be identified specifically with or traced to cost object in an economically feasible way. In other words, manufacturing overhead are indirect manufacturing costs. The term overhead is peculiar and therefore, there is a growing tendency to prefer the term indirect manufacturing cost to overhead. Following synonyms have been used for Manufacturing Overhead:-

(i) Factory overhead;

(ii) Manufacturing overhead;

(iii) Factory on cost;

(iv) Works on cost;

(v) Factory burden and;

(vi) Manufacturing expenses.

Given below are a few examples of different items included in different groups of manufacturing overhead:

Indirect Material Cost: Glue, thread, nails, rivets, lubricants, cotton waste, etc.

Indirect Labour Cost: Salaries and wages of foremen and supervisors, inspectors, maintenance, labour, general labour; idle time etc.

Indirect Services Costs: Factory Rent, factory insurance, depreciation, repair and maintenance of plant and machinery, first aid, rewards for suggestions for welfare, repair and maintenance of transport system and apportioned administrative expenses etc.

Manufacturing Overhead further explains in apportionment, allocation and absorption.

Administrative Overheads

Indirect expenses incurred for running the administration are known as Administrative Overheads. *As per CAS-3, Administrative Overheads are defined as Cost of all activities relating to general management and administration of an organisation*.

As per the functional classification, Administration Overheads comprise of those indirect costs which are related to the general administrative function in the company. Such functions are related to policy formulation, directing the organisation and controlling the operations of the company. Administration overheads are incurred for the benefit of organisation as a whole. Controlling them is difficult for they do not vary with most of the variables viz. production or sales. Examples of such overheads are, office salaries, printing and stationery, office telephone, office rent, electricity used in the office, salaries of administrative staff etc. The size as well as control over these overheads depends largely on decisions of management. Organisations growing very fast face the problem of controlling Administrative Overheads. Multi-location set up leads to duplication of many administrative costs.

Collection and Absorption of Administration Overheads

The collection of overheads is done firstly by nature of the expenses through the chart of accounts. Administrative departments in an organisation could be Corporate Office, Finance and Accounts, Company Secretary, Human resources, Legal, General Administration. The overheads that are common to all these departments are apportioned on some suitable basis e.g. in the following manner:

(a) For Office rent, rates & taxes - Floor space as the basis,

(b) For Depreciation on office building - Floor space as the basis

(c) For Legal fees - No of cases handled as the basis

(d) For Salaries of common staff - Ratio of salaries of departments as the basis

(e) For Typist pool - No of documents typed as the basis

Absorption of the Administrative Overheads into cost units is very difficult. Many times it is advised that these overheads may not be absorbed into product units because of the difficulty and non-relevance of them with production activity. Normally, the Administrative Overheads are totalled together and then using a suitable basis, a rate of recovery is arrived at to absorb the same. It could be mostly a percentage of Works cost or factory cost. Based on the principle of *'charging what the traffic can bear'*, the absorption could be on the basis of a percentage of gross profit. Whatever method selected, it will be arbitrary and could lead to erroneous conclusions. A Cost Accountant has to use all the experience and history of the organisation before he selects a particular method to adopt.

Treatment of Administration Overheads

There are three different ways of treating the administration overheads as follows:-

1) Apportion between Production and Selling & Distribution functions:

This treatment is based on the logic that the administrative functions are for the entire company and these functions facilitate both production as well as selling. In other words, the absorption of Administration Overheads would happen through Production and Selling

Overheads. This means these overheads lose their identity. The problem is of course, selection of basis to divide these overheads over the two principal functions of production and selling.

2) Transfer to P & L Account

This method agrees that administrative costs are all time based costs and as such bear no relation what is produced or what is sold. These are mainly of fixed nature. Hence there is no point in dividing them further to be included in the cost of production or cost of selling. They should be simply charged to the P & L Account. However, this may lead to undervaluation of stocks.

3) Treating as a separate addition to cost of production & sales

In this method, administration is treated as a separate function and is added as a separate line in the cost computation sheet for a job or an order. Here again, the basis for inclusion as a part of cost of a job is a difficult choice. Generally, a percentage of factory cost is taken as a basis. A care needs to be taken to ensure that the Administration Overheads are charged equitably to Cost of Sales, FG stock and WIP as well.

Controlling Administration Overheads

Given the nature of these expenses, they cannot be controlled at the lower level of management. They can be better controlled by top management as they pertain to formulating policy and directing the organisation. The first step in the control mechanism is proper classification of expenses departmentalisation. The actual expenses are collected for each department and then compared with a bench mark. Deviation are analysed and causes for increase are mitigated by fixing responsibility on the departmental head.

The control benchmarking can be done with respect to:

(i) Figures of the previous year. Expenses could be compared with the figures of previous year and increase or decrease are analysed. However, comparison with previous year may not help as the condition may have totally changed from one year to the other.

(ii) Use of budgets. Budgets are estimates for the current year, and they take into account the changed conditions. They also built in the year's complete plan which would factor all changes in the cost structure. It is advisable to compare budgeted overheads with actual for control purpose.

(iii) Use of standards. Although very scientific, this method is difficult to operate. Administrative activities (being very subjective) cannot be standardised. On a certain level it can be applied e.g. the time taken to process a voucher by accountant can be standardised, or time taken for processing a payment could be standardised.

Selling and Distribution Overheads

As per CAS-3, Selling Overheads, also known as Selling Costs, are the expenses related to sale of products and include all Indirect Expenses in sales management for the organization. Overheads incurred for getting orders from consumers are called as Selling Overheads. On the other hand, overheads incurred for execution of order are called as Distribution Overheads. As per CAS-3, *Distribution Overheads, also known as Distribution Cost, are the cost incurred in handling a product from the time it is ready for dispatch until it reaches the ultimate consumer*. Examples of Selling Overheads are sales promotion expenses, marketing expenses, salesmen's salaries and commission, advertising expenses etc. Examples of Distribution Overheads are warehouse charges, transportation of outgoing goods, packing, commission of middlemen etc.

The magnitude of S & D Overheads in the total cost would depend on many factors such as nature of the product, type of customers, spread of market, statutory restrictions etc. A consumer product needs heavy expense on advertising. A sale to institutions rather than individual customers needs a different selling effort. Distribution Costs will increase if the spread of the market is large. Some activities cannot be advertised at all such as a Doctor, a Cost Accountant. The total magnitude of S & D Costs and the proportion of selling and distribution efforts will decide the treatment thereof and control mechanisms to be used. For some of selling expenses there may not be a direct relationship with the product. If a company incurs expense on advertising, it may be difficult to relate to a specific product unless it's a product advertisement.

But further, there may be a substantial time lag between the expense and the benefit arising out of that. In case of Distribution Costs many of them may be possibly linked to the product.

Collection and Absorption of S&D Overheads

While classifying the S & D Costs are properly bifurcated and coded accordingly. This could be done by having separate account codes for Selling Overheads such as: advertising, sale commission, travelling expense, communication, exhibition, market survey, free samples, credit & collection costs, bad debts, and Distribution expenses such as: transportation vehicle related expenses, warehousing and storage at different places, depreciation. Depending upon the size of the organization, there may be proper departmentalization of S&D activities. The departments could be:

- Sales head office
- Sales regional offices
- Depots
- Direct selling department
- Dealers management
- Credit and collection (commercial)

The costs are collected through various source documents under the above heads and for the above departments. For absorption, the basis to be used will have practical difficulties, as one will have to look for a relationship between the expenses and the cost unit. Some expenses like sales commission, shipping costs, and direct selling expenses can be absorbed directly. The other expenses can be absorbed on the basis of either sales value, cost of goods sold, gross profit or number of units sold. Out of these the sales value method is the most commonly used.

Control over S & D Expense

The S & D Expenses are related to sales and distribution activity which is externally focused. The extent of these expenses depend mainly on external factors like consumer profile, changing habits, technology improvements etc. Controlling these expenses does not mean capping them. It aims at increasing the effectiveness of these expenses e.g. getting maximum

sales per rupee of S & D Expenses. For control purpose, a great care should be taken to ensure correct classification and collection of S & D Overheads. The collected expenses must be analysed to assess the effect of them on sales. Such analysis could be done as follows:

(a) Analysis of sales and S & D Expenses by geographical locations – This could be regions, zones, domestic and international etc.

(b) Analysis by type of customers - This could be done as institutional, government, retail etc.

(c) Analysis by products or services – This may be done as range of products, the application of products, brands etc.

(d) Analysis by salesmen.

(e) Analysis by channel of distribution – This analysis pertains to wholesalers, retailers, commission agents etc.

The analysis of sales, profits and S & D expenses on the basis of above factors will give a good insight into the performance as well as control over expenses. All these three parameters may be compared with

- Previous year;
- Budget for the current year or
- Standards for the current year

Allocation, Apportionment and Reapportionment of Overheads

After the collection, classification and codification of overheads, the next step is allocation and apportionment of overheads into the product units. The following steps are required to complete this process.

Departmentalization

Before the allocation and apportionment process starts, the first step in this direction is 'Departmentalization' of overhead expenses. Departmentalization means creating departments in the firm so that the overhead expenses can be conveniently allocated or apportioned to these departments. For efficient working and to facilitate the process of allocation, apportionment and

reapportionment process, an organization is divided into number of departments like, machining, personnel, fabrication, assembling, maintenance, power, tool room, stores, accounts, costing etc and the overheads are collected, allocated or apportioned to these departments. This process is known as 'departmentalization' of overheads which will help in ascertainment of cost of each department and control of expenses.

Allocation

CIMA defines Cost Allocation as, 'the charging of discrete, identifiable items of cost to cost centres or cost units'. In simple words *complete distribution of an item of overhead to the departments or products on logical or equitable basis is called allocation.* Where a cost can be clearly identified with a cost centre or cost unit, then it can be allocated to that particular cost centre or unit. In other words, allocation is the process by which cost items are charged directly to a cost unit or cost centre. For example, electricity charges can be allocated to various departments if separate meters are installed, depreciation of machinery can be allocated to various departments as the machines can be identified, salary of stores clerk can be allocated to stores department, cost of coal used in boiler can be directly allocated to boiler house division. Thus allocation is a direct process of identifying overheads to cost units or cost centres. So the term allocation means allotment of whole item of cost to a particular cost centre or cost object without any division.

Apportionment

Cost Apportionment is the allotment of proportions of items to cost centers. Wherever possible, the overheads are to be allocated. However, if it is not possible to charge the overheads to a particular cost centre or cost unit, they are to be apportioned to various departments on some suitable basis. This process is called as 'Apportionment' of overheads. The basis for apportionment is normally predetermined and is decided after a careful study of relationships between the base and the other variables within the organisation. The Cost Accountant must ensure that the selected basis is the most logical. A lot of quantitative information has to be collected and constantly updated for the purpose of apportionment. The basis selected should be

applied consistently to avoid vitiations. However, there should be a periodical review of the same to revise the basis if needed.

In simple words, distribution of various items of overheads in portions to the departments or products on logical or equitable basis is called apportionment.

A general example of various bases that may be used for the purpose of apportionment is shown below:

Overhead item	Basis
Rent and building	Floor space occupied by each department
General Lighting	No. of light points in each department
Telephones	No. of extensions in a department
Depreciation of factory building	Floor space
Material handling	No. of material requisitions or Value of material issued

The above list is not exhaustive and depending upon peculiarities of the organisation, it could be extended. *This allocation and/or apportionment is called as* ***primary distribution of overheads.***

Distinction between Allocation & Apportionment

Although the purpose of both allocation and apportionment is identical, i.e to identify or allot the costs to the cost centres or cost unit, both are not the same.

Allocation deals with the whole items of cost and apportionment deals with proportion of items of cost.

Allocation is direct process of departmentalization of overheads, where as apportionment needs a suitable basis for sub-division of the cost.

Whether a particular item of expense can be allocated or apportioned does not depends on the nature of expense, but depends on the relation with the cost centre or cost unit to which it is to be charged.

Principles of Apportionment of Overhead Cost

(i) **Services Rendered**

The principle followed in this method is quite simple. A production department which receives maximum services from service departments should be charged with the largest share of the overheads. Accordingly, the overheads of service departments are charged to the production departments.

(ii) **Ability to Pay**

This method suggests that a large share of service department's overhead costs should be assigned to those producing departments whose product contributes the most to the income of the business firm. However the practical difficulty in this method is that, it is difficult to decide the most paying department and hence difficult to operate.

(iii) **Survey or Analysis Method**

This method is used where a suitable base is difficult to find or it would be too costly to select a method which is considered suitable. For example, the postage cost could be apportioned on a survey of postage used during a year.

(iv) **Efficiency Method**

Under this method, the apportionment of expenses is made on the basis of production targets. If the target is exceeded, the unit cost reduces indicating a more than average efficiency. If the target is not achieved, the unit cost goes up, disclosing there by, the inefficiency of the department.

Illustration 1

A factory has 3 production departments (P1, P2, P3) and 2 service departments (S1 & S2). The following overheads & other information are extracted from the books for the month of January 2016.

Expense	Amount `
Rent	6,000

Repair	3,600
Depreciation	2,700
Lighting	600
Supervision	9,000
Fire Insurance for stock	3,000
ESI contribution	900
Power	5,400

Particulars	P1	P2	P3	S1	S2
Area sq ft	400	300	270	150	80
No. of workers	54	48	36	24	18
Wages	18,000	15,000	12,000	9,000	6,000
Value of plant	72,000	54,000	48,000	6,000	
Stock Value	45,000	27,000	18,000		
Horse power of plant	600	400	300	150	50

Allocate or apportion the overheads among the various departments on suitable basis.

Solution:

The primary distribution of overheads is as follows:- `

Expense	**Total**	**Basis**	**P1**	**P2**	**P3**	**S1**	**S2**
Rent	6,000	Area sq ft	2,000	1,500	1,350	750	400
Repair	3,600	Plant value	1,440	1,080	960	120	-
Depreciation	2,700	Plant value	1,080	810	720	90	-
Lighting	600	Area sq ft	200	150	135	75	40

Supervision	9,000	No of workers	2,700	2,400	1,800	1,200	900
Fire Insurance for stock	3,000	Stock value	1,500	900	600	-	-
ESI contribution	900	Wages	270	225	180	135	90
Power	5,400	Horse power	2,160	1,440	1,080	540	180
Total	31,200		11,350	8,505	6,825	2,910	1,610

Secondary Distribution of Production Overheads

After the primary distribution as shown above is over, the next step is to re-distribute the service department costs over the production departments. This also needs to be done on some suitable basis, as there may not be a direct linkage between services and production activity. The products actually do not pass through the service departments. So does it mean that the service cost is not a part of cost of production? It very much is the part of production cost! Hence the loading of service costs onto the production departments is necessary. *This process is called secondary distribution of overheads.*

The basis for secondary distribution is dependent on:-

(i) The nature of service given e.g. it may be maintenance department or stores.

(ii) Measurement of service based on surveys or analysis.

(iii) General use indices

In the above Illustration No. 1, the costs of S1 (`2910) and that of S2 (`1610) will have to be loaded on to the totals of P1, P2 and P3.

Some examples of the bases that can be used to distribute cost of different service departments:

Service department	**Basis**
Quality	No of inspection done
Maintenance	No of maintenance calls or Material usage for maintenance or Time spent on maintenance
Stores	Indirect material cost or

	No of issue slips or Quantity of material issued or Value of stock handled
Canteen, welfare	No workers
Internal transport	No. of trucks or trolleys used or Tonne-miles consumed
Payroll office	No. of labour hours
Purchase office	No of purchase orders or Value of material purchased

Again this is not an exhaustive list and could differ from company to company. Many times percentage estimation is also done for such distribution if the service cannot be measured on the basis of any of the above bases. It may be decided that the cost of S1 is to be distributed as P1-40%, P2-25% and P3-35%. Such arbitrary method should be avoided as far as possible.

Methods of Secondary Distribution

(a) Direct Distribution Method

This method is based on the assumption that one service department does not give service to other service department/s. Thus between service departments there is no reciprocal service exchange. Hence under this method, service costs are directly loaded on to the production departments. This is simple, but the assumption may not be correct. Can we say that the canteen service is not available to other service departments like labour office or stores or maintenance department? This is incorrect and thus the method should not be used as far as possible.

In the above example consider that if the S1 and S2 costs are to be distributed on assumption of services rendered as S1 to P1- 40%, P2-30% and P2-10% and the S2 costs are on the basis of 5:3:2, then the table for redistribution of S1 and S2 costs over the production departments P1, P2 and P3 will be as given below.

Department	**Total**	**Basic**	**P1**	**P2**	**P3**
Overheads as per primary distribution	26,680		11,350	8,505	6,825
Distribution of S1	2,910	40%;30%;30	1,164	873	873

		%			
Distribution of S2	1,610	5:3:2	805	488	322
Total	31,200		13,319	9,861	8,020

(b) Step Distribution Method

This method does away with the assumption made under above method, but only partly. It recognises that a service department may render service to the other service department, but does not receive service from it. In above example, S1 may render services to S2 but not vice versa, i.e. S2 may not render service to S1. In such situation, cost of that service department will be distributed first which render services to maximum number of other service departments. After this, the cost of service department serving the next large number of departments is distributed. This process is continued till all service departments are over. Because it is done in steps, it is called as Step Method of Distribution.

Illustration 2

A manufacturing company has two production departments Fabrication and Assembly and 3 service departments as Stores, Time Office and Maintenance. The departmental overheads summary for the month of March 2016 is given below:

Fabrication - `24000
Assembly - `16000
Stores - `5000
Time office - `4000
Maintenance - `3000

	Production departments		Service departments		
Particulars	Fabrication	Assembly	Stores	Time office	Maintenance

No of employees	40	30	20	16	10
No of stores requisition slips	24	20			6
Machine Hours	2400	1600			

Apportion the costs of service departments to the production departments.

Solution:

We will have to determine the sequence in which the service departments should be selected for distribution and the bases on which each of them will be distributed. The following logical bases are decided based on the additional information given:

Time office - No of employees

Stores - No of stores requisitions

Maintenance - Machine hours

Also, it can be easily noticed that the time office serves maximum departments (i.e. both production departments, stores & maintenance departments). Stores serve the next larger number of departments (i.e. both production departments and maintenance department).

Maintenance department serves only production departments. Hence the sequence for distribution will be time office, stores and maintenance. This is shown in the following table:

Particulars	Total	Basis	Fabrication	Assembly	Time office	Stores	Maintenance
As per primary distribution	52,000	as given	24,000	16,000	4,000	5,000	3,000
Time office	4,000	no of employees	1,600	1,200	(4,000)	800	400

Stores	5,800	no of req. slips	2,784	2,320		(5,800)	696
Maintenance	4,096	Machine hours	2,458	1,638			(4,096)
		Total	30,842	21,158			

Please notice when we distribute the time office costs first, the charge to stores department is `800. This makes the total cost of stores to be distributed as `5800 (5000+800).Same is the logic for `4096 of Maintenance department.

(c) Reciprocal Service Method: This method takes cognizance of the fact that service departments may actually give as well as receive services from and to the other service departments on reciprocal basis. Such inter-departmental exchange of service is given due weight in the distribution of the overheads. *There are two methods used for distribution under this logic. One is called Repeated Distribution Method and the other Simultaneous Equation Method.*

(d) Repeated Distribution Method: This is a continuous distribution of overhead costs over all departments.

The decided ratios are used to distribute the costs of service departments to the production and other service departments. This is continued till the figures of service departments become 'nil' or 'negligible'.

Illustration 3

The summary as per primary distribution is as follows:

Production departments A- `2400; B- `2100 & C- `1500

Service departments X – `700; Y- `900

Expenses of service departments are distributed in the ratios of:

X dept. : A- 20%, B- 40%, C- 30% and Y- 10%

Y dept. : A- 40%, B- 20%, C- 20% and X- 20%

Show the distribution of service costs among A, B and C under repeated distribution method.

Solution:

Particulars	Production departments			Service departments	
	A	B	C	X	Y
As per primary distribution	2400	2100	1500	700	900
Service dept X	140	280	210	(700)	70
Service dept Y	388	194	194	194	(970)
Service dept X	38.8	77.6	58.2	(194)	19.4
Service dept Y	7.76	3.88	3.88	3.88	(19.4)
Service dept X	0.776	1.552	1.164	(3.88)	0.388
Total	2975.336	2657.032	1967.244	0	0.388

It can be noticed that the undistributed balance in service department is very negligible and thus can be ignored for further distribution

(e) Simultaneous Equations Method: Under this method, simultaneous equations are formed using the service departments' share with each other. Solving the two equations will give the total cost of service departments after loading the inter- departmental exchange of services. These costs are then distributed among production departments in the given ratios.

In the above Illustration No. 3, service dept X gives 10% of its service to Y and receives 20% of Y's service. Let '*x'* be the total expenses of dept X (its own + share of Y) and '*y'* be the total expenses of dept Y (its own + share of X)

This can be expressed as:

'x' = 700 + 20% of '*y*' and

'y' = 900 + 10% of '*x'*

i.e. *x = 700 + 0.2y and*

y = 900 + 0.1x

Multiplying both equations by 10, we get

10x = 7000 + 2y i.e. 10x –2y = 7000 and

10y = 9000 + x i.e. -x+10y = 9000

Now multiplying 2nd equation by 10, and then adding the two equations we

get, 98y = 97000

Thus y = 990 and x = 898

Based on this we distribute the service department costs over production departments.

Redistribution Statement

	Department				
	A	**B**	**C**	**X**	**Y**
Primary Distribution	2400	2100	1500	700	900
X	180	359	269	(898)	90
Y	396	198	198	198	(990)
Total	**2976**	**2657**	**1967**	—	—

(f) Trial and Error method

This method is to be followed when the question of distribution of costs of service cost centres which are interlocked among them arises. In the first stage, gross costs of services of service cost centres are determined. In the second stage cost of service centres are apportioned to production cost centres.

Limitations of Apportionment

Whichever method we may use, it still depends on a suitable basis used. The basis will always lead to approximations. If an approximate data is used for analysis, control and decision-making, it may cause erroneous results. Thus one has to be careful in relating the cost data to cost centre or cost unit. The natural relation of most of the indirect costs i.e. overheads is to a time period. In other words, almost all overheads are period costs and hence an attempt to link it to cost unit will always be arbitrary. As such, the traditional methods of allocation and apportionment are often challenged by many in the industry. The techniques like Marginal Costing owe their origin to such limitations of Traditional Costing.

Capacity of Overhead Rate

Influence of activity level on overhead rate

In determination of overhead rate, a good deal depends upon the activity level, which is assumed. In other words, capacity consideration influence overhead rate. Overhead rate will be different at different capacity levels. Efficient utilization of capacity is desirable both for society and management. Following capacity concepts merit consideration for overhead rate determination:-

Theoretical or Maximum Plant Capacity

Maximum Capacity or the Ideal Capacity is the capacity for which plant is designed to operate. It is only Theoretical Capacity. It does not give allowance for waiting, delays and shut-down. The capacity is significant for designing the plant mechanically. For cost considerations, this capacity is not important. Ideal Capacity is never used to determine overhead rates for its disregard to even necessary interruptions in production process.

Practical Capacity

When this capacity is determined, allowance is given for unavoidable interruptions like time lost for repairs, inefficiencies, breakdown, delay in delivery of raw material and supplies, labour shortages and absence, Sunday, holidays, vacation, inventory taking, etc. Thus, Practical Capacity is the maximum Theoretical Capacity with minor unavoidable interruptions. These unavoidable interruptions are based mostly on internal influences and do not consider main external causes like lack of customers orders. The Practical Capacity is determined with reference to nature of industry and circumstances in which a particular factory is situated. Normal unavoidable interruptions account for 15% to 25% of the maximum capacity. The Practical Capacity, thus, ranges between 75% and 85% of maximum capacity after giving allowance for normal unavoidable interruptions.

Normal Capacity

Idle capacity due to long-term sales trend only is reduced from Practical Capacity to get Normal Capacity. Calculation of Normal Capacity of a plant presents considerable problems. Normal Capacity is determined for the business as a whole. Then, it is broken down by plants

and departments. For Normal Capacity determination, prime considerations are physical capacity and average sales expectancy. It should be noted that average sales expectancy to be considered for this purpose takes into account a period enough to level out cyclical fluctuations. The determination of Normal Capacity helps in: i) the preparation of flexible budgets and computation of predetermined factory overhead rates. Ii) the use of Standard Costing, iii) estimating sales price etc., iv) scheduling production, v) inventory valuation, vi) determination of breakeven point, vii) controlling costs.

Importance of determining Normal Capacity

The Normal Capacity considerations are important for:

(a) budget preparation;

(b) determination of overhead rate;

(c) determination of standard cost, and

(d) preparation of operation of operational plans.

For determining the Normal Capacity, machinery purchased for future use and outmoded machinery should be excluded for consideration.

Capacity based on Sales Expectancy

Capacity may be based on sales expectancy for the year. The distinction between Normal Capacity and capacity based on sales expectancy should be properly understood. While Normal Capacity considers the long-term trend analysis of sales, which is based on sales of a cycle of years, the capacity based on sales expectancy is based on sales for the year only. When long-term sales trends are determined, cycle of years long enough to even out cyclical fluctuations is considered. Capacity based on sales expectancy is influenced more by general economic conditions and forecast of industry than long term sales trends. The main advantages of determining overhead rate based on sales expectancy are

i) Overhead rate is linked with actual sales expectancy, ii) Overhead costs are adequately spread over the production and iii) Overhead rate determined for this purpose is very useful for making decisions like price fixation, etc.

Idle Capacity and Excess Capacity

Practical Capacity is determined after giving allowance to unavoidable interruptions like time lost for repairs, inefficiencies, breakdown and labour shortage, etc., Even this Practical Capacity is not normally fully achieved. Some losses due to idleness of workers and plant facilities to occur even in most carefully administered companies. These losses are not taken into account for determining the Practical Capacity, because for the purpose of determining Practical Capacity only unavoidable interruptions are considered. Thus, the difference between Practical Capacity and Normal Capacity, i.e., the capacity based on long-term sales expectancy is the Idle Capacity. However, if Actual Capacity happens to be different from capacity based on sales expectancy, the idle capacity will represent difference between Practical Capacity and Actual Capacity. Idle Capacity is that part of Practical Capacity which is not utilized due to factors like temporary lack of orders, bottlenecks and machine breakdown, etc. Idle Capacity represents unused productive potential, which fails to be realized due to interruptions that are not unavoidable. Idle capacity is that part of Practical Capacity which is not utilized due to irregular interruptions.

Idle Capacity is different from Excess Capacity. Idle Capacity refers to temporary idleness of available resources due to irregular interruptions. Excess Capacity results either from managerial decision to retain larger production capacity or from unbalanced equipment or machinery within departments. Excess Capacity refers to that portion of Practical Capacity which is available, but no attempt is made for its utilization for strategic or other reasons. If the Excess Capacity results from purchase of assets not required, it will be a prudent policy for company to dispose of the assets which cause Excess Capacity. Alternatively, action should be taken for utilization of resources in the form of Excess Capacity. Excess Capacity also results from imbalance or bottlenecks in certain departments. This situation can be remedied by attempting synchronization in the working of various departments, working overtime, running double shift and temporary off-loading to departments having spare capacity. While overhead

rate includes cost of Idle Capacity, Excess Capacity is excluded from overhead rate consideration.

Idle time is distinguished from Idle Capacity and its cost is separated in the accounts. Idle time represents lost time of men and machines arising from lack of business or of material, a breakdown of equipment, faulty supervision or other similar causes whether avoidable on not. Idle Capacity is the difference between Practical Capacity and Actual Capacity and represents the unused production potential.

Idle Capacity costs are represented mostly by the fixed charges of owing and maintaining plant and equipment and of employing services, which are not used to their maximum potential. The principal causes of idle capacity are:

Production Causes

These causes primarily result from poor organization of operational plan. Following production causes often lead to Idle Capacity:-

(a) Repetitive machine adjustment - i) Setup and change-over. ii) Repairs and adjustment.

(b) Lack of materials or tools – i) Internal ii) External

(c) Lack of supervision, inspection and instruction.

(d) Lack of power – i) Internally produced. ii) Externally produced

Administrative Causes:

Sometimes various administrative decisions taken at various level of management result in Idle Capacity. Major administrative causes that lead to Idle Capacity are: a) Excess plant for anticipated expansion,

b) Special machines prepared for particular jobs, and c) Strikes / Lockouts.

Economic Causes

Sometimes demand for the goods is seasonal as in case of wool, ice cream and furs and production cannot be evenly distributed. This is especially true, when there exists danger of deterioration of the product or where carrying charges for stock are too large. Thus, seasonal, cyclical and industrial causes also lead to Idle Capacity.

Various practices are followed in different companies for disposing of Idle Capacity cost. It is often agreed in principle that normal production losses should be absorbed in product costs. Abnormal losses should be treated as non-operating expenses in product costs. Abnormal losses should be treated as non-operating expenses by direct debit to Profit and Loss Account. Certain companies follow the practice of computing idle time costs on their leading products by use of statistical techniques. Cost Accountants should particularly analyse the reasons for idle plant and equipment not used during the period for non-con-controllable causes. The review of practices of different companies reveals that Idle Capacity is a somewhat flexible concept. It is an individual problem which should be considered after taking into account the special situations. For the growth and survival of the organisation, the management is keenly interested to know the idleness, its causes, its cost and its available remedies. Normally different companies follow a bit varying restricted accounting concept of Idle Capacity. In many cases unabsorbed fixed overhead represents losses due to managerial decisions and it becomes a subjective matter to refer it as idle capacity cost. Overhead rates of different capacity levels will be different due to influence of fixed overhead.

Absorption of Overheads

Once the steps of primary and secondary distribution are carried out, what we get is total indirect costs of production departments. The next step is to assign these totals to the individual product units. A job or a product passes through all or many production departments before it is formed into a finished saleable product. It is necessary to know the cost of each department it passes through per unit. The absorption of overhead enables a Cost Accountant to recover the overhead cost spent on each product department through each unit produced. Overhead absorption is also known as levy or recovery of overheads. How is this done? Suppose in turning department a total of 1200 tubes are turned and the cost of turning department overheads (after secondary distribution) are `72000, then can we say the cost of turning per tube is `6/-? Most probably yes. This `6 per unit is called as *Overhead Absorption Rate.*

Absorption means 'recording of overheads in Cost Accounts on an estimated basis with the help of a predetermined overhead rate, which is computed at normal or average or maximum capacity'

In general, the formula for overhead absorption rate is give as:-

Overhead Rate = Amount of Overhead / No of units of the base

Overhead Absorption Rates: For the purpose of absorption of overhead in costs of jobs, processes, or products overhead rates related to suitable factors or bases to be determined. There are several methods in use for determining the overhead rates i.e Actual or Predetermined Overhead Rate, Blanket or Multiple Rates.

Actual Overhead Rate

Actual Overhead Rate is obtained by dividing the overhead expenses incurred during the accounting period by actual quantum on the base selected. Assuming that the rates are worked out on a monthly basis the formula is:-

Overhead Rate = Actual overhead during the month ÷ Value/Quantity of the base during the month Absorption of overheads based on actual rates may not be adopted due to the following reasons:-

(a) Actual overhead rate can be computed only after the accounting period is over.

(b) The incidence of some of the items of expenses like repairs, overhauling, etc is not uniformly spread over all the accounting periods.

(c) Actual overhead rates do not provide any basis for cost control.

Pre-determined Overhead Rate

Predetermined Rate is computed by dividing the budgeted overhead expenses for the accounting period by the budgeted base (quantity, hours, etc)

Overhead Rate= Budgeted overhead expenses for the period / Budgeted Base for the period

Advantages of Predetermined Overhead Rate

(a) Enables prompt preparation of cost estimates, quotations and fixation of selling prices.

(b) Cost data is available to management along with financial data.

(c) In case of Cost –plus contracts prompt billing is possible through pre-determined recovery rates.

(d) In concerns having budgetary control system, no extra clerical efforts are required in computing the pre-determined overhead rate.

Blanket (Single) Overhead Rate

A single overhead rate for the entire factory may be computed for the entire factory. So this is known as factory wide or Blanket Overhead Rate Method.

Blanket Rate = Overhead Cost for the factory / Total Quantum of the base.

Blanket Rate of overheads may be applied suitable in a small size concerns. Blanket Rates are easy to compute. The use of Blanket Rate of overheads gives erroneous and misleading results, where several products passing through number of different departments. With Blanket Rate of overhead, satisfactory level of managerial control is not possible.

Multiple Rates:

This method is most commonly used to determine the multiple overhead rates, i.e separate rates:

(a) For each producing department;

(b) For each service department;

(c) For each Cost Centre; and

(d) For each product line.

The multiple rates are worked out according to the below formula:

Overhead Rate = Overhead cost allocated & apportioned to each product, dept / Corresponding Base

The number of overhead rates a firm may compute would be fixed taking into consideration of two opposing factors viz clerical costs involved and the degree of accuracy level desired.

Production Unit Method

Simply put the concept here is to average out the total overheads on total units produced. In a tube manufacturing unit the total overheads are `72000 and total tubes processed are 12000. The overhead absorption rate is: 72000/12000 i.e. `6 per tube. If this rate is based on the budgeted costs and number of units, and if the factory now gets an order for 2500 tube processing, the amount of production overheads to be charged to that order will be (2500 * 6) i.e. `15000/-

Percentage of Direct Wages

Under this method, overhead for a job is recovered on the basis of a predetermined percentage of direct wages. This method is used when the component of direct wages is higher. If the overhead to be absorbed is `120000 and the direct wages are estimated at `800000, the predetermined rate will be calculated as (120000/800000) i.e. 15%. If a job is received where direct wages are estimated at `9000/-then the production overheads to be absorbed will be 15% of `9000 i.e. `1350 This method is useful if the direct labour hours can be standardised and the labour rates do not fluctuate too much. However, this method ignores the contribution made by other resources like machinery. The method also ignores the fact that there may be different types or grades of workers and each may cost differently. It also sidelines the fact that most of the production overheads are time-related.

Percentage of Direct Material Cost

Here the absorption rate is expressed as a percentage of direct material cost. This method is useful when the proportion of material cost is very high and that of labour cost is comparatively negligible. It is useful if material grades and rates do not fluctuate too much. If production overhead to be absorbed is `2000 and the material cost is expected to be `4000, then the absorption rate will be (2000/4000) i.e. Thus 50% of direct material cost. Thus for a job requiring direct material of `200, the production overheads to be absorbed will be `100 i.e. 50% of `200. However, many overhead items bear no relationship with material cost, and also the fact of time dimension of overheads is not taken into account by this method.

Percentage of Prime Cost

This method combines the benefits of direct wages and direct material cost methods as we know prime cost means direct material plus direct wages plus direct expenses. This method could be used when prime cost constitutes a major proportion of the cost and the rates of material & labour are stable. It is needed that the product made is standard product. If the prime cost is expected to be `50000 and the production over heads are estimated at `2500, then the absorption rate will be 5% of prime cost. If a job has a prime cost of `800, then overhead absorbed on that job will be `40/-

Direct Labour Hour

Under this method, the absorption rate is calculated by dividing the overhead amount by the actual or predetermined direct labour hours. This is extremely useful when the production is labour intensive. This method is superior to the earlier ones, because it takes cognizance of the time factor. If the direct labour hours for a month amount to 10000 and the overheads to be absorbed are `5000, then the absorption rate is `0.50 per hour (i.e. 5000/10000). If a job is going to require a labour time of 250 hours, the production overheads to be loaded on the job will be `125 (i.e. 250 * 0.50). The data related to labour hours has to be properly collected or estimated. The labour hour rate may be calculated as a single rate or different for different group of workers.

Machine Hour Rate

In the days of mechanised production processes, the most relevant rate to be applied is the machine hour rate. This is the rate calculated by dividing the actual or budgeted overhead cost related to a machine or a group of machines by the appropriate number of machine hours. These hours could be actual hours or budgeted hours. When budgeted hours are used they are taken at average capacity at which a factory normally operates. You cannot take full capacity hours as the factory may not operate at that level and then the absorption rate may be unnecessarily fixed at a lower level. The overheads in a highly mechanised factory are mostly

related to the number of hours a machine runs. Hence this is supposed to be the best method for absorbing overhead costs into the cost unit. If a machine normally runs for 2000 hours in a month and monthly overheads to be absorbed are `15000, then the machine hour rate will be calculated as (15000/2000) i.e. `7.50 per machine hour. If a job take 75 hours on that machine, then `562.50 (75 * 7.5) will have to be loaded as cost of using the machine for that job.

A machine hour rate may be calculated using only those overheads which are directly related to the machine e.g. power, fuel, repairs, maintenance, depreciation etc. These expenses are totalled and then divided by the hours to compute the rate. This is called as *Ordinary Machine Hour Rate.* Whereas, if costs not related to machine are also included (e.g. supervision, rent, lighting, heating etc.) for the rate calculation, such rate is called as *Composite Machine Hour Rate.* While calculating machine hour rate, the wages paid to machine operators may be added to the total costs. This is because these operators directly wok on the machines & thus related to machine operation. At times a factory may have more than one similar machines simultaneously working. In such case, *a group machine hour rate* may be calculated.

Factors influencing the selection of Overhead Recovery Rate

The particular method or methods selected for application in a company would depend upon the factors mentioned below. Selection of the most equitable method is of paramount importance since a method that is not suitable will distort costs and thus make them useless for control and decision making purpose.

Selection of Overhead Recovery Rates depends on the following factors:-

(a) Nature of the product and process of manufacture.

(b) Nature of overhead expenses.

(c) Organisational set-up of the undertaking into departments and or cost centers.

(d) Individual requirements with regard to the circumstances prevailing.

(e) Policy of the management.

(f) Accuracy vis-a-vis cost of operating the method. Some of the methods are comparatively more accurate and provide equitable bases for overhead absorption.

The main features of a satisfactory overhead rate are as follows:-

(a) Simple, easy to operate, practical and accurate;

(b) Economic in application;

(c) Fairly stable so that cost from period to period does not vary;

(d) Related to time factor as far as practical;

(e) Departmental rates are preferable to blanket rates;

(f) Area of activity selected for computation of the rate should be homogeneous cost unit;

(g) Base for the rate should lay stress on the main production element of the concern.

Under-absorption and Over-absorption of Overhead

The amount of overhead absorbed in costs is the sum total of the overhead costs allotted to individual cost units by application of the overhead rate. When a predetermined rate worked out on the basis of anticipated or budgeted overhead and base is applied to the actual base, the amount absorbed may not be identical with the amount of overhead expenses incurred if either the actual base or the actual expenses or both deviate from the estimates or the budget.

If the amount absorbed is less than the amount incurred , which may due to actual expenses exceeding the estimate and / or the output or the hours worked may be less than the estimate, the difference denotes under-absorption.

On the other hand if the amount absorbed is more than the expenditure incurred, which may be due to the expense being less than estimate and / or the output or hours worked may be exceeding the estimate, this would indicate over-absorption, which goes to inflate the costs.

Under or over absorption of overhead may arise due to one or the other of the causes given below:-

(a) Error in estimating overhead expenses.

(b) Error in estimating the level of production, i.e the base.

(c) Major unanticipated changes in the methods of production.

(d) Unforeseen changes in the production capacity.

(e) Seasonal fluctuations in the overhead expenses from period to period.

(f) Overhead rate may be applied to the Normal Capacity which may be less than the full operating capacity of the undertaking.

How does one deal with the situation of over or under absorption. There are three ways to handle it:

(a) *Write-off (in case of under absorption) or write back (in case of over-absorption) to the P & L* Account. This treatment is valid if most of the overhead items are related to time.

(b) *Carry forward to the next period through a reserve account*. This method is not recommended on the logic that it is inconsistent with Accounting Standards.

(c) *Use of supplementary rates* to adjust the effect to the cost of sales, finished stocks and Work in Process stocks. This sounds logical as it does not carry forward the unabsorbed or over absorbed overheads to the next accounting period entirely. It aims at splitting the total effect between the cost of sale (which is charged to current year's profits) and stocks (which get carried forward to the next year).

Illustration 4

Overhead incurred	` 1,50,000
Overhead recovered	` 1,00,000
Cost of sales	` 10,00,000
Finished goods	` 8,00,000
Work in process	` 7,00,000

Solution:

Here, the overheads under-absorbed are (1,50,000-1,00,000) `50,000.

Total of Cost of sales, FG stock & WIP is `25,00,000

The supplementary rate will be 50,000/25,00,000 i.e. `0.020

This will be distributed as:

`20,000 to cost of sales (i.e. 10,00,000 x 0.020)

`16,000 to FG stock (i.e. 8,00,000 x 0.020) and

`14,000 to WIP (i.e. 7,00,000 x 0.020)**Reporting of overhead costs:**

Presentation:

- Overheads shall be presented as separate cost heads like production, administration and marketing.
- Element wise and behavior wise details of the overheads shall be presented, if material.
- Any under-absorption or over-absorption of overheads shall be presented in the reconciliation statement.

Disclosure:

- The basis of assignment of overheads to the cost objects.
- Overheads incurred in foreign exchange.
- Overheads relating to resources received from or supplied to related parties
- Any Subsidy / Grant / Incentive or any amount of similar nature received / receivable reduced from overheads.
- Credits / recoveries relating to the overheads.
- Any abnormal cost not forming part of the overheads.
- Any unabsorbed overheads.

Illustration 5

In an Engineering Factory, the following particulars have been extracted for the quarter ended 31st December, 2015. Compute the departmental overhead- rate for each of the production departments, assuming that overheads are recovered as a percentage of direct wages.

	Production Depts.			**Service Depts.**	
	A	**B**	**C**	**X**	**Y**
Direct Wages (`)	30,000	45,000	60,000	15,000	30,000
Direct Material	15,000	30,000	30,000	22,500	22,500

No. of workers	1,500	2,250	2,250	750	750
Electricity KWH	6,000	4,500	3,000	1,500	1,500
Assets Value	60,000	40,000	30,000	10,000	10,000
No. of Light points	10	16	4	6	4
Area Sq. Yards	150	250	50	50	50
The expenses for the period were:					
		`			
Power		1,100			
Lighting		200			
Stores Overhead		800			
Welfare of Staff		3,000			
Depreciation		30,000			
Repairs		6,000			
General Overheads		12,000			
Rent and Taxes		550			

Apportion the expenses of Service Dept. Y according to direct wages and those of Service Department X in the ratio of 5: 3 : 2 to the production departments.

Solution:

Statement showing apportionment of overheads and computation of OH rates:

Particulars	Basis	Total (`)	A (`)	B (`)	C (`)	X (`)	Y (`)
Material	Actual	45,000	—	—	—	22,500	22,500
Wages	Actual	45,000	—	—	—	15,000	30,000
Power	KWH (4:3:2:1:1)	1,100	400	300	200	100	100

Lighting	Light Points (5:8:2:3:2)	200	50	80	20	30	20
Stores overhead	Materials (2:4:4:3:3)	800	100	200	200	150	150
Welfare of staff	No. of workers (2:3:3:1:1)	3,000	600	900	900	300	300
Depreciation	Assets Value (6:4:3:1:1)	30,000	12,000	8,000	6,000	2,000	2,000
Repair	Assets Value (6:4:3:1:1)	6,000	2,400	1,600	1,200	400	400
General Over-heads	Direct Wages (2:3:4:1:2)	12,000	2,000	3,000	4,000	1,000	2,000
Rent & Taxes	Area (3:5:1:1:1)	550	150	250	50	50	50
		1,43,650	**17,700**	**14,330**	**12,570**	**41,530**	**57,520**
Costs of 'X'	5:3:2		20,765	12,459	8,306	(41,530)	—
Costs of 'Y'	2:3:4		12,782	19,173	25,565	—	(57,520)
			51,247	**45,962**	**46,441**	—	—

Overhead Rate as % on direct wages

A = [51,247/30,000] x 100 = 170.82% B = [45,962/45,000] x 100 = 102.14% C = [46,441/60,000] x 100 = 77.40%

Illustration 6

The New Enterprises Ltd. has three producing departments A,B and C two service Departments D and E. The following figures are extracted from the records of the Co.

`

Rent and Rates	5,000
General Lighting	600
Indirect Wages	1,500
Power	1,500
Depreciation on Machinery	10,000
Sundries	10,000

The following further details are available:

	A	B	C	D	E
Floor Space (Sq.Mts.)	2,000	2,500	3,000	2,000	500
Light Points	10	15	20	10	5
Direct Wages	3,000	2,000	3,000	1,500	500
H.P. of machines	60	30	50	10	--
Working hours	6,226	4,028	4,066	--	--
Value of Material	60,000	80,000	1,00,000	--	--
Value of Assets	1,20,000	1,60,000	2,00,000	10,000	10,000

The expenses of D and E are allocated as follows:

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

What is the factory cost of an article if its raw material cost is `50, labour cost `30 and it passes through Departments A, B and C. For 4, 5 & 3 hours respectively.

Solution:

Statement showing apportionment of overheads to departments

Particulars	Basis	Total (`)	A (`)	B (`)	C (`)	D (`)	E (`)
Rent & Rates	Space (4:5:6:4:1)	5,000	1,000	1,250	1,500	1,000	250
Lighting	Light Points (2:3:4:2:1)	600	100	150	200	100	50
Indirect wages	Direct wages (6:4:6:3:1)	1,500	450	300	450	225	75
Power	Horse Power (6:3:5:1)	1,500	600	300	500	100	--
Depreciation	Value of Asset (12:16:20:1:1)	10,000	2,400	3,200	4,000	200	200
Sundries	Direct wages (6:4:6:3:1)	10,000	3,000	2,000	3,000	1,500	500
Wages	Actual	2,000	--	--	--	1,500	500
		30,600	**7,550**	**7,200**	**9,650**	**4,625**	**1,575**

Repetitive Distribution Method `

Particulars	A	B	C	D	E
Totals	7,550	7,200	9,650	4,625	1,575
Cost of D (2:3:4:1)	925	1,387	1,850	(4,625)	463
	8,475	8,587	11,500	--	2,038
Cost of E (4:2:3:1)	815	408	611	204	(2,038)
	9,290	8,995	12,111	204	--
Cost of D (2:3:4:1)	41	61	82	(204)	20
	9,331	9,056	12,193	--	20
Cost of E (4:2:3:1)	8	4	6	2	(20)
	9,339	9,060	12,199	2	--
Cost of D (2:3:4:1)	--	1	1	(2)	--
	9,339	9,061	12,200	--	--
Working Hours	6,226	4,028	4,066		
Rate per hour	1.5	2.25	3.00		

Illustration 7

The following information relates to the activities of a production department of factory for a certain period.

	`
Material used	36,000
Direct Wages	30,000
Labour hours	12,000
Hours of Machinery-operation	20,000
Overhead Chargeable to the Dept	25,000

On one order carried out in the department during the period the relevant data were:-

Material used (`)	6,000
Direct Wages (`)	4,950
Labour hours worked	1,650
Machine Hours	1,200

Calculate the overheads chargeable to the job by four commonly used methods.

Solution:

The four commonly used methods of absorbing or recovering overheads are as follows:

1. % of overheads on material = (25,000 / 36,000) x 100 = 69.44%
2. % of overheads on direct wages = (25,000 / 30,000) x 100 = 83.33%
3. Overhead rate per labour hour = 25,000 / 12,000 2.083
4. Machine hour rate method = 25,000 / 20,000 = 1.25

The overheads chargeable to job under the above methods is as follows:

1. Material = 6,000 x 69.44% = 4,166.40
2. Wages = 4,950 x 83.33% = 4,125
3. Labour hour rate = 1650 x 2.083 = ` 3,437
4. Machine hour rate = 1,200 x 1.25 = ` 1,500

POSSIBLE QUESTIONS

PART A (ONE MARKS – ONLINE EXAMINATION

PART B (2 MRKS)

1. Write a short note on allocation
2. Explain absorption of overheads.
3. Define Overheads
4. Explain over and Under absorption
5. What are the source documents for collection of overheads?
6. Write a short note on Manufacturing overheads
7. What are the different types of Department in Manufacturing Concern.
8. Explain administration Overheads
9. Write a short note on normal capacity

PART C (6 MARKS)

1. Discuss the types of department.
2. In a factory there are three Production Department P_1, P_2, P_3 and one service department S_1. The following figures are available for one month of 25 working days of 8 hours each day. All the department work all these days with full attendance,

Expenses	Total Rs	Service Dept S_1 Rs	Production Dept P_1 Rs	Production Dept P_2 Rs	Production Dept P3 Rs
Power and Lighting	1,100	240	200	300	360
Supervisor Salary	2,000	-	-	-	-
Rent	500	-	-	-	-
Welfare	600	-	-	-	-
Others	1,200	200	200	400	400
Total	**5,400**				
Supervisor Salary		20%	30%	30%	20%
Number of Workers		10	30	40	20
Floor area in Sq.Meters		500	600	800	600
Service rendered by service		-	50%	30%	20%

Dept to Production department					

Calculate Labour Hour for each department P_1, P_2 and P_3

3. Explain the principles of apportionment of overhead costs.

4. XYZ manufactures households pumps which pass through 3 departments expenses are as follows.

	Foundry Rs	**Machine Shop Rs**	**Assembling Rs**	**Total Rs**
Direct Wages	10,000	50,000	10,000	70,000
Work Overheads	5,000	90,000	10,000	1,05,000

The factory cost of manufacturing type C pumps was prepared by the company as follows:

	Rs	**Rs**
Materials		16
Direct wages Foundry Machine Shop Assembling	 2 4 2	 8
Work Overheads (150% of direct wages)		12
Total Cost		36

It seems that there is some fallacy. Find out the proper expenses of XYZ Company.

5. **.** From the information, find the profit made by each product, appropriating joint-costs on the sale-value basis

Joint – Cost :	**Rs.**
Direct Materials	1,26,000
Power	25,000
Petrol, Oil, Lubricants	5,000
Labour	7,500
Other Charges	4,100

	Product X	**Product Y**
Selling Costs	Rs. 20,000	Rs. 80,000
Sales	Rs. 1,52,000	Rs. 1,68,000

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

   Prepare Process I Account and the Abnormal Gain or Abnormal Loss Account as the case may be.

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

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

Expenses of Service Departments P and Q are apportioned as under :

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

Syllabus:

Methods of Costing: Unit costing, Job costing, Contract costing, Process costing (process losses, valuation of work in progress, joint and by-products), Service costing (only transport).

Meaning:

The term 'methods' and 'systems' are used synonymously to indicate an integrated set of procedures based on a complex concept of ideas, principles and concepts. The term method of costing refers to cost ascertainment. Different methods of costing for different industries depend upon the production activities and the nature of business. For these, costing methods can be grouped into two broad categories:

METHODS OF COSTING

(1) Job costing and

(2) Process costing.

(1) Job Costing

Job costing is also termed as Specific Order Costing (or) Terminal Costing. In job costing, costs are collected and accumulated according to jobs, contracts, products or work orders. Each job is treated as a separate entity for the purpose of costing. The material and labour costs are complied through the respective abstracts and overheads are charged on predetermined basis to arrive at the total cost. Job costing is used in printing, furniture making, ship building, etc.

Job costing is further classified into

(a) Contract costing

(b) Cost plus contract and

(c) Batch costing

(a) Contract Costing:

This method of costing is applicable where the job work is big like contract work of building. Under this method, costs are collected according to each contract work. Contract

costing is also termed as Terminal Costing. The principles of job costing are applied in contract costing.

(b) Cost plus Contract:

These contracts provide for the payment by the contracted of the actual cost of manufacture plus a stipulated profit. The profit to be added to the cost. It may be a fixed amount or it may be a stipulated percentage of cost. These contracts are generally entered into when at the time of undertaking of a work, it is not possible to estimate its cost with reasonable accuracy due to unstable condition of material, labour etc. or when the work is spread over a long period of time and prices of materials, rates of labour etc. are liable to fluctuate.

(c) Batch Costing:

In Batch Costing, a lot of similar units which comprise the batch may be used as a cost unit for ascertainment of cost. Separate Cost Sheet is maintained for each batch by assigning a batch 306 A Textbook of Financial Cost and Management Accounting number. Cost per unit of product is determined by dividing the total cost of a batch by the number of units of the batch. Batch Costing is used in drug industries, ready-made garments industries, electronic components manufacturing, T V Sets, etc.

(2) Process Costing

This costing method refers to continuous operation or continuous process costing. Process costing method is applicable where goods or services pass through different processes to be converted into finished goods. Process costing is used in Cement industries, Sugar industries, Textiles, Chemical industries etc.

The following are the important variants of process costing system:

(a) Operation Costing:

It is concerned with the determination of the cost of each operation rather than process. It offers scope for computation of unit operation cost at the end of each operation by dividing the total operation cost by total output of units.

(b) Operating Costing:

Operating costing is also termed as service costing. Operating costing is similar to process costing and is used in service industries. This method of costing is suitable for concerns rendering services.

For example, Hospitals, Transport, Canteen, Hotels, etc.

(c) Output Costing:

Output costing is also called Unit Costing (or) Single Costing. This method of costing is applicable where a concern undertakes mass and continuous production of single unit or two or three types of similar products or different grades of the same products. Under this method cost per unit is measured by dividing the total cost by number of units produced. Output Costing is used in industries like Cement, Cigarettes, Pencils, Quarries etc.

(d) Multiple Costing:

This method of costing means combination of two or more methods of costing like operation costing and output costing. Under this method the cost of different sections of production are combined after finding out the cost of each and every part manufactured. This method of costing is suitable for the industries manufacturing motor cars, engines, aircraft, tractors, etc.

TECHNIQUES OF COSTING

Costing is the technique and process useful to allocation of expenditure, cost ascertainment and cost control. In order to fulfill the needs of the management it supplies necessary information to the management. The following are the various techniques of costing:

(a) Uniform Costing
(b) Marginal Costing
(c) Standard Costing
(d) Historical Costing
(e) Absorption Costing

(a) Uniform Costing:

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 firms 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.

(b) Marginal Costing:

The C. I. M. A. London defines Marginal costing as "a technique of costing which aims at ascertaining marginal costs, determining the effects of changes in costs, volume, price etc. on the Company's profitability, stability etc. and furnishing the relevant data to the management for enabling it to take various management decisions by segregating total costs into variable and fixed costs."

(c) Standard Costing:

Standard Costing is a technique of cost accounting which compares the standard cost of each product or service with actual cost to determine the efficiency of the operation, so that any remedial action may be taken immediately.

(d) Historical Costing:

Historical costing is the ascertainment and recording of actual costs when, or after, they have been incurred and was one of the first stages in the growth of the Cost Accountant's work. Actual costs refer to material cost, labour cost and overhead cost.

(e) Absorption Costing:

Absorption Costing is also termed as Full Costing (or) Orthodox Costing. It is the technique that takes into account charging of all costs both variable and fixed costs to operation processed or products or services. .

SOME OTHER METHODS OF COSTING

The methods used for the calculation of cost per unit of output are known as costing methods. Different methods are available for the calculation of the cost per unit of output. The choice of a specified method depends on the manufacturing process. According to the terminology of CIMA, there are two generic classes of costing methods:

1. Specific order costing
2. Process costing

Specific order costing:

This is also known as job costing or terminal costing. This category of costing method is suitable for the work (job, batch, contract) of separate identity in nature which is mostly authorized by a specific order. Under this category, job costing, batch costing, contract costing are included.

Process costing:

This is also known as operation costing or period costing. This category of costing method is suitable for industries manufacturing goods using a series of continuous or repetitive processes or operations. Under this category, operation costing (single unit or output and multiple), process costing, and some times batch costing are included.
These methods are discussed briefly.

Process costing:

This is suitable for industries manufacturing goods using a series of continuous or repetitive processes or operations. Many units of the same product are manufactured during a period. Examples: paper, soap, paint, textiles and chemicals. Under this method, costs are assigned to each process and the product cost assigned on an average basis.

Operation costing (One operation costing):

This is also known as unit or output costing. This is suitable for industries where manufacture is continuous and units are identical. Example: brick kilns, paper mills. Under this method, the entire production cycle is costed and the total accumulated cost is divided by the number of units produced to ascertain cost per unit.

Operation costing (Multiple operations costing):

This method of manufacture consists of a number of distinct operations. Usually this method refers to conversion cost—the cost of converting raw materials into finished goods.

Input units and cost are determined after taking into account the rejections in each operation. The cost per unit is ascertained with reference to final output.

Multiple costing:

This is also known as composite costing. This is suitable for industries where a number of component parts are produced separately but all are assembled in the final product. In such industries (e.g., cycle, radio, automobile), a combination of different costing methods are used. This method is not included in the terminology of CIMA, of late.

Service costing:

This is also known as operating costing. This is suitable for concerns which render services. Examples: transport, power, hospitals, canteens. This method is applied to ascertain the cost of services rendered. This is usually expressed in compound units.

Examples:

Transport → Tonne, kilometres
Power supply → Kilowatt-hour
Hospital → Patient day

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".

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

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.

Different industries follow different methods of costing because of the differences in the nature of their work. The various methods of costing are as follows:

1. Job Costing:

In this case the cost of each job is ascertained separately. It is suitable in all cases where work is undertaken on receiving a customer's order like a printing press, motor workshop, etc. In case a factory produces a certain quantity of a part at a time, say 5,000 rims of bicycle, the cost can be ascertained like that of a job. The name then given is Batch Costing.

2. Batch Costing:

It is the extension of job costing. A batch may represent a number of small orders passed through the factory in batch. Each batch here is treated as a unit of cost and thus separately costed. Here cost per unit is determined by dividing the cost of the batch by the number of units produced in the batch.

3. Contract Costing

Here the cost of each contract is ascertained separately. It is suitable for firms engaged in the construction of bridges, roads, buildings etc.

4. Single or Output Costing

Here the cost of a product is ascertained, the product being the only one produced like bricks, coals, etc.

5. Process Costing

Here the cost of completing each stage of work is ascertained, like cost of making pulp and cost of making paper from pulp. In mechanical operations, the cost of each operation may be ascertained separately; the name given is operation costing.

6. Operating Costing

It is used in the case of concerns rendering services like transport, supply of water, retail trade etc.

7. Multiple Costing

It is a combination of two or more methods of costing outlined above. Suppose a firm manufactures bicycles including its components; the parts will be costed by the system of job or batch costing but the cost of assembling the bicycle will be computed by the Single or output costing method. The whole system of costing is known as multiple costing.

Cost Units and Methods of Costing for Different Industries

Industry	*Cost Unit*	*Method of Costing*
1. Sugar	Quintal	Process
2. Chemicals	Kilogram	Process
3. Cement	Kg; tonne	Process
4. Timber	Cubic foot	Process
5. Confectionery	Kilogram	Process
6. Automobile	Number	Process
7. Soft drinks	Per bottle	Process
8. Oil Refinery	Per tonne—quintal	Process
9. Bicycle	Number	Multiple
10. Hospital	Per bed /per day or number of patients (OP)	Service
11. Transport	Tonne—km or Passenger km	Service
12. Advertising	Per ad	Job
13. Interior Decoration	Per job	Job
14. Garments	Number	Batch
15. Pharmaceutical	Per number	Batch

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 average40 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 %

Joint Products and Joint Product Costs:

Joint products are produced simultaneously by a common process or series of processes, with each product processing more than a nominal value in the form in which it is produced.

By Products:

The term "by product" is generally used to denote one or more products of relatively small total value that are produced simultaneously with a product of greater total value.

JOINT PRODUCTS AND BY-PRODUCTS

Joint products are products produced simultaneously by a common process or series of processes, with each product processing more than a nominal value in the form in which it is produced.

The term by-product is generally used to denote one or more products of relatively small total value that are produced simultaneously with a product of greater total value.

The meaning of joint products and by-products are as follows: Agricultural product industries, chemical process industries, sugar industries and extractive industries are some industries where two or more products of equal or unequal importance are produced either simultaneously or in the course of the processing operation of a main product.

In all such industries, managements are faced with problems such as valuation of inventory, pricing of products and income determination and problem of making decisions in matters of further processing of by-products and/or joint products after a certain stage.

Difficulties in costing by products and joint products

By products and joint products are difficult to cost because a true joint cost is indivisible. For example, an ore might contain both lead and Zink. In the raw state, these minerals are joint products, and until they are separated by reduction of the ore, the cost of finding mining and processing is a joint cost

I. General Characteristics of Joint Production

Joint products are two or more products produced simultaneously by the same process.

Joint products become separate and identifiable at the **split-off point**.

A. Cost Separability and the Need for Allocation

1. Joint costs are the total of the raw material, labor, and overhead costs incurred up to the initial split-off point.
    a. Joint costs can be allocated to the final product only in some arbitrary manner because such costs cannot be traced directly to the products they benefit.
    b. Joint cost allocation is performed to meet the requirements of financial reporting (GAAP) and federal income tax law for income measurement and inventory valuation. In addition, joint cost allocation is useful in costing for government cost-type contracts and in justifying prices for legislative or administrative regulations.
    c. Joint cost allocation is much less useful for cost control and managerial decision making.
2. **Separable costs** are those costs incurred after the split-off point; they can be easily traced to individual products.

B. Distinction and Similarity between Joint Products and By-Products

1. The distinction between joint products and by-products rests solely on the relative importance of their sales value.
2. A **by-product** is a secondary product whose total sales value is relatively minor in comparison with the sales value of the main product (joint product).
3. Relationships between joint products and by-products change over time as technology and markets change.
    a. By-products may become more and more important, eventually becoming joint products.

b. When the relative importance of individual products changes, the products need to be reclassified and the costing procedures need to be changed.

II. Accounting for Joint Product Costs

A. Introduction

1. Joint cost allocations must be done for financial reporting purposes: to value inventory and to determine income. An allocation method must be found, though arbitrary, to allocate the joint costs as reasonably as possible.
2. The joint cost allocation approaches include the following:
   a. Benefits-received approaches, which include the following methods:
      - Physical units method
      - Weighted average method
   b. Allocation based on the relative market value, using the following methods:
      - Sales-value-at-split-off method
      - Net realizable value method
      - Constant gross margin percentage method
      - Sales-to-production-ratio method

B. Benefits-Received Approaches

1. Physical Units Method

   a.Under the **physical units method**, units of physical output, such as heat content, volume, or weight, that measure the benefits received are used to distribute joint costs. This method allocates to each joint product the same proportion of joint costs as the underlying proportion of units.

      - Example: Manufacturers of forest products use the physical units method to apply the average conversion cost to all finished products, regardless of their type, grade, or market value.

   b. Disadvantages of the physical units method include the following:

- It ignores the fact that not all costs are directly related to physical quantities.
- It may result in incorrect managerial decisions because high profit may be reflected from the sale of high-grade products, with low profit or losses reflected from the sale of low-grade products.

2. Weighted Average Method

`The weighted average method uses the **weight factors** to include such diverse elements as amount of material used, difficulty to manufacture, time consumed, difference in type of labor used, and size of unit.

Weighted physical units = Number of units × Weight factor

- Example: The canning industry uses weight factors to distinguish between can sizes or quality of product. The weighted average method allocates relatively more of the joint cost to the high-grade products because they represent more desirable and profitable products.

C. Allocation Based on Relative Market Value

The methods in this approach try to assign costs based on the product's ability to absorb joint costs. They are based on the assumption that the joint costs would not be incurred unless the products yield enough revenues to cover all costs plus a reasonable profit.

The relative market value approach of allocation is better than the physical units approach if (1) the physical mix of output can be altered by incurring more (or less) total joint costs, and (2) this alteration produces more (or less) total market value.

1. Sales-Value-at-Split-Off Method

a. The **sales-value-at-split-off method** allocates joint cost based on each product's proportionate share of market or sales value at the split-off point.

b. In this method, the higher the market value, the greater the joint cost assigned to the product.

2. Net Realizable Value Method

a. The **net realizable value method** allocates joint costs based on **hypothetical sales values** because there may not be a ready market for the product at the split-off point.

b. This method is particularly useful when one or more products cannot be sold at the split-off point but must be processed further.

Hypothetical sales value = Market price – Further processing costs after split-off point

3. Constant Gross Margin Percentage Method

a. The **constant gross margin percentage method** allocates joint costs such that the gross margin percentage is the same for each product.

b. This method assumes that the further processing yields an identical profit percentage across all products.

c. Using the constant gross margin percentage method, the joint cost allocation steps include the following calculations:

$$\textbf{Grand gross margin percentage} = \frac{\textbf{(Total revenue} - \textbf{Total costs)}}{\textbf{Total revenue}}$$

Joint product gross margin = Market price × Grand gross margin

Joint cost allocated to product = Market value – Gross margin – Separable costs

4. Sales-to-Production Ratio

a. The **sales-to-production-ratio method** allocates joint costs in accordance with a weighting factor that compares the percentage of sales with the percentage of production.

b. In this method, the products that sell the most are allocated a larger share of the joint cost of current production.

c. Using the sales-to-production-ratio method, the joint cost allocation steps include:

(1) Compute the percentage of total sales based on the joint product units sold.

(2) Compute the percentage of total production based on the joint product units produced.

(3) Compute the sales-to-production ratio of the joint product.

$$\text{Sales-to-production ratio} = \frac{\text{Percentage of total sales}}{\text{Percentage of production}}$$

(4) Use the sales-to-production ratio to allocate joint cost.

5. The limitations of allocation based on relative market value include the following:

- All methods are based on price. If price is used to determine cost, then those costs cannot be used to determine price. The decision would be circular.
- Changes in relative market prices will cause changes in the costs allocated to the product, even when there has been no change in total costs or the method of production.
- Using allocation based on relative market value produces the same margin per dollar of allocated cost. This could be misleading to management if the impression is created that all products are equally profitable.

III. Accounting for By-Products

A. Introduction

1. The main objective of by-product accounting is to determine income and inventory for financial reporting purposes. By-products are of less

significance than the main products and may not require precise cost allocation.

2. Relevant factors that influence by-product valuation and accounting include:
   - The uncertainty of by-product value at the time of production.
   - The use of the by-product in other production.
   - The use of the by-product as an alternative to main products.
   - The need for separate profit calculations for sales incentives or for control.
3. By-products can be accounted for using the following:
   a. Non cost methods
      - Other income
      - By-product revenue deducted from main product cost
   b. Cost methods
      - Replacement cost method
      - Total costs less by-products valued at standard price method
      - Joint cost operation method

B. Non cost Methods of Accounting for By-Products

Non cost methods make no attempt to allocate joint cost to the by-product or its inventory but instead make some credit either to income or to the main product.

1. Other Income Method
   a. The net sales of by-products for the current period is recognized as "Other Income" or "Miscellaneous Income" and is reported in the income statement. The market value of by-product inventory, if material, should be reported in a footnote to the balance sheet.
   b. The other income method is used by those firms where:
      - The value of the by-product is small,

- Any other allocation would be more expensive than the benefits received, or
- Carrying by-products with the main products would not appreciably affect the cost of the main product.

c. Disadvantages of this method include the following:

- Inventories on the balance sheet are misstated since no value is placed on the by-products.
- Matching of revenues with expenses is improper if production of by-products occurs in one accounting period and sales occur in another. No entry for by-products is made at the time of production, only at the time of sale.
- No attempt is made to control the inventory of by-products and to prevent them from losses due to fraud or errors.

2. By-Product Revenue Deducted from Main Product Cost

a. The net sales of by-products will be treated as a deduction from the cost of the main product.

- Example: The beef-packing industry uses this method because of the great variety of products resulting from operations and the complexity of the processing.

b. Disadvantages of this method include the following:

- The method tends to understate the value of the main product.
- The cost of the main product can vary from month to month because of the varying quantities of by-products sold.

C. Cost Methods of Accounting for By-Products

Cost methods attempt to allocate some joint costs to by-products and to carry inventories at the allocated cost levels.

1. Replacement Cost Method

The **replacement cost method** values the by-product inventory at its opportunity cost of purchasing or replacing the by-products.

- Example: In the oil refining industry, increasing output of one product will cause a reduction in the output and the profit of the other product.

2. Total Costs Less By-Products Valued at Standard Price Method

a. By-products are valued at a standard price to avoid fluctuations in by-product value.

b. The standard price approach shelters the main product cost from any fluctuations in the by-product price.

c. The standard price may be set arbitrarily, or it may reflect an average price over time.

d. A variance account is used to account for the difference between actual and standard prices.

3. Joint Cost Proration Method

The by-product is allocated some portion of the joint costs using any one of the joint cost allocation methods mentioned in Section II. This method is rarely used in practice.

IV. Effect of Joint Product Costs on Cost Control and Decision Making

Joint product costing may affect cost control and decision making in the following areas: output decisions, further processing of joint products, and pricing jointly produced products**.**

A. Output Decisions

1. Output decisions are normally based on the comparison of total cost of the joint products and the combined sales revenues for measuring profitability at any given point.

2. If management cannot change the product mix or the product mix is determined by customer demand, cost allocation is useless for output decisions because the entire package has to be produced.

B. Further Processing Decisions

1. In making decisions on whether to sell a joint product at split-off or to process it further, only the costs and revenues incurred after the split-off point are pertinent.
2. Joint costs include those costs incurred prior to the split-off point and, thus, are considered sunk costs with respect to further processing decisions (that is, the joint cost is not a relevant cost).

C. Pricing Joint Products

Methods used to set joint product prices include:

1. Sales or market price method
   a. This method maintains a constant relationship of cost to market prices, but it cannot be used to set prices since price has to be known in order to determine cost.
   b. The method is circular but useful in limited situations.
      - Example: The meat-packing industry uses the market value of by-products as an important determinant of the main product's price.
      - Example: The natural gas industry uses it to justify prices and existing price relationships to regulatory bodies. Joint cost allocation is used to determine inventory values, not as a basis to determine a cost to be used in price regulation.
2. Historical market differentials between products method

   When market differentials are stable over time, this method provides a guide to pricing individual products by giving figures comparable to those of competitors.

D. Pricing Based on Cost of Further Production

This method differs from the benefits-received approaches because it does not assign average cost based on physical or weighted units. It is different from the relative market value because the joint product itself does not have a market value.

- Example: The practice of organ transplant sets the costs of the jointly available organs based on the eventual cost of the subsequent transplant operation.

V. Joint Production of Services

Normally services do not yield a true joint output because a service can be directed to one effect rather than to two effects simultaneously.

Joint cost allocation issues with services usually relate to pricing problems.

- Example: An insurance company may allow only a portion of a massage therapy charge to be allocated to the therapeutic aspect.
- Example: The IRS might allow the cost of a two-day seminar as a deductible business expense. But if the seminar were offered on a cruise ship and spread out over a five-day period, the IRS would look closely if claimed as a deduction and not separated from the overall cost of the cruise.

Methods of Allocating the Joint Production Cost:

The allocation of joint product cost incurred up to the split-off point can be made by:

1. The market or sales value method, based on the relative market values of the individual products.
2. The quantitative or physical unit method, based on some physical measurement unit such as weight, linear measure, or volume.
3. The average unit cost method.
4. The weighted average method, based on a predetermined standard or index of production.

Joint Product Cost Analysis for Managerial Decisions and Profitability Analysis:

Get information about how managerial decisions are affected by joint production costs and methods used to allocate joint costs.

POSSIBLE QUESTIONS

PART A (ONE MARKS – ONLINE EXAMINATION)

PART B (2 MARKS)

1. Write any 4 features of Job Costing
2. Define Process Costing
3. Define the term 'contract costing'.
4. What is a job order costing?
5. Define contract costing.
6. Write a short note on Service costing.
7. Write any 4 service sectors
8. Explain Job Costing.\

PART C (6 MARKS)

1) Neo Pharma processes a product through three distinct stages the product of one process being passed on the next process and so on to the finished product intact. Details of the cost incurred in each process are given below:

	Process A	Process B	Process C
	Rs.	Rs.	Rs.
Raw Materials	1,150	1,050	700
Direct wages	500	600	700

The overhead expense for the period amounted to Rs.3, 600 and is to distributed to the processes on the basis of direct wages. There were no stocks in any of the processes either at the beginning or at the close of the period.Assuming the output was 1,000 kilos show the process cost of A,B and C indicating also the cost per kilo of each element of cost and the output in each process.

2) From the following information, calculate total kilometers and total passenger kilometers:

Number of Buses	:	10
Days operated in the month	:	25
Trips made by each bus	:	4
Distance of route	:	20 Km. (one side)
Capacity of Bus	:	40 Passengers
Normal Passenger Travelling	:	90 % of capacity

3) The following are the expenses on a contract for Rs. 6,00,000 which commences on 1st Jan. 2003

Materials	1,20,000
Wages	1,64,400
Plant	20,000
Business Charges	8,66

Cash Received on account to 31st Dec,2003 amounted to Rs 2,40,000 being 80% of work certified; the value of material in hand on 31-12-03 was Rs.10,000. Prepare the contract account for 2003 showing the profit to be credited to the year's Profit and Loss Account. Plant is to be depreciated at 10%.

4) The account of pleasant Company Ltd show for 2017

Materials Rs.3,50,000 : Labour Rs, 2,70,000 ; Factory Overheads Rs 81,000 and Administration Overheads Rs. 56,080.

What Price should the company quote for a refrigerator? It is estimated that Rs.1,000 in material and Rs. 700 in labour will be required for refrigerator. Absorb factory overheads on the basis of labour and administration overheads on the basis of work cost. A profit of 12.5% on selling price is required.

5) What are the advantages and weaknesses of job order cost accounting?

6) A Particular brand of phenyl passed through three important processes. During the week ended 15th January, 600 gross bottles were produced. The cost book shows the following information :

Particulars	Process A (Rs.)	Process B (Rs.)	Process C (Rs.)
Materials	4,000	2,000	1,500
Labour	3,000	2,500	2,300
Direct Expenses	6,000	200	500
Cost of Bottles	Nil	2,030	Nil
Cost of Corks	Nil	Nil	325

The indirect expenses for the period were Rs. 1,600

The by – products were sold for Rs. 240 (Process B)

The residue was sold for Rs. 125.50 (Process C)

Prepare the account in respect of each of the process, showing its cost and cost of production of the finished product per gross bottles.

7) Describe briefly the main features of process costing. Name the industries where process costing can be applied

8) Jain and company obtained a contract for the building of an office for Rs. 3,00,000.

Building operations started on 1st April 2003 and at the end of the financial year i.e. 31st

March 2004, they received from the party a sum of Rs. 1,20,000 being 80 % of the amount of the surveyors certificate. The following additional information are available

from the books of Jain and Company:

	Rs.
Stores issued to contract	60,000
Stores on hand as on 31st March 2004	5,000
Wages Paid	82,000
Plant for the contract work	10,000
Direct Expenses	4,300
Depreciation plant by 10 %	

You are required to prepare an account showing profit on contract up to 31st March 2004. Also discuss whether Jain and Company would be justified in taking the full amount of this profit to the credit of their Profit and Loss Account.

Reg No……

16CCU401

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed University Established Under Section 3 of UGC Act 1956)

COIMBATORE- 641021

(For the candidates admitted from 2016 onwards)

First Internal Examination – September 2017

B.COM CA - FOURTH SEMESTER

COST ACCOUNTING

Time : 2 HOURS **Maximum: 50 Marks**

Date :

PART – A (20*1= 20 Marks)

Multiple choice Questions

1. Cost accounting has become an essential tool of _____

a) Accounts b) **Management** c) Purchase d) Sales

2. Factory Cost=

a) Direct Material

b) Factory cost+ administrative Over head

c) Cost of production+ selling and distributive over head

d) prime cost+ factory over head

3**.** _____cost are those cost which are incurred to maintain the earning capacity of the business

a) Capital Cost b) Revenue Cost c) Fixed Cost d) Variable Cost

4**.** _____Cost which continue to occur even if there is temporary stoppage of production activities

a) Unavoidable cost b) Avoidable Cost c) Capital Cost d) Revenue Cost

5. Expenses may be

a) direct b) indirect **c) both** d) only in direct

6. _____costing refers to same costing principles and methods

a) historical costing b) direct costing c) indirect costing **d) uniform costing**

7. Direct costing is the ---------- of direct cost in respect of a product

a) ascertainment b) analyzing c) reporting d) recording

8. Cost accounting facilitates cost Reduction and

a) Cost b) Control **c) Cost Control** d) Overheads

9. _____is followed by industries which render services

a) batch costing b) process costing c) unit costing **d) operating costing**

10. Extension of job costing is known as

a) contract b) batch **c) process** d) unit

11. _____cost is one of the most important elements of the cost of production

a) Labour **b) Material** c) Selling Overhead d) Administrative Overhead

12.Inventory means

a) Stock b) Material c) Stores d) Sales

13. BIN card is maintained by

a) Storekeeper b) Accountant c) Auditor d) Supervisor

14. EOQ =

a) √AO/C b) √AC/O **c) √2AO/C** d) √2CA/C

15. _____level below which stock level should not be allowed to fall at any time

a) Minimum b) Maximum c) Re- Order level d) Average

16. _____gives the complete list of materials required for a particular job or work order

a) job costing b) process costing c) unit costing d) contract costing

17. _____is attached to each bin to show the position of stock in the bin

a) bin card b) stores ledger c) bill of material d) stock transfer note

18. _____is known as automatic inventory system

a)perpetual inventory b) stores ledger

c) bill of material d) stock transfer note

19. An _____ system of material control will lead to a significant reduction in total cost of production

a) Poor b) Better **c) Efficient** d) good

20. _____ helps to prevent over stocking of materials

a) **Material control** b) material transfer note c) BIN card d) Stores ledger

PART – B (3*2= 6 Marks)

Answer all the Questions

21. Prepare the chart showing Element of Cost?

Answer Key

- Material
- Labour
- Other Expenses
- Overheads
    - Production Overheads
    - Administration Overheads
    - Selling Overheads
    - Distribution Overheads

22. In a company weekly minimum and maximum consumption of material A are 25 and 75 units respectively. The re-order quantity as fixed by the company is 300 units. The material is received within 4 to 6 weeks from issue of supply order. Calculate minimum and maximum level of material A.

Answer Key

Average Consumption = 50 units

Average Period = 5 weeks

Minimum Level = 200 Units

Maximum Level =650 Units

23. Find out the economic ordering quantity (E.O.Q) from the following particulars:

Annual usage : Rs. 1,20,000

Cost of placing and receiving one order : Rs.60

Annual carrying cost : 10% of inventory value.

Answer Key

E.O.Q = Rs. 12,000

PART – C (3*6= 24 Marks)

Answer all the Questions

24. a) State and explain the main differences between financial accounting and cost accounting?

Answer Key

- Purpose
- Forms of Accounting
- Recording
- Control
- Periodicity of Reporting
- Analysis of Profit
- Reporting of Cost
- Information
- Nature of Transaction
- Stock valuation

(OR)

b) Calculate Prime Cost, Factory cost, Cost of production, Cost of sales and Profit from the following

particulars:

Direct Materials	1,00,000	Depreciation	
Direct Wages	30,000	Factory Plant	500
Wages of foreman	2,500	Office Premises	1250
Electric Power	500	Consumable Stores	2500
Lighting :		Manager's salary	5000
Factory	1,500	Director's fees	1,250
Office	500	Office Stationery	500
Storekeeper's wages	1,000	Telephone Charges	125
Oil and Water	500	Postage and Telegrams	250
Rent:		Salesman salaries	1250
Factory	5,000	Travelling expenses	500
Office	2,500	Advertising	1250
Repairs And Renewals		Warehouse Charges	500

Factory Plant	3,500	Sales	1,89,500
Office Premises	500	Carriage Outward	375
Transfer to Reserves	1,000	Income Tax	10,000
Discount on shares written off	500		
Dividend	2,000		

Answer Key

- Prime Cost = Rs.1,30,000
- Factory Cost = 1,47,500
- Cost of Production = 1,59,375
- Cost of Sales = 1,63,250
- Profit = 26,250

25.a) The following information has been obtained from the records of left-centre corporation for the period from January 1 to June 30, 2006:

	2006 on jan 1	2006 on june 30	
Cost of raw material	30,000	25,000	
Cost of work in progress	12,000	15,000	
cost of stock of finished goods	60,000	55,000	
Transactions during six months are			
Purchase of raw material	4,50,000	Administration Overheads	30,000
Wages paid	2,30,000	Selling and Distribution Overheads	20,000
Factory overheads	92,000	Sales	9,00,000

Prepare

i) Cost sheet showing: a) material consumed; b) prime cost; c) factory cost incurred and factory cost; and

ii) Income statement in traditional form for the six months showing gross profit and net profit.

Answer Key

- Cost of Material Consumed = 4,55,000
- Prime Cost = 6,85,000
- Factory or Manufacturing Cost = 7,74,000
- Net Profit = 71,000

(OR)

b)Compute the i) re-order level; ii) minimum level; iii) maximum level; and iv) average stock level for components A and B based on the following data:

	A	B
Maximum consumption per week (in units)	150	150
average consumption per weeks (in units)	100	100
minimum consumption per week (in units)	50	50
Re-order period (in weeks)	8 to 12	4 to 8
re-order quantity (in units)	400	600

Answer Key

- Re – Order Level (A = 1800 Units, B = 1200 Units)
- Minimum Level (A= 800 Units, B = 600 Units)
- Maximum Level (A = 1800 Units, B = 1600 Units)
- Average Stock Level (A = 1000 Units, B = 900 units)

25. a) The "received" side of the stores ledger account shows the following particulars:

Jan. 1	opening balance	500 units @ Rs.4
Jan. 5	Received from vendor:	200 units @ Rs. 4.25
Jan.12	Received from vendor:	150units @ Rs. 4.10
Jan.20	Received from vendor:	300 units @Rs. 4.50
Jan.25	Received from vendor:	400 units @Rs. 4.00

Issues of material were as follows:

Jan. 4 – 200 units: Jan.10- 400 units: Jan 15 -100 units; Jan.19- 100 units: Jan.26-200 units; Jan. 30- 250 units.

Issues are to be priced on the principle of "First In First Out". Write out the stores ledger account in respect of the materials for the month of January.

Answer Key

- Balance: Quantity = 300
- Unit Cost = 4
- Total cost = 1200

(OR)

b) The following transaction occur in the purchase and issue of a material:

Jan . 2 purchased 4000units @ Rs.4.00 per unit

Jan. 20 purchased 500 units @ Rs. 5.00 per unit

Feb 5 issued 2,000 units

Feb 10 purchased 6,000 units @ Rs.6.00 per unit

Feb 12 issued 4,000 units

March 2 issued 1,000 units

March 5 issued 2,000 units

March 15 purchased 4,500units @ Rs.5.50 per unit

March 20 issued 3,000 units

From the above table prepare stores ledger account.

By adopting the LIFO method, what would be the value of stock in hand at the end of the period according to each of these two methods?

Answer Key:

- Balance: Quantity = 3000
- Unit Cost = 5.50
- Total cost = 16,500