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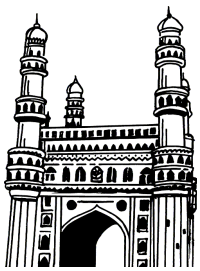

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COST ACCOUNTING

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Ans : **(Dec.-18)**

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Ans : **(Imp.)**

Refer Unit-II, Q.No. 7.

4. From the following particulars, prepare stores Ledger by using FIFO method.

Jan 1 Opening Balance 500 units @ 4 Rs. per unit
Jan 5 Received from Vendor 200 units @ 4.25 Rs. per unit
Jan 12 Received from Vendor 150 units @ 4.10 Rs. per unit
Jan 20 Received from Vendor 300 units @ 4.50 Rs. per unit
Jan 25 Received from Vendor 400 units @ 4.00 Rs. per unit
Issue of Materials
Jan. 4 – 200 units, Jan. 10th – 400 units
Jan. 15 – 100 units, Jan. 19th – 100 units
Jan. 26 – 200 units, Jan. 30th – 250 units

Ans : **(Dec.-18)**

Refer Unit-II, Prob. 11.

5. The following transactions occur in the Purchases and issue of materials

	Purchases	Issues
March 1st	200 Units (5) Rs. 10 each	March 20th 160 Units
March 4th	50 Units @ Rs. 10.50 each	March 27th 160 Units
March 15th	100 Units (5) Rs. 11.00 each	March 30th 100 Units
March 22nd	100 Units @ Rs. 11.00 each	
March 26th	100 Units @ Rs. 11.50 each	

Prepare the Stock Account showing the Balance on March 31st by using LIFO method.

Ans : **(July-21)**

Refer Unit-II, Prob. 19.

6. Prepare the Stores Ledger from the following transaction adopting the Weighted Average Method of Pricing out issues.

1st July Opening Balance 100 Units @ Rs. 6 per Unit

5th July Purchased 96 Units @ Rs.8 per Unit

7th July Issued out to Production 4 Units

9th July Issued out 40 Units to Production

19th July Purchased 152 Units @ 6 per Unit

25th July Received back into Stores 38 Units out of 40 Units issued on 9th July

28th July Issued to Production 20 Units.

Ans : **(July-21)**

Refer Unit-II, Prob. 24.

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1. Discuss briefly about labour turnover ?

Ans : **(July-19, Imp.)**

Refer Unit-III, Q.No. 2.

2. Define overheads. State the classification of overheads ?

Ans : **(July-21, Dec.-18, Imp.)**

Refer Unit-III, Q.No. 5.

3. Explain briefly about allocation and apportionment of overheads and the bases for both allocation and apportionment.

Ans : **(Imp.)**

Refer Unit-III, Q.No. 6.

4. What do you understand by reapportionment ? Write about the basis and various methods of reapportionment ?

Ans : **(Imp.)**

Refer Unit-III, Q.No. 7.

5. Apportion the overheads among the Department A, B, C & D

Particulars	Rs.
Works Manager Salary	4,000
Power	21,000
P. F.	9,000
Plant Maintenance	4,000
Depreciation	20,000
Canteen Expenses	12,000
Rent	6,000

Additional Information :

Particulars	A	B	C	D
No. of Employees	16	8	4	4
Area Occupied (SFT)	2,000	3000	500	500
Plant (Rs.)	75,000	1,00,000	25,000	–
Wages (Rs.)	40,000	20,000	10,000	5,000
H.P.	3	3	1	–

Ans : **(Dec.-18)**

Refer Unit-III, Prob. 26.

6. A Company has three Production Departments and two Service Departments and for the year 2017, the departmental distribution summary has the following totals.

Production Departments:	
A ` 30,000, B ` 20,000 and C ` 10,000	**` 60,000**
Service Departments:	
X ` 5,850, Y ` 7,500	**` 13,350**
Total	**` 73,350**

The expenses of the Service Departments are charged out on a percentage basis as follows:

Particulars	A	B	C	X	Y
Service Department X	30%	40%	20%	–	10%
Service Department Y	20%	20%	40%	20%	–

Prepare a statement showing the apportionment of two Service Departments expenses to Production Departments by simultaneous Equation Method and Repeated Distribution Methods.

Ans : **(Dec.-18 (KU))**

Refer Unit-III, Prob. 31.

7. What do you mean by machine hour rate ? How to calculate machine hour rate?

Ans : **(Imp.)**

Refer Unit-III, Q.No. 8.

8. Compute the Machine Hour Rate from the following data. Cost of the Machine Rs.2,00,000, Installation Charges Rs.20,000, Estimated Scrap Value after Expiry of its life of 15 years Rs. 10,000. Rent and Rates of the Shop per month Rs.400, General Lighting Rs.600 p.m. for the shop. Shop Supervisor's Salary Rs.1,200 p.m., Insurance Premium for the Machine Rs.1,920 p.a., Estimated Repairs and Maintenance Rs.2,000 p.a., Power Consumption of the Machine: 10 Units per hour, at Rs.40 per 100 Units. Estimated working hours of the Machine per year (including set up time of 200 hours): 2,200. The machine occupies 'A of the total floor area of the shop. The Supervisor of the shop devotes 1 /5th of his time for Supervising the Machine.

Ans : **(July-21)**

Refer Unit-III, Prob. 32

UNIT - IV

1. In a factory two types of articles are produced viz., A and B. From the following particulars prepare a Statement of Cost showing Total Cost of each variety and ascertain the Total profit.

	A	B
Materials	**60,000**	**1,00,000**
Wages	**1,20,000**	**1,40,000**

Works on Cost is charged at 40% of Works Cost and Office on Cost is taken at 20% on Total Cost. Article 'A' sold during the period are 180 at Rs. 2,400 each and Article of B' sold are 200 at Rs. 3,000 each.

Ans : **(July-21)**

Refer Unit-IV, Prob. 12.

2. Explain briefly about purpose of preparing estimated cost sheet for tenders?

Ans : **(Imp.)**

Refer Unit-IV, Q.No. 4.

3. Following information is from manufacturing account of a Factory, for the year ending 31-12-1980.

Material Consumed	**Rs. 6,00,000**
Wages	**Rs. 4,00,000**
Factory Expenses	**Rs. 2,40,000**
Office Expenses	**Rs.1,55,000**

During 1981, the factory received a request from customer for quotation, which estimated Material Rs. 40,000 and Wages Rs. 30,000. What should be the quotation if the factory desires to make a profit 25% on Selling Price?

Ans : **(Dec.-18)**

Refer Unit-IV, Prob. 20.

4. Define job costing? Explain the features.

Ans : **(Dec.-19, Dec.-18, July-19)**

Refer Unit-IV, Q.No. 5.

5. Explain the advantages of Job costing.

Ans : **(Dec.-18)**

Refer Unit-IV, Q.No. 6.

6. The following particulars relate to Job No. 323

Materials used Rs. 500

Direct Wages

X 10 hours @ 2.50 per hour

Y 8 hours @ 3.00 per hour

Z 5 hours @ 4.00 per hour

Variable Overheads

X 7000 labour hours Rs. 7,000

Y 3000 labour hours Rs. 6,000

Z 1000 labour hours Rs. 4,000

Fixed overheads Rs. 30,000 for 7500 working hours. You are required to calculate the Cost of Job No. 323 and calculate the Price to give the profit of 33 on Selling Price.

Ans : **(July-19)**

Refer Unit-IV, Prob. 27.

7. Following information extracted from costing records of a company, in respect to

Job No : 100

Material : Rs. 4000

Wages :

A 80 hours @ Rs. 4 per hour

B 70 hours @ Rs. 3 per hour

C 50 hours @ Rs. 5 per hour

Factory overheads :

A Rs. 8000 for 8000 hours

B Rs. 4000 for 2000 hours

C Rs. 2000 for 1000 hours

Fixed overheads : Rs. 9000 for 9000 hours

your are required to calculate the price to be changed so on to give a profit of 20% on selling price.

Ans : **(Dec.-18)**

Refer Unit-IV, Prob. 28.

UNIT - V

1. Prepare Contract Account from the information given below:

Particulars	1988-89 Rs	1989-90 Rs
Materials	3,00,000	84,000
Wages	2,30,000	1,05,000
Expenses	35,000	15,400
Materials at end	13,000	7,000
Cash received	6,00,000	10,00,000
Certified Completion of Work	75%	100%

Ans : **(July-19)**

Refer Unit-V, Prob. 11.

2. From the following information prepare

a) The Contract Accounts

b) Contractee's Accounts

Materials sent to site	85,349
Labour engaged on site	74,375
Plant installed at cost	15,000
Direct Expenditures	4,126
Establishment charges	3,167
Materials returned to stores	549
Work Certified	1,95,000
Cost of work not certified	4,500
Material on hand, Dec. 31	1,883
Wages accrued on Dec. 31	2,400
Direct expenses accrued on 31st Dec.	240
Value of plant on Dec. 31st	11,000

The contract price has been agreed at ` 2,50,000. Cash has been received from the contractee amounting to ` 1.80,000.

Ans : **(Dec.-19)**

Refer Unit-V, Prob. 12.

3. What is process costing? Explain the characteristics of process costing.

Ans : **(July-19, Dec.-18)**

Refer Unit-V, Q.No. 6.

4. Explain advantages and disadvantages of process costing?

Ans : **(Dec.-18)**

Refer Unit-V, Q.No. 7.

5. Make out the necessary Accounts from the following details:-

Particulars	Process A	Process B
Materials	Rs. 60,000	Rs. 6,000
Labour	Rs. 20,000	Rs. 24,000
Overheads	Rs. 14,000	Rs. 17,200
Inputs (Units)	20,000	17,500
Normal Loss	10%	4%
Sale Value of Wastage per Unit	Rs. 1	Rs. 2

There was no Opening or Closing Stock or Work in Progress Final Output from Process 'B' was 17,000 Units.

Ans : **(July-21)**

Refer Unit-V, Prob. 24.

6. The product of a Manufacturing concern passes through two process A and B then to Finished product.

Each process normally has 5% loss in weight and 10% is scrap which from A and B realises Rs. 80 per kg and Rs. 200 per kg. respectively.

Following are the figures relating to two process :

Particulars	Process - A	Process - B
Material in kgs	1000	70
Cost of the Material (Rs) per kg	125	200
Wages (Rs.)	28000	10,000
Expenses (Rs.)	8000	5250
Output in kgs	830	780

Prepare process accounts showing Cost per kg of each process.

Ans : **(Dec.-18)**

Refer Unit-V, Prob. 27.

7. A product passes through three stages of production and the product of each stage becomes the raw materials of the next stage. Further raw materials are also added at each stage. During March 2014, 2000 units of finish product were produced with the following expenditure.

Particulars	Stage-A	Stage-B	Stage-C
Materials	20,000	16,000	8,000
Labour	16,000	24,000	12,000
Direct expenses	1,200	2,000	800

Indirect expenses amounted to ` 2,600. It is to be apportioned on the basis of labour. Main raw issued to stage (besides above) was worth ` 12,000. Prepare the process cost accounts.

Ans : **(Dec.-18 (MGU))**

Refer Unit-V, Prob. 28.

UNIT I

INTRODUCTION

Cost Accounting: Definition – Features – Objectives – Functions – Scope – Advantages and Limitations - Essentials of a good cost accounting system– Difference between Cost Accounting and Financial Accounting – Cost concepts– Cost Classification.

1.1 Cost Accounting

1.1.1 Definition

Q1. Define cost accounting.

(OR)

What is cost accounting?

Ans : **(July-19, Dec.-19, Dec.-18)**

Meaning

Cost accounting has primarily developed to meet the needs of management. Profit and Loss Account and Balance Sheet are presented to management by the financial accountant. But modern management needs much more detailed information than supplied by these financial statements. Cost accounting provides detailed cost information to various levels of management for efficient performance of their functions. The information supplied by cost accounting acts as a tool of management for making optimum use of scarce resources and ultimately add to the profitability of business.

Costing

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

Definitions

i) The Chartered Institute of Management Accountants (CIMA) of UK has defined costing as, "the techniques and processes of ascertaining costs".

ii) Wheldon has defined costing as, "the classifying. recording and appropriate allocation of expenditure for the determination of costs, the relation of these costs to sales value and the ascertainment of profitability. "Thus, costing simply means cost finding by any process or technique. It consists of principles and rules which are used for determining :

(a) the cost of manufacturing a product, e.g., motor car, furniture, chemical, steel, paper, etc and

(b) the cost of providing a service; e.g., electricity, transport, education, etc.

Cost Accounting

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

Definitions

i) An authoritative definition of cost accounting has been given by CIMA of UK as follows : "Cost accounting is the process of accounting for costs from the point at which expenditure is incurred or committed to the establishment of its ultimate relationship with cost centres and cost units. In its widest usage, it embraces the preparation of statistical data, the application of cost control methods and ascertainment of profitability of activities carried out or planned".

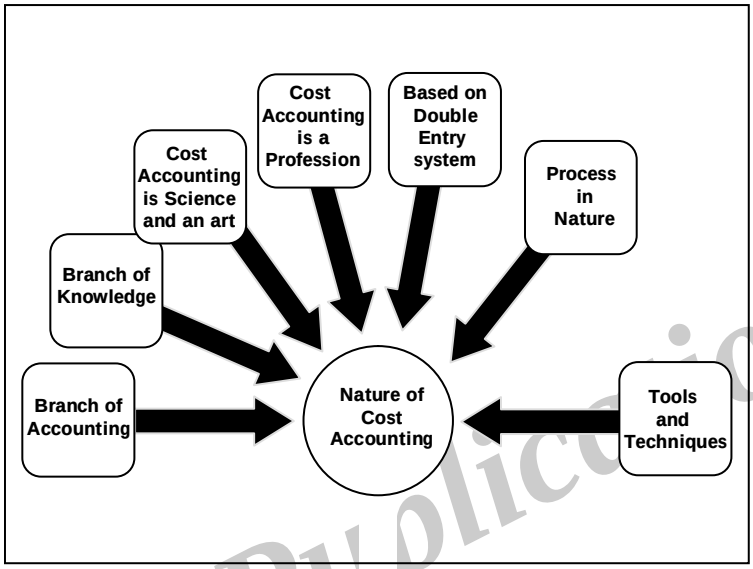
ii) According to Mr. Wheldon defines cost accounting as "The classifying, recording and appropriate allocation of expenditure for the determination of cost of products or services. The relation of these cost to sale value and the ascertainment of profitability.

iii) According to Kohler, "Cost accounting deals with the classification, recording, allocation, summariation and reporting of current and prospective costs".

Q2. Explain the nature of cost accounting.

Ans : **(July-21)**

Cost Accounting is an art or process of recording, analyzing and classifying of expenditure for the purpose of product costing or service costing, ascertainment of profitability, operational planning and cost control. It is a forward looking approach which is related to the recording, analyzing and classifying of expenditure with the objective of ascertaining the total and per unit cost of product or service. The following points are the nature of cost accounting.



1. Branch of Accounting

Cost Accounting is a branch of accounting that deals specifically with the determination of costs of the products and services being manufactured. It deals with those techniques, tools, processes and methods which are associated with the determination of costs, their classification and analysis. It is an accounting which is done internally to the organization and is optional.

2. Branch of Knowledge

It is an important branch of knowledge and emerges as a discipline in itself. It is an organize body of knowledge which has its own tools and techniques like

- Job costing
- Process costing
- Standard costing
- Marginal costing
- Variance analysis
- Unit costing
- Batch costing
- Activity based costing
- Budgetary control
- Contract costing etc.

3. Cost accounting is Science and an Art

Cost accounting is both science and an art but not a perfect science.

It is science as it is a body of systematic knowledge relating to not only accounting but also to a wide variety of subjects such as law, office practices, data processing, production and material control etc.

It is an art as it involves the use of the skills and experience of cost accountant in collection, classification and analysis of the costs of the products.

4. Cost Accounting is a Profession

Cost accounting is not a pure profession by nature but it is emerging as a profession. The set up of various specialized institutions like

- Institute of cost and management accountants in UK
- Institute of cost and work accountants in India
- Is a way long to make cost accounting as a profession.

5. Based on Double Entry System

Cost accounting is based on the double entry system. It is follows the rule of 'every debit has equal credit.' All transactions that are recorded in the cost accounting records have two fold aspect.

6. A Process in Nature

Cost accounting is a process in nature. It is a process that involves the following steps:

- Identification of costs
- Recording of costs
- Classification of costs
- Analyzing the costs
- Interpreting the results
- Communicating the results to the management.

It is a forward looking approach that aims at improving the efficiency of the manufacturing activities.

7. Tools and Techniques

Cost accounting has its own tools and techniques of standard costing and variance analysis, contract costing, process costing, job costing, unit costing, batch costing, marginal costing etc. cost accounting make use of such techniques in preparing the accounting records with full accuracy and also fix the standards of performance for future.

1.1.2 Features

Q3. Explain the features of cost accounting.

Ans :

The important features of Cost Accounting are stated below:

(a) It is a process of accounting to determine costs.

(b) It records incomes and expenditures, incurred for manufacturing prowl and rendering services.

(c) It provides statistical data for preparing estimates and submitting quotations.

(d) It is the basis to ascertain and control costs.

(e) It evaluates efficiency by comparing actual performance with the stander performance fixed for the purpose.

(f) It involves recording, analysis, comparison and reporting of co, information for day-to-day managerial decision.

1.1.3 Objectives

Q4. Explain the objectives of cost accounting.

Ans : **(Dec.-19)**

The main objectives of cost accounting are as follows:

1. Ascertainment of cost

This is the primary objective of cost accounting. For cost ascertainment different techniques and systems of costing are used under different circumstances.

2. Control of cost

Cost accounting aims at improving efficiency by controlling and reducing cost. This objective is becoming increasingly important because of growing competition.

3. Guide to business policy

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

4. Determination of selling price

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

5. Measuring and improving performance

Cost accounting measures efficiency by classifying and analyzing cost data and then suggest various steps in improving performance so that profitability is in-creased.

1.1.4 Functions & Scope

Q5. Explain the functions and scope of cost accounting.

(OR)

State briefly the scope of cost accoun-ting.

Ans : **(July-21, Dec.-19, Dec.-18)**

Scope

1. Cost Ascertainment

It deals with the collection and analysis of expenses, the measurement of production of the different products at the different stages of manufacture and the linking up of production with the expenses. In fact, the varying procedures for the collection of expenses give rise to the different systems of costing as Historical or Actual costs, Estimated Costs, Standard Costs etc. Again the varying procedures for the measurement of production have resulted in different methods of costing such as Specific Order Costing, Operation Costing etc. For linking up of production with the expenses the different techniques of costing such as Marginal Cost Technique, the Total Cost Technique, Direct Cost Technique etc. have been evolved. All the three *i.e.* systems, methods and techniques can be used in one concern simultaneously.

2. Cost Accounting

It is the process of accounting for cost which begins with recording of expenditure and ends with the preparation of statistical data, it is formal mechanism by means of which costs of products or services are ascertained and controlled. Cost accounting is helpful to the management in decision making. Decision making requires, apart from other information, cost information which is provided by cost accounting. Cost can be ascertained either by following the historical or predetermined system of costing. Cost can be predetermined either by standard costing or estimated costing. If the cost and financial accounts are kept separately then their reconciliation is also to be done in order to verify the accuracy of both sets of accounts.

3. Cost Control

Cost Control is the guidance and regulation by executive action of the costs of operating an undertaking. It aims at *guiding* the actual towards the line of targets ; *regulates* the actuals if they deviate or vary from the targets ; this guidance and regulation is done by an *executive* action. The cost can be controlled by standard costing, budgetary control, proper presentation and reporting of cost data and cost audit.

4. Cost Reduction

It is a planned positive approach to reduce expenditure. It is a corrective function by continuous process of analysis of costs, functions etc. For further economy in application of factors of production.

5. Cost Audit

Cost Audit is the verification of the correctness of cost accounts and a check on the adherence to the cost accounting plan. Its purpose is not only to ensure that cost accounts and other records are arithmetically correct but also to see that the principles and rules have been applied correctly.

Functions

(i) To work out cost per unit of the different products manufactured by the organization;

(ii) To provide an accurate analysis of this cost;

(iii) To maintain costs to the lowest point consistent with the most efficient operating conditions. It requires the examination of each cost in the light of the service or benefit obtained so that the maximum utilization of each rupee will be obtained;

(iv) To work out the wastage in each process of manufacture and to prepare reports as may be necessary to assist in the control of wastage;

(v) To provide necessary data for the fixation of selling price of commodities manufactured;

(vi) To compute profits earned on each of the products and to advise management as to how these profits can be improved;

(vii) To help management in control of inventory so that there may be minimum locking up of capital in stocks of raw materials, stores, work-in-process and finished goods

(viii) To install and implement cost control systems like Budgetary Control and Standard Costing for the control of expenditure on materials, labour and overheads;

1.1.5 Advantages and Limitations

Q6. Explain the merits of cost accounting.

(OR)

Explain the advantages of cost accounting.

Ans : **(July-19)**

A) Advantages to Management

1. Reveals profitable and unprofitable activities: A system of cost accounting reveals profitable and unprofitable activities. On this information, management may take steps to reduce or eliminate wastages and inefficiencies occurring in any form such as idle time, under-utilisation of plant capacity, spoilage of materials, etc.

2. **Helps in cost control:** Cost accounting helps in controlling costs with special techniques like standard costing and budgetary control.
3. **Helps in decision making:** It supplies suitable cost data and other related informa-tion for managerial decision making, such as introduction of a new product line, determining export price of products, make or buy, etc.
4. **Guides in fixing selling prices:** Cost is one of the most important factors to be considered while fixing prices. A system of cost accounting guides the management in the fixation of selling prices, particularly during depression period when prices may have to be fixed below cost.
5. **Helps in inventory control:** Perpetual inventory system, which is an integral part of cost account-ing. helps in the preparation of interim profit and loss account. Other inventory control techniques like ABC analysis, level setting, etc., are also used in cost accounting.
6. **Aids in formulating policies:** Costing provides such information as enables the management to formulate production and pricing policies and preparing estimates of contracts and tenders.
7. **Helps in cost reduction:** It helps in the introduction of a cost reduction programme and finding out new and improved ways to reduce costs.
8. **Reveals idle capacity:** A concern may not be working to full capacity due to reasons such as shortage of demand, machine breakdown or other bottlenecks in produc-tion. A cost accounting system can easily work out the cost of idle capacity so that management may take immediate steps to improve the position.
9. **Checks the accuracy of financial accounts:** Cost accounting provides a reliable check on the accuracy of financial accounts with the help of reconciliation between the two at the end of the accounting period.
10. **Prevents frauds and manipulation:** Cost audit system, which is a part of cost accoun-tancy, helps in preventing manipulation and frauds and thus reliable cost data can be furnished to management and others.

B) Advantages to Workers

Workers are benefited by introduction of incentive plans which is an integral part of a cost system. This results not only in higher productivity but also higher earnings for workers.

C) Advantages to Society

An efficient cost system is bound to lower the cost of production, the benefits of which are passed on to the public at large in the form of lower prices of products and services.

D) Advantages to Government Agencies and Others

A cost system produces ready figures for use by government, wage tribunals, trade unions, etc., for use in problems like price fixing, wage level fixation, settlement of industrial disputes, etc.

Q7. Explain the demerits of cost accounting.

(OR)

What are the limitations of cost accounting?

Ans : **(July-21, July-19)**

1. **It is unnecessary:** It is argued that mainte-nance of cost records is not necessary and involves duplication of work. It is based on the premise that a good number of concerns are functioning prosperously without any system of costing. This may be true, but in the present world of competition,

to conduct a business with utmost efficiency, the management needs to know detailed cost information for its decision-making. Only a cost accounting system can serve this need of the management and thus help in the more efficient conduct of a business.

2. **It is expensive:** It is pointed out that instal-lation of a costing system is quite expensive which only large concerns can afford. It is also argued that installation of the system will involve additional expendi-ture which will lead to a diminution of profits. In this respect, it may be said that a costing system should be treated as an investment and the benefits derived from the system must exceed the amount spent on it. It should not prove a burden on the finances of the company.

3. **It is inapplicable:** Another argument some-times put forward is that modern methods of costing are not applicable to many types of industry. This plea is not very apt. The fault lies in an attempt to introduce a readymade costing system in a firm. A costing system must be specially designed to meet the needs of a business. Only then the system will work successfully and achieve the objectives for which it is introduced. In fact, applications of costing are very wide. All types of activities, manufacturing and non-manufacturing, should consider the use of cost accounting.

4. **It is a failure:** The failure of a costing system in some concerns is quoted as an argument against its introduction in other undertakings. This is a very fallacious argument. If a system does not produce the desired results, it is wrong to jump to the conclusion that the system is at fault. The reasons for its failure should be probed. In order to make the system a success, the utility of the system should be explained and the cooperation of the employees should be sought by convincing them that the system is for the betterment of all.

1.2 Essentials of a Good Cost Accounting System

Q8. Discuss the essential principle of good cost accounting system.

(OR)

Explain the essential principle of good cost accounting system.

Ans : **(July-21, Dec.-18)**

The essential principles of a good system of cost accounting are as follows:

1. **Suitability:** The method of costing adopted, *i.e.,* job or process costing, should be suitable to the industry and serve the objectives of installing the system.

2. **Specially designed system:** A readymade costing system cannot be suitable for every business. The cost accounting system should be tailormade according to the requirements of a business.

3. **Support of executives:** If a costing system is to be successful, it must be fully supported by executives of various departments and everyone should participate in it.

4. **Cost of the system:** The cost of installing and operating the system should be justified by the results produced.

5. **Clearly defined cost centres:** In order to derive maximum benefits from a costing system, well defined cost centres and responsibility centres should be identified within the organisation.

6. **Controllable costs:** Controllable and non-controllable costs of each responsibility centre should be separately shown.

7. **Integration with financial accounts:** There should be cooperation and coordination between cost accounting and financial accounting departments. In order to avoid duplication of accounts, cost and financial accounts may be integrated.

8. **Continuous education:** Well trained and educated staff should be employed to operate the system. In order to educate the costing staff, written manuals and meetings etc. should be arranged on a continuous basis.

9. **Prompt and accurate reports:** The cost accounting department should prepare accurate reports and promptly submit the same to appropriate level of management so that action may be taken without delay.

10. **Avoid unnecessary details:** Resources should not be wasted on collecting and compiling cost data that is not required. Only useful cost information should be compiled and used whenever required.

1.3 Difference between Cost Accounting and Financial Accounting

Q9. Distinguish between cost accounting and financial accounting.

(OR)

Explain the difference between Cost Accounting and Financial Accounting.

(OR)

Discuss the difference between Cost Accounting and Financial Accounting.

Ans : **(July-19, Dec.-19)**

Differences between Cost Accounting and Financial Accounting are explained below:

S.No.	Basis	Financial Accounting	Cost Accounting
1.	**Purpose**	The main purpose of Financial accounting is to prepare Profit and Loss Account and Balance Sheet Tor reporting to owners or shareholders and other outside agencies, i.e., external users.	The main purpose of cost accounting is to provide detailed cost information to management, i.e., internal users.
2.	**Statutory requirements**	These accounts are obligatory to be prepared according to the legal requirements of Companies Act and Income Tax Act.	Maintenance of these accounts is voluntary except in certain industries where it has been made obligatory to keep cost records under the Companies Act.
3.	**Analysis of cost and profit**	Financial accounts reveal the profit or loss of the business as a whole for a particular period. It does not show the figures of cost and profit for individual products, departments and processes.	Cost accounts show the detailed cost and profit data for each product line, department, process, etc.

4.	**Periodicity of reporting**	Financial reports (Profit and Loss Account and Balance Sheet) are prepared periodically, usually on an annual basis.	Cost reporting is a continuous process and may be daily, weekly, monthly, etc.
5.	**Control aspect**	It lays emphasis on the recording of financial transactions and does not attach importance to control aspect.	It provides for a detailed system of controls with the help of certain special techniques like standard costing and budgetary control.
6.	**Historical and pre-determined costs**	It is concerned almost exclusively with historical records. The historical nature of financial accounting can be easily understood in the context of the purposes for which it was designed.	It is concerned not only with historical costs but also with predetermined costs. This is because cost accounting does not end with what has happened in the past. It extends to plans and policies to improve performance in the future.
7.	**Format of presenting information**	Financial accounting has a single uniform format of presenting information, i.e., Profit and Loss Account, Balance Sheet and Cash Flow Statement.	Cost accounting has varied forms of presenting cost information which are tailored to meet the needs of management and thus lacks a uniform format.
8.	**Types of transactions recorded**	Financial accounting records only external transactions like sales, purchases, receipts, etc., with outside parties. It does not record internal transactions.	Cost accounting not only records external transactions but also internal or inter-departmental transactions like issue of materials by store-keeper to production departments.
9.	**Types of statements prepared**	Financial accounting prepares general purpose statements like Profit and Loss Account and Balance Sheet. That is to say that financial accounting must produce information that is used by many classes of people, none of whom have explicitly defined informational needs.	Cost accounting generates special purpose statements and reports like Report on Loss of Materials, Idle Time Report, Variance Report, etc. Cost accounting identifies the user, discusses his problems and needs and provides tailored information.

1.4 COST CONCEPTS

Q10. What are the various cost concepts are used in cost accounting.

Ans :

Meaning

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

Definition

According to Oxford Dictionary, cost means "the price paid for something". However, some of the definitions of cost are given below:

Cost is "the amount of expenditure (actual or notional) incurred or attributable to a given thing".

i) Cost Centre

A cost centre is defined by CIMA of UK as "a location, person, or item of equipment (or group of these) for which costs may be ascertained and used for the purpose of control". Thus, a cost centre refers to a section of the business to which costs can be charged. It may be a location (a department, a sales area), an item of equipment (a machine, a delivery van), a person (a salesman, a machine operator) or a group of these (two automatic machines opereated by one workman). The main purpose of ascertaining the cost of a cost centre is control of cost.

ii) Cost Unit

A cost unit is defined by CIMA as a "unit of product, service or time in relation to which cost may be ascertained or expressed". Cost units are the 'things', that the business is set up to provide of which cost is ascertained.

iii) Profit Centre

Profit centre is that segment of an organisation for which both cost as well as profit are ascertained. The scope of a profit centre is broader than that of a cost centre because in a cost centre only cost is ascertained, whereas in a profit centre both cost as well as revenue are ascertained in monetary terms. The difference between revenue and cost is profit. In the words of Anthony and Welsch, "A profit centre is a responsibility centre in which inputs are measured in terms of expenses and outputs are measured in terms of revenues".

Q11. What are the elements of cost ?

(OR)

Mention the various elements of cost.

Ans : **(Dec.-18)**

It is very important to the management to have knowledged about the cost of a form for analyzing and classified the cost for better control and taking effective management decisions.

Types of Cost Elements

The total cost consists of three important elements which are as follows :

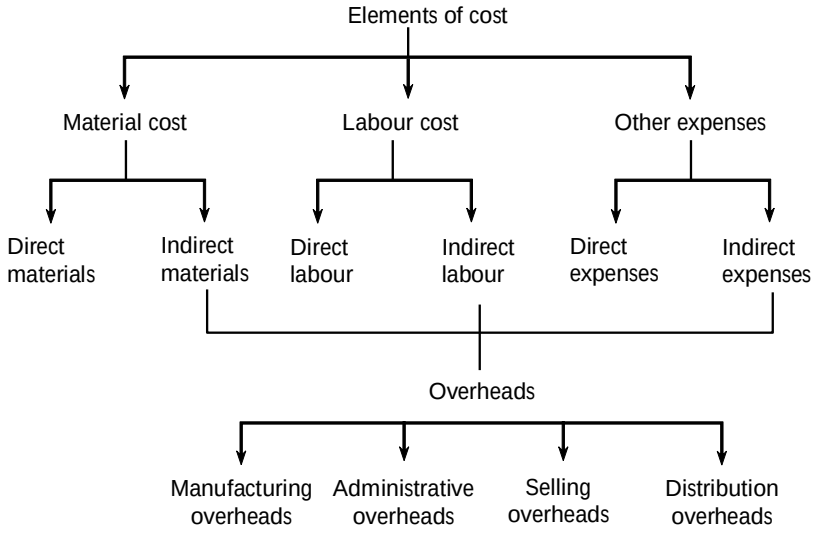


Figure: Elements of Cost

1. Material Cost

It is classified into two types. They are,

(i) Direct material

(ii) Indirect materials.

(i) Direct Materials: The materials that are easily identified, measured, and charged directly to the product are called as direct materials. These materials can directly enter into the process of production of finished products and act as an important part of the finished product.

Example: Wood in tables, leather in shoes, bricks used in building house etc., are the example, of direct materials. Direct material consists of the following components,

(a) Raw materials.

(b) Specially purchased materials for the production of specific products.

(c) Components purchased for production.

Direct materials require strict control and critical assessment for controlling and minimizing the costs.

(ii) Indirect Materials: The materials which cannot be identified and measured directly as direct materials are called as indirect materials. In simple words, the materials which may or may not be a part of finished goods are called as indirect materials.

They require simple control techniques as their value and composition in production is low when compared to direct materials. Though some materials are a part of finished products, they are sometimes not treated as direct materials if they have very negligible part of contribution in finished product. Hence, these materials are treated as indirect materials.

Example: Thread used in a dress etc.

2. Labour Costs

The labour costs are classified into two types. They are,

(i) Direct labour

(ii) Indirect labour.

(i) Direct Labour

The labour who is directly involved in the production process or attributed to a specific job is called as direct labour. The wages that are paid to direct labour are called as direct wages. The direct labour includes the following groups of labour.

(a) The labour involved in the actual production process.

(b) The labour involved in supervision, maintenance, tools setting etc.

(c) Inspectors, analysts etc., are needed for such production process.

The wages/salaries of inspectors and supervisors can be considered as direct labour if their efforts in the production process are measurable.

(ii) Indirect Labour

The labour who is not possible to identify and are not attributed to a particular job or department is called as indirect labour. The salaries/wages that are paid to indirect labour are called as indirect wages.

Example: The trainees from outside agencies who are employed to train the workers in the firm.

3. Other Expenses

The other expenses include the direct and indirect expenses.

(i) Direct Expenses

The expenses that can be easily identified and charged to a specific cost centre or department are called as direct expenses. The expenses (except direct materials and direct labour) which are incurred for a specific purpose are known as direct expenses.

CIMA defined direct expenses "the expenses which are identified with and allocated to cost centre or a department".

Direct expenses can be easily allocated to a product.

Example: Royalty, excise duty, etc.

Direct expenses vary proportionately with the changes in the production volume.

(ii) Indirect Expenses

Indirect expenses are also called as overheads. The costs that cannot be charged directly to a particular cost centre are called as indirect expenses. These expenses also include indirect materials and indirect labour.

The overheads are classified into four types which are as follows,

(a) Manufacturing Overheads : These are the indirect expenses which are incurred in the manufacturing operations of the firm.

Example: Depreciation, insurance etc.

(b) Administration Overheads : The overheads that are incurred while developing a policy, guiding the organization and controlling or managing the firm's activities are called as administrative expenses/overheads.

Example: Office rent, light, heat, wages of accountants, clerks and secretaries, legal and accounting machine services etc.

(c) Selling Overheads : These overheads are the indirect costs that are related with the marketing and selling activities. These overheads include the costs for gaining orders from customers, marketing costs, advertising costs etc.

(d) Distribution Overheads : The expenses which are incurred while distributing the product to the final customers are called as distribution overheads. They include the delivery costs, insurance, rent for warehouse, transportation costs etc.

1.5 COST CLASSIFICATION

Q12. How do you classify cost ? Explain in detail.

Ans :

Classification is the process of grouping costs according to their common characteristics. It is a systematic placement of like items of together according to their common features. There are various ways of classifying costs as given below. Each classification serves a different purpose.

1. Classification into Direct and Indirect Costs

Costs are classified into direct costs and indirect costs on the basis of their identifiability with cost units or jobs or processes or cost centres.

Direct costs : These are those costs which are incurred for and conveniently identified with a particular cost unit, process or department. Cost of raw materials used and wages of machine operator are common examples of indirect costs. To be specific, cost of steel used in manufacturing a machine can be conveniently ascertained. It is, therefore, a direct cost. Similarly, wages paid to a tailor in a readymade garments company for stitching a piece of trouser is a direct cost because it can be easily identified in the cost of a trouser.

Indirect costs: These are general costs and are incurred for the benefit of a number of cost units, processes or departments. These costs cannot be conveniently identified with a particular cost unit or cost centre. Depreciation of machinery, insurance, lighting, power, rent, managerial salaries, materials used in repairs, etc., are common examples of indirect costs. For example, depreciation of machine for stitching a piece of trouser cannot be known and thus it is an indirect cost.

2. Classification into Fixed and Variable Costs

Costs behave differently when level of production rises or falls. Certain costs change in sympathy with production level while other costs remain unchanged. As such on the basis of behaviour or variability, costs are classified into fixed, variable and semi-variable.

(i) Fixed costs: These costs remain constant in 'total' amount over a wide range of activity for a specified period of time; i.e., these do not increase or decrease when the volume of production changes. For example, building rent, managerial salaries remain constant and do not change with change in output level and thus are fixed costs. But fixed cost 'per unit' decreases when volume of production increases and vice versa, fixed cost per unit increases when volume of production decreases.

(ii) Variable costs: These costs tend to vary in direct proportion to the volume of output. In other words, when volume of output increases, total variable cost also increases, and vice versa, when volume of output decreases, total variable cost also decreases. But, the variable cost per unit remains fixed.

Thus, in general, variable costs show the following characteristics :

(a) variability of the total amount in direct proportion to the volume of output;

(b) fixed amount per unit in the face of changing volume;

(c) easy and reasonably accurate allocation and apportionment to departments;

(d) such costs can be controlled by functional managers.

(iii) Semi-variable or semi-fixed costs (Mixed costs). These costs include both a fixed and a variable component; i.e., these are partly fixed and partly variable. A semi-variable cost has often a fixed element below which it will not fall at any level of output. The variable element in semi-variable costs changes either at a constant rate or in lumps.

3. Classification into Product Costs and Period Costs

Product costs are those costs which are necessary for production and which will not be incurred if there is no production. These consist of direct materials, direct labour and some of the factory overheads. Product costs are 'absorbed by' or 'attached to' the units produced. These are called inventoriable costs because these are included in the cost of product as work-in-progress, finished goods or cost of sales.

Period costs are those costs which are not necessary for production and are written off as expenses in the period in which these are incurred. Such costs are incurred for a time period and are charged to Profit and Loss Account of the period. Rent, salary of company executives, travel expenses are examples of period costs.

4. Classification into Controllable and Non-controllable Costs

From the point of view of controllability, costs are classified into controllable costs and non-controllable costs.

Controllable Costs: These are the costs which may be directly regulated at a given level of manage-ment authority. Variable costs are generally controllable by department heads. For example, cost of raw material may be controlled by purchasing in larger quantities.

Non-controllable Costs: These are those costs which cannot be influenced by the action of a specified member of an enterprise. For example, it is very difficult to control costs like factory rent, managerial salaries, etc.

5. Classification into Historical Costs and Pre-determined Costs

On the basis of time of computation, costs are classified into historical costs and pre-determined costs.

Historical costs: These are past costs which are ascertained after these have been incurred. Historical costs are thus nothing but actual costs. These costs are not available until after the completion of the manufacturing operations.

Pre-determined costs: These are future costs which are ascertained in advance of production on the basis of a specification of all the factors affecting cost. These costs are extensively used for the purpose of planning and control.

6. Classification into Normal and Abnormal Costs

Normal cost may be defined as cost which is normally incurred on expected lines at a given level of output. This cost is a part of cost of production. Abnormal cost is that which is not normally incurred at a given level of output. Such cost is over and above the normal cost and is not treated as a part of the cost of production. It is charged to costing Profit and Loss Account.

1.5.1 Methods of Classification

Q13. Explain the various methods of cost.

Ans :

The methods or types of costing refer to the methods employed in the ascertainment of costs. Several methods have been designed to suit the needs of different industries. These methods of costing are as follows :

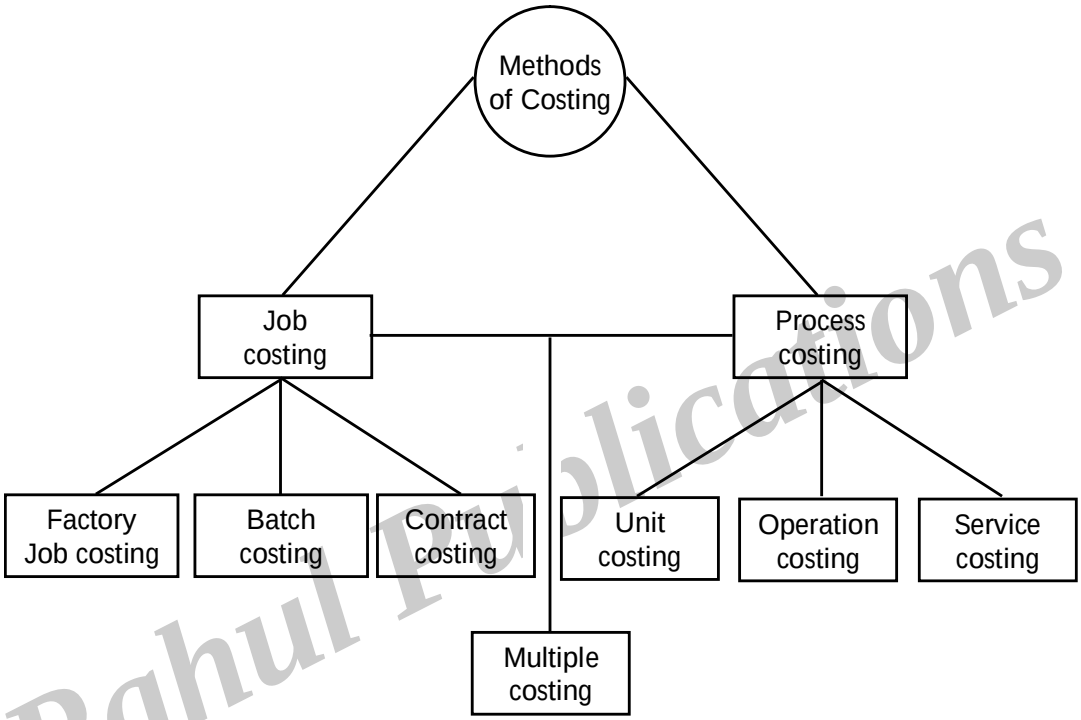


Fig.: Costing Methods

1. **Job order costing:** According to CIMA, UK, this method "applies where work is undertaken to customers' special requirements". *Cost unit in job order costing is a job or work order for which costs are separately collected and accumulated. A job, big or small, comprises a specific quantity of a product to be manufactured as per customer's specifications. The industries where this method is used include printing press, repair shops, interior decorators, painters, etc.

2. **Contract costing or terminal costing:** This is a variation of job costing and, therefore, principles of job costing apply to this method. The difference between job and contract is that job is small and contract is big. It is well said that a contract is a big job and a job is a small contract. The cost unit here is a 'contract' which is of a long duration and may continue over more than one financial year. Contract costing is most suited to construction of buildings, dams, bridges and roads, ship-building, etc.

3. **Batch costing:** Like contract costing, this is also a variation of job costing. In this method, the cost of a batch or group of identical products is ascertained and therefore each batch of products is a cost unit for which costs are ascertained. This method is used in companies engaged in the production of readymade garments, toys, shoes, tyres and tubes, component parts, etc.

4. **Process costing:** As distinct from job costing, this method is used in mass production industries manufacturing standardised products in continuous processes of manufacuring. Costs are accumulated for each process or department. Here raw material has to pass through a number of processes in a particular sequence to completion stage. In order to arrive at the unit cost, the total cost of a process is divided by the number of units produced. The finished product of one process is passed on to the next process as raw material. Textile mills, chemical works, sugar mills, refineries, soap manufacturing, etc., may be cited as examples of industries which employ this method.

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

6. **Single, output or unit costing:** This method of cost ascertainment is used when production is uniform and consists of a single or two or three varieties of the same product. Where the product is produced in different grades, costs are ascertained grade-wise. As the units of output are identical, the cost per unit is found by dividing the total cost by the number of units produced. This method is applied in mines, quarries, brick-kilns, steel production, flour mills, etc.

7. **Operating or service costing:** This method should not be confused with operation costing. Operating costing is used in undertakings which provide services instead of manufacturing products. For example, transport undertakings (road transport, railways, airways, shipping companies), electricity companies, hotels, hospitals, cinema, etc., use this method. The cost units are passenger-kilometre or tonne-kilometre, kilowatts hour, a room per day in a hotel, a seat per show in cinema, etc. This method is a variation of process costing.

8. **Multiple or composite costing:** It is an application of more than one method of cost ascertainment in respect of the same product. This method is used in industries where a number of components are separately manufactured and then assembled into a final product. For example, in a television company, manufacture of different component parts may require different production methods and thus different methods of costing may have to be used. Assembly of these components into final product still requires another method of costing.

Short Question and Answers

1. Define cost accounting.

Ans :

Cost accounting is a formal system of accounting for costs in the books of account by means of which costs of products and services are ascertained and controlled. An authoritative definition of cost accounting has been given by CIMA of UK as follows : "Cost accounting is the process of accounting for costs from the point at which expenditure is incurred or committed to the establishment of its ultimate relationship with cost centres and cost units. In its widest usage, it embraces the preparation of statistical data, the application of cost control methods and ascertainment of profitability of activities carried out or planned".

2. Explain the features of cost accounting.

Ans :

The important features of Cost Accounting are stated below:

(a) It is a process of accounting to determine costs.

(b) It records incomes and expenditures, incurred for manufacturing prowl and rendering services.

(c) It provides statistical data for preparing estimates and submitting quotations.

(d) It is the basis to ascertain and control costs.

3. Cost Ascertainment

Ans :

It deals with the collection and analysis of expenses, the measurement of production of the different products at the different stages of manufacture and the linking up of production with the expenses. In fact, the varying procedures for the collection of expenses give rise to the different systems of costing as Historical or Actual costs, Estimated Costs, Standard Costs etc. Again the varying procedures for the measurement of production have resulted in different methods of costing such as Specific Order Costing, Operation Costing etc.

4. Cost Control

Ans :

Cost Control is the guidance and regulation by executive action of the costs of operating an undertaking. It aims at *guiding* the actual towards the line of targets ; *regulates* the actuals if they deviate or vary from the targets ; this guidance and regulation is done by an *executive* action. The cost can be controlled by standard costing, budgetary control, proper presentation and reporting of cost data and cost audit.

5. Cost Audit

Ans :

Cost Audit is the verification of the correctness of cost accounts and a check on the adherence to the cost accounting plan. Its purpose is not only to ensure that cost accounts and other records are arithmetically correct but also to see that the principles and rules have been applied correctly.

6. Advantages of Cost Accounting.

Ans :

(i) Reveals profitable and unprofitable activities: A system of cost accounting reveals profitable and unprofitable activities. On this information, management may take steps to reduce or eliminate wastages and inefficiencies occurring in any form such as idle time, under-utilisation of plant capacity, spoilage of materials, etc.

(ii) Helps in cost control: Cost accounting helps in controlling costs with special techniques like standard costing and budgetary control.

(iii) Helps in decision making: It supplies suitable cost data and other related information for managerial decision-making, such as

introduction of a new product line, determining export price of products, make or buy, etc.

(iv) Guides in fixing selling prices: Cost is one of the most important factors to be considered while fixing prices. A system of cost accounting guides the management in the fixation of selling prices, particu-larly during depression period when prices may have to be fixed below cost.

(v) Helps in inventory control: Perpetual inventory system, which is an integral part of cost accounting. helps in the preparation of interim profit and loss account. Other inventory control techniques like ABC analysis, level setting, etc., are also used in cost accounting.

7. Explain any two limitations of cost accounting.

Ans :

(i) It is unnecessary: It is argued that maintenance of cost records is not necessary and involves duplication of work. It is based on the premise that a good number of concerns are functioning prosperously without any system of costing. This may be true, but in the present world of competition, to conduct a business with utmost efficiency, the management needs to know detailed cost information for its decision-making. Only a cost accounting system can serve this need of the management and thus help in the more efficient conduct of a business.

(ii) It is expensive: It is pointed out that installation of a costing system is quite expensive which only large concerns can afford. It is also argued that installation of the system will involve additional expendi-ture which will lead to a diminution of profits. In this respect, it may be said that a costing system should be treated as an investment and the benefits derived from the system must exceed the amount spent on it. It should not prove a burden on the finances of the company.

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Ans :

A cost centre is defined by CIMA of UK as "a location, person, or item of equipment (or group of these) for which costs may be ascertained and used for the purpose of control". Thus, a cost centre refers to a section of the business to which costs can be charged. It may be a location (a department, a sales area), an item of equipment (a machine, a delivery van), a person (a salesman, a machine operator) or a group of these (two automatic machines opereated by one workman). The main purpose of ascertaining the cost of a cost centre is control of cost.

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Ans :

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Like contract costing, this is also a variation of job costing. In this method, the cost of a batch or group of identical products is ascertained and therefore each batch of products is a cost unit for which costs are ascertained. This method is used in companies engaged in the production of readymade garments, toys, shoes, tyres and tubes, component parts, etc.

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Ans :

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14. Single, output or unit costing

Ans :

This method of cost ascertainment is used when production is uniform and consists of a single or two or three varieties of the same product. Where the product is produced in different grades, costs are ascertained grade-wise. As the units of output are identical, the cost per unit is found by dividing the total cost by the number of units produced. This method is applied in mines, quarries, brick-kilns, steel production, flour mills, etc.

15. Operating or service costing

Ans :

This method should not be confused with operation costing. Operating costing is used in undertakings which provide services instead of manufacturing products. For example, transport undertakings (road transport, railways, airways, shipping companies), electricity companies, hotels, hospitals, cinema, etc., use this method. The cost units are passenger-kilometre or tonne-kilometre, kilowatts hour, a room per day in a hotel, a seat per show in cinema, etc. This method is a variation of process costing.

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CIMA defined direct expenses “the expenses which are identified with and allocated to cost centre or a department”.

Direct expenses can be easily allocated to a product.

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Direct expenses vary proportionately with the changes in the production volume.

(ii) Indirect Expenses

Indirect expenses are also called as overheads. The costs that cannot be charged directly to a particular cost centre are called as indirect expenses. These expenses also include indirect materials and indirect labour.

Choose the Correct Answer

1. Costing is a technique of [c]
   (a) Inventory control (b) Management control
   (c) Ascertainment of cost (d) Calculation of cost
2. Cost accounting has been developed because of _____ of financial accounting. [a]
   (a) Limitations (b) Expenditure
   (c) Statutory requirements (d) Both (a) and (b)
3. Cost accountancy is the science, art and _____ of cost accountant. [d]
   (a) Profession (b) Management
   (c) Administration (d) Practice
4. Cost accounting is based on _____ figures. [b]
   (a) Approximated (b) Estimated
   (c) Historical (d) Either (a) or (c)
5. _____ costing is used in transport undertaking. [d]
   (a) Operating (b) Standard
   (c) marginal (d) Service
6. Continuous costing is also called [b]
   (a) Operation costing (b) Process costing
   (c) Batch costing (d) Contract costing
7. The main types of costing for ascertaining costs do not include [c]
   (a) Uniform costing (b) Standard costing
   (c) Marginal costing (d) Contract costing
8. Which of the following is variable cost? [b]
   (a) Salaries of higher officers (b) Prime cost
   (c) Insurance cost (e) Repair cost
9. The following is(are) the method(s) to increase profit [d]
   (a) Increase the sales price (b) Increase the market
   (c) Reduce total cost (d) All of the above
10. To control costs it is essential to keep control on [d]
    (a) Prime cost (b) Overheads
    (c) Indirect materials and tools cost (d) All of the above

Fill in the blanks

1. _____ is the process or methodology of accounting for costs.
2. _____ is the act of bringing about a permanent reduction in the elements of cost.
3. _____ is the verification of the correctness of cost accounts.
4. _____ are prepared only at the close of the accounting period.
5. _____ show the profit or loss made during an accounting period and financial position of the business as on a particular date.
6. _____ system normally has higher proportion of direct costs.
7. _____ is a method of costing where production follows a series of sequential processes.
8. _____ refers to ascertainment of costs after they are actually incurred.
9. _____ is a technique that takes into account the total cost of running an enterprise
10. _____ refers to the use of the same costing methods, principles and techniques by several organisations to facilitate common control and comparison of stocks.
11. _____ is anything for which a separate measurement of costs is desired.
12. Direct Expenditure, also known as _____

ANSWERS

1. Cost Accounting
2. Cost Reduction
3. Cost Audit
4. Financial Statements
5. Financial Accounts
6. Contract Costing
7. Process Costing
8. Historical Costing
9. Absorption Costing
10. Uniform Costing
11. A Cost Unit
12. Chargeable Expenses

UNIT II

MATERIAL

Direct and Indirect Material cost – Inventory Control Techniques – Stock Levels – EOQ – ABC Analysis – JIT - VED - FSND - Issue of Materials to Production – Pricing methods: FIFO - LIFO with Base Stock and Simple and Weighted Average methods.

2.1 MATERIAL

2.1.1 Direct and Indirect Material Cost

Q1. What is material ? Briefly explain direct and indirect materials.

Ans :

Meaning

Material is a very important factor of production. It includes physical commodities used to manufacture the final end product. It is the starting point from which the first operations start. It is inventoriable and does not get waste and exhaust (unless it is deteriorated) with the passage of time as labour is wasted with the passage of time whether in use or not.

Another feature of material is that it can be purchased in varying quantities according to the requirements of the firm whereas other elements of cost like labour and other services cannot be easily varied once they are established.

i) Direct Material

Materials which form part of a finished product are known as direct materials. In other words, direct materials can be conveniently and accurately allocated to a particular unit of cost. For example, leather used in the making of a pair of shoes and yarn required for a meter of cloth, are direct materials.

ii) Indirect Materials

Indirect materials, on the other hand, cannot be treated as part of the finished product because it cannot be conveniently and accurately allocated to a particular unit of product.

Examples of such materials can be nails used in the making of shoes, cotton waste and lubricating oil required for the maintenance of machines, buttons and threads used in a suit etc.

Q2. Explain the features of materials ?

Ans :

1. **Availability of materials:** There should be a continuous availability of all types of materials in the factory so that the production may not be held up for want of any material. Minimum quantity of each material is fixed to permit production to move on schedule.
2. **No excessive investment in materials:** There should be no excessive investment in stocks. Investment in materials must not tie up funds that could be better used in other activities. Overstocking should be avoided keeping in view the disadvantages it carries. For this purpose, a maximum quantity is assigned to each item of material above which stock should not be exceeded.
3. **Reasonable price:** While purchasing materials, it is seen that it is purchased at a reasonably low price. Quality is not to be sacrificed at the cost of the lower price. The material purchased should be of that quality alone which is needed.
4. **Minimum wastage:** There should be minimum possible wastage of materials while these are being stored in the godowns by storekeeper or used in the factory by the workers. Wastage should be allowed upto a certain level known as normal level of wastage and it should not exceed that level. Leakage or theft of materials must be avoided to keep the cost of production under control.

Storekeeper and workers should be trained to handle the materials in a scientific way to avoid the wastage. The storekeeper is to keep the stores neat and tidy to avoid the wastage due to rust, dust or dirt.

5. **Risks of spoilage and obsolescence of the materials must be avoided:** For this purpose, a maximum quantity of each material is determined and a proper method of issue of materials is followed. The materials received earlier should be issued earlier.

6. **Information about availability of materials** should be made continuously available to the management so that planning of production may be done. The storekeeper can supply this information because he keeps an up-to-date record of every item of stocks under a proper system of material control.

7. **Material can be easily misappropriated** by employees because generally misappropriation of cash is considered to be more serious than misappropriation in kind. Therefore, this requires an internal check on materials which is a part of material control.

2.2 INVENTORY CONTROL TECHNIQUES

Q3. Define Inventory Control. Explain the objectives of Inventory Control.

(OR)

Discuss the various types of inventory techniques.

Ans : **(Dec. - 19)**

Inventory or material control is defined as "safeguarding of company's property in the form of material by a proper system of recording and also to maintain them at the optimum level considering operating requirements and financial resources of the business." This wide definition embraces control over purchases, storage and consumption of materials and determining the optimum level for each item of inventory. The system of control should be comprehensive enough to cover the flow of materials starting from the point when someone makes a request for the purchase up to the stage when materials are consumed and their costs compiled and assembled in cost sheets.

Objectives

The main objectives of inventory control are listed below :

1. **No understocking:** Understocking leads to materials running out of stock at some time or the other. Shortages of materials may arise at the time when they are urgently needed and production then be delayed. Delay or stoppage in production due to non-availability of materials is very costly as it may result in loss of profits. Material control system ensures that there is no shortage of materials.

2. **No overstocking:** Investment in materials must be kept as low as possible, considering the production requirements and the financial resources of the business. Overstocking of materials unnecessarily locks up capital and causes high storage costs, thus, adversely affecting the profits.

3. **Minimum wastage:** Proper storage conditions must be provided to different types of materials. Losses of materials may occur due to deterioration, obsolescence, theft, evaporation, etc. All efforts should be made to keep these losses at the minimum.

4. **Economy in purchasing:** The purchasing of material is a highly specialized function. By purchasing materials at the most favourable prices, the efficient purchaser is able to make a valuable contribution to the success of a business.

5. **Proper quality of materials:** While purchasing materials, due consideration should also be given to the quality. It is no use purchasing materials of inferior quality or of very superior quality. For each type of product there is a particular quality of materials which is needed and that quality alone should be purchased.

6. **Information about materials:** Not only that materials should be available as and when required, but also there should be a system to give complete and up-to-date accounting information about the stock of materials.

Sometimes inadequate information about the availability of materials may cause new purchases be made of materials already in stock.

7. **Material reports to management:** The material control system should be so designed so as to serve the purpose of accurate and up-to-date reports to management about purchase, consumption and stocks of materials.

2.2.1 Stock Levels – EOQ – ABC Analysis – JIT - VED - FSND

Q4. Explain the techniques of inventory control.

Ans :

1. Level Setting

In order to have proper control on materials, the following levels are set :

(a) Re-order Level
(b) Minimum Level
(c) Maximum Level
(d) Danger Level
(e) Average Stock Level

(a) Re-order Level: It is the point at which if stock of a particular material in store approaches, the storekeeper should initiate the purchase requisition for fresh supplies of that materia.

Re-ordering level can be calculated by applying the following formula.

Ordering Level = Minimum Level + Consumption during the time required to get the fresh delivery.

(b) Minimum (or Safety Stock) Level: This represents the minimum quantity of the material which must be main-tained in hand at all times. The quantity is fixed so that production may not be held up due to shortage of the material.

Minimum Stock Level = Re-ordering level – (Normal Consumption × Normal Re-order Period.

(c) Maximum Level: It represents the maximum quantity of an item of material which car be neld in stock at any time. Stock should not exceed this quantity. The quantity is fixed so that there may be no overstocking.

Maximum Stock Level = Reordering Level + Re-ordering Quantity – (Minimum Consumption × Minimum Re-ordering Period).

(d) Danger Level: This means a level at which normal issues of the material are stopped and issues are made only under specific instructions. The purchase officer will make special arrangements to get the materials which reach at their danger levels so that the production may not stop due to shortage of materials.

Danger Level = Average consumption × Max. re-order period for emergency purchases.

(e) Average Stock Level: This level is calculated by the following formula :

Average Stock Level = Minimum Stock Level + $\frac{1}{2}$ of Re-order Quantity

OR

$\frac{1}{2}$ (Minimum Stock Level + Maximum Stock Level)

2. EOQ

EOQ stands for economic order quantity it also known as optimal quantity.

Economic order quantity is the size of the order which gives maximum economy in purchasing any material and ultimately contributes towards maintaining the material at the optimum level and at the minimum cost. It equates the cost of ordering with the cost of storage of materials.

Ordering cost

It mainly includes cost of stationery, salaries of those engaged in receiving and inspecting, salaries of those engaged in preparing the purchase orders, etc.

$$EOQ = \sqrt{\frac{2AO}{C}}$$

where

EOQ = Quantity to be ordered

A = Annual consumption of the material in units

O = Cost of placing one order including the cost of receiving the goods

C = Interest payments including cost of storage per unit per year.

3. ABC Analysis

ABC technique is a value-based system of material control. In this technique of selective control, materials are analysed according to their value so that costly and more valuable materials are given greater attention and care. All items of materials are classified according to their value, i.e., high, medium and low values, which are known as A, B and C items respectively. ABC technique is sometimes called Always Better Control method.

'A' Items: These are high value items which may consist of only a small percentage of the total items handled. On account of their high cost, these materials should be under the tightest control and the responsibility of the most experienced personnel.

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

'C' Iems: These are low value materials which may represent a very large number of items. These materials should be under the simple and economic methods of control.

Advantages

The advantages of ABC technique are as follows:

1. Closer and stricter control can be exercised on those items which represent large amounts of capital invested.
2. Investment in inventory is regulated and funds can be utilized in the best possible way.
3. Economy in stock carrying costs is achieved.
4. It helps in maintaining enough safety stock for *V* category items.
5. Selective control helps in maintaining high stock turnover rate.

4. JIT (Just-in-Time)

Just-in-time (JIT) System was first developed in the Toyota Motor Company in Japan. It is sometimes called as Zero Inventory System. It is a system under which materials are not purchased and kept in stock for future use but are purchased just in time i.e., immediately before these are required for use in production. According to CIMA London, JIT purchasing is 'matching receipt of materials closely with usage so that raw material inventory is reduced to near zero level'. This means in JIT approach a firm should maintain minimum level of inventory and rely on suppliers for parts and components 'just-in-time' to meet assembly / production requirements.

5. VED

In addition to the conventional ABC analysis, VED analysis also plays an important role in material management. In VED analysis, materials are classified into three broad categories, namely V materials, 'E' materials, and 'D' materials. The classification of material items is on the basis of their criticality for the industry or company.

'V' stands for Vital material items in the sense that when these are out of stock or when not readily available, the production activity comes to a complete halt or is drastically affected.

'E' is for Essential items without which temporary losses of production or dislocation of production work occurs. Their stock-out cost is very high.

'D' denotes Desirable items i.e. all other items of materials which are necessary but do not cause any immediate effect on production.

6. FSND

In FNSD analysis, materials are classified according to their rate of consumption. This helps in controlling obsolescence of various material items. The classification is broadly into four groups as under:

F - are Fast moving materials which are consumed in a short span of time,

N - are Normal moving materials which are exhausted over a period of a year or so

S - are Slow moving materials, stock of which would last for more than one year, and

D - are Dead stock or non-moving materials. No further demand of such materials is foreseen.

According to FNSD technique, fast moving and normal movingitems of materials should be constantly monitored and timely replenishment orders need to be placed to avoid out of stock situations.

PROBLEMS ON INVENTORY

1. Two components A and B are used as follows,

Normal usage 300 units per week each

Maximum usage 450 units per week each

Minimum usage 150 units per week each

Re-order Quantity A – 2400 units B - 3,600 units

Re-order period A – 4 to 6 weeks B – 2 to 4 weeks

Calculate for each component

(a) Re-order level

(b) Minimum level

(c) Maximum level

(d) Average stock level

Sol :

(a) Reorder level = Maximum usage × Maximum Reorder period.

Re-order level of material A = 450 × 6 $\Rightarrow$ 2700 units

Re-order level of material B = 450 × 4 $\Rightarrow$ 1800 units

(b) Minimum level = Re-order level - [Normal consumption × Normal re-order period]

= Normal re-order period

$$= \frac{\text{Max.period} \times \text{Min period}}{2}$$

$$A = \frac{6+4}{2} = 5 \text{ weeks}$$

$$B = \frac{2+4}{2} = 3 \text{ weeks}$$

A = 2700 – [300 × 5] $\Rightarrow$ 2700 – 1500 $\Rightarrow$ 1200 units

B = 1800 – [300 × 3] $\Rightarrow$ 1800 – 900 $\Rightarrow$ 900 units

(c) Maximum stock level = Re-ordering level + Reordering quantity – [Minimum consumption × Minimum Re-order period]

A $\Rightarrow$ 2700 + 2400 – [150 × 4] = 5100 – 600 $\Rightarrow$ 4,500 units

B $\Rightarrow$ 1800 + 3600 – [150 × 2] = 5400 – 300 $\Rightarrow$ 5100 units

(d) Average stock level = Minimum level + Half of Re-order Quantity

A = 1200 + 1/2 [2,400] = 1,200 + 1,200 $\Rightarrow$ 2400 units

B = 900 + 1/2 [3600]

= 900 + 1800 = 2,700 units

---

2. Following information is available in respect of component D-20 :

Maximum stock level : 8,400 units

Budgeted consumption per month :

Maximum 1500 units

Minimum 800 units.

Estimated delivery period :

Maximum 4 moths, minimum 2 months

Calculate :

i) Re-order Level, and

ii) Re-order Quantity

Sol :

Reorder Level = Maximum usage × Max Reorder period

= 1500 × 4 = 6000 units

Max stock level = Reorder Level + Reorder Quantity – [Min usage × Min Reorder period]

8400 = 6000 + ROQ – [800 × 2]

8400 = 6000 + ROQ – 1600

8400 = 4400 + ROQ

Reorder Quantity = 8400 – 4400 = 4000 units

---

3. Two components A and B are used as follows:

Normal Usage	**50 units per week**
Minimum Usage	**25 units per week**
Maximum Usage	**75 units per week**
Re-order Quantity	**A - 300 units, B - 500 units**
Re-order Period	**A - 4 to 6 weeks B - 2 to 4 weeks**

Calculate Stock Levels for each Component.

Sol : **(July-19)**

(A) Reorder Level : Maximum usage × Maximum Reorder period

A = 75 units × 6 weeks = 450 units

B = 75 units × 4 weeks = 300 units

(B) Minimum Level : Reorder level – (Normal usage × Normal Reorder period)

A = 450 units – (50 units × 5 weeks)

450 units – 250 units = 200 units

B = 300 units – (50 units × 3 weeks)

300 units – 150 units = 150 units

(C) Maximum Level : Reorder level + Reorder quantity – (Minimum usage × Minimum Reorder period)

A = 450 units + 300 units – (25 units × 4 weeks)

750 units – 100 units = 650 units

B = 300 units + 500 units – (25 units × 2 weeks)

800 units – 50 units = 750 units

(D) Average Stock Level : Minimum level + $\frac{1}{2}$ (Reorder Quantity)

A = 200 units + $\frac{1}{2}$ (300 units)

200 units + 150 units = 350 units

B = 150 units + $\frac{1}{2}$ (500 units)

150 units + 250 units = 400 units

Working Notes

Calculation of Normal Reorder Period

$$\frac{\text{Minimum Reorder Period + Maximum Reorder Period}}{2}$$

$$A = \frac{4 \text{ weeks} + 6 \text{ weeks}}{2} = 5 \text{ weeks}$$

$$B = \frac{2 \text{ weeks} + 4 \text{ weeks}}{2} = 3 \text{ weeks}$$

ROQ = Reorder Quantity

4. What do you understand by Re-order level? Calculate the Maximum, Minimum and Re-order level from the given data :

Re-Ordering Quantity	**1500 units**
Re-Ordering Period	**4 to 6 weeks**
Maximum Consumption	**400 units per week**
Minimum Consumption	**250 units per week**
Normal Consumption	**300 Units per week**

Sol : **(Dec.-18)**

It is the point at which if stock of a particular material in store approaches, the storekeeper should initiate the purchase requisition for fresh supplies of that materia.

Re-ordering level can be calculated by applying the following formula.

Ordering Level = Minimum Level + Consumption during the time required to get the fresh delivery.

Reorder Level

Maximum consumption × Maximum Reorder period

400 units × 6 weeks = 2,400 Units

Minimum Stock Level

Reorder level – (Normal consumption × Normal reorder period

2,400 Units – (325 units × 5 weeks)

2,400 units – 1, 625 units = 775 units.

Maximum Stock Level

Reorder level + Reorder quantity – (Minimum Consumption × Minimum Reorder period)

2,400 units + 1,500 units – (250 units × 4 weeks)

3,900 units – 1,000 units = 2,900 units

Working Notes

(a) Calculation of Normal Consumption

$$\frac{\text{Minimum consumption + maximum consumption}}{2}$$

$$\frac{250\text{units} + 400\text{units}}{2} = \frac{650\text{units}}{2} = 325 \text{ units.}$$

(b) Calculation of Normal Reorder Period

$$\frac{\text{Minimum Reorder Period + Maximum Reorder Period}}{2}$$

$$\frac{4\text{weeks} + 6\text{weeks}}{2} = 5 \text{ weeks}$$

5. The annual demand for an electronic item is approximately 9125 items. Every time an order is placed a fixed cost of Rs. 25 is incurred. The holding cost per item of inventory is Rs. 146. Calculate Economic Order Quantity.

Sol :

Economic order quantity = $\sqrt{\frac{2AO}{C}}$

A = Annual Consumption = 9125

O = Order cost = 25

C = Carrying cost = 146

EOQ = $\sqrt{\frac{2 \times 9125 \times 25}{146}} = \sqrt{3125}$

EOQ = 55.9 or 56

---

6. From the following information, find out:

How much should be ordered each time ; and

Annual consumption = 12,000 units (360 days)

Cost per unit = Rs. 10

Ordering cost = Rs. 120 per order

Inventory carrying cost = 24%

Normal lead time = 15 days

Safety stock = 30 days consumption

Sol :

Given,

A = Annual consumption = 12,000 units.

O = Ordering cost = Rs. 120

Cost per unit = Rs. 10

C = Inventory carrying cost

= Rs. 10 × 24% = Rs. 2.4

$\therefore$ EOQ = $\sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 12000 \times 120}{2.4}} = \sqrt{\frac{28,80,000}{2.4}}$

$\therefore$ EOQ = 1095 units.

No. of orders to be placed in a year

$= \frac{C}{EOQ} = \frac{12000}{1095} = 11$ orders.

Safety stock = Average usage × Period of which safety stock's kept

$= \frac{12000}{360} \times 30 = 1000$ units

Orders to placed = $\frac{360}{11} = 33$ days.

7. Calculate EOQ from the following :

Annual consumption 600 units : Ordering Cost ` 12 per order. Carrying cost 20%; Price per unit ` 20.

Sol :

Given

A = Annual Consumption
= 600 units,

O = Ordering Cost per order
= ` 12

C = Carrying cost per unit
= 20% × ` 20 = Rs. 4

$$EOQ = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 600 \times 12}{4}}$$

= 60 units.

8. Annual Consumption 1200 Units, Ordering Cost of Rs.24 per order, Price per Unit Rs.20 and Carrying Cost 20%. Calculate E.O.Q.

Sol : **(July-21)**

$$EOQ = \sqrt{\frac{2AO}{C}}$$

$$= \sqrt{\frac{2 \times 1200 \times 24}{20\% \text{ of } ` 20}}$$

$$= \sqrt{\frac{2 \times 1200 \times 24}{4}} = \sqrt{14,400}$$

= 120

9. From the information given below calculate EOQ

Annual usage 8000 units

Purchase Price per unit ` 10

Ordering Cost per Order ` 80

Carrying Cost 20% p.a. per Unit Cost.

Sol :

$$EOQ = \sqrt{\frac{2AO}{C}}$$

Annual cost = 8,000 units

Ordering cost = 80 ` per order

$$\text{Carrying cost} = 10 \times \frac{20}{100} = 2 \text{ `}$$

$$= \sqrt{\frac{2 \times 8000 \times 80}{2}}$$

$$= \sqrt{\frac{12,80,000}{2}}$$

$$= \sqrt{6,40,000}$$

= 800 units

10. Calculate EOQ from the following Annual Consumption = 3,600 units, Ordering Cost `144 per order, Carrying Cost 20%, Price per unit ` 400.

Sol : **(Dec.-18, (KU))**

$$EOQ = \sqrt{\frac{2AO}{C}}$$

A = 3600 units

O = 144 per order

$$C = 400 \times \frac{20}{100} = 80$$

$$EOQ = \sqrt{\frac{2 \times 3600 \times 144}{80}}$$

$$= \sqrt{\frac{10,36,800}{80}} = \sqrt{12,960}$$

= 113.84 Units

2.3 Issue of Materials to Production

Q5. Discuss in detail about the issue of materials to production.

Ans :

The materials are usually received by the storekeeper and he keeps it cautiously and then these materials are being issued to different departments of an organization. It is the responsibility of the storekeeper to receive and store the items. The different forms which are used for material issues are explained as follows,

1. Material Requisition

Material requisition is a document which is used for authorizing and recording the issue of material. It must be issued by the storekeeper only when material requisition note is given. The specimen of material requisition is given as follows,

XYZ Co. Ltd.
Material Requisition Note

MR No. **L.F**

Job No. **Date**

Please Issue the Materials Given Below

Item No.	Material	Code No.	Quantity		Value		Comment
			Required	Issued	Rate	Total	

Requisitioned by:

Authorised by: ..... Bill No. Priced by :

Bin Card No. Issued by :

Received by :

2. Bills of Materials

All the materials which are needed for a particular job or performance of work order are called as "Bill of materials". The production planning department prepares the bill of material and then sends it to the storekeeper instead of one or two material requisitions.

The specimen of bill of material is as follows,

Bill of Materials

Department authorised : **Date :**

Job No.: **No. :**

Item No.	Name	Code No.	Description	Quantity	Rate	(`)	Comment

Prepared by : **Priced by :**

Checked by : **Storekeeper :**

Received by :

3. Materials Returned or Return of Materials

Extra material is returned to the store along with a note called as "Materials Returned Note". This happens usually when the material is in extra quantity, and it is returned to the store.

The specimen of materials returned note is as follows,

Materials Returned Note

Department: **Date:**

Job No.: **No.:**

Quantity	Description	Code No.	Rate	Price

Material received by : **Entered on Storecard :**

Date : **Returner's Signature :**

4. Materials Transferred or Transfer of Materials

Usually the materials are transferred from one department to another as and when the need arises. This is usually done in special cases. A strict method is being followed for transfer of materials.

The specimen for materials transfer note is as follows,

Materials Transfer Note

No: **Date :**

From : **To :**

Job No. : **Job No. :**

Order No. :

For Cost Office Use

Item No.	Description	Quantity	Code	Rate	(`)	Comment

Authorised by : **Priced by :**

Transfer : **Receiver :**

Debited job No. :

5. Loss of Material or Material Losses

During the process of handling, storing and using, few materials can be damaged, get defective, wasted or go scrap. Thus, every organisation faces the issues of wastage, scrap, spoilage and defective material.

(i) Normal Wastage

Normal wastage cannot be avoided as it is natural and incidental in nature. This type of wastage cannot be ascertained before hand. Thus, it is unavoidable.

(ii) Abnormal Wastage

When loss of material is more than normal loss, then it is called as abnormal wastage. This type of loss can take place due to many reasons like defective, improper handling, theft, natural disasters and so on.

(iii) Spoilage

Spoilage takes place when the goods are damaged to such an extent that even additional cost cannot correct them. It is usually the difference between the actual cost upto the rejection point minus the salvage value or cost of material used.

Spoilage = Actual cost - Salvage value

(iv) Defectives

Defectives are the part of a product which during the method of manufacturing results in few product imperfection. Defectives can be corrected with the help of an additional cost.

(v) Scrap

Scrap is remaining part of few types of manufacturing of less quantity and value which are recoverable without, additional processing. Scrap takes place due to turnings, borings, trimmings and so on.

Q6. What is centralized buying? Write its advantages and disadvantages.

Ans : **(Dec.-18)**

Meaning

In simple words, centralized procurement is a purchase of all required goods and services by a single department for all the branches of the entire company. Generally, a purchasing manager heads the department.

Centralized procurement is beneficial in finding the best deals with local vendors for the corresponding location of the company department. It not only aids in avoiding duplicity of orders, but also promotes advantages arising from the high volume bulk discounts, lower transportation and inventory management costs. Centralized purchasing is an indispensable solution for those who feel difficulties in managing long-running transitions and mending fences.

Advantages

1. As the duplication of efforts in buying function is eliminated, its cost will be relatively less and it will be managed efficiently
2. The Manager of manufacturing departments, departmental heads and office managers are relieved from the responsibility of purchasing their own requirements. They can concentrate in their assigned areas of activities in a better way.
3. It is possible to tap the advantage of the specialized skill of the buying staff.
4. Bulk buying strengthens the bargaining position of the buyer. Moreover, the advantage of the quantity discount can be tapped. Direct contact with the suppliers will be possible which will eliminate the link of the intermediaries
5. It enables to develop and maintain good relations with the suppliers. Moreover, it facilitates the supplier to maintain relations with few buyers and thus it enables him to pass over some benefits on buyers.
6. It will enable the purchase of standardized items through standardized procedure.
7. It will reduce the inventory carrying costs. The minimum level of inventory are not maintained at different centers but at centralized center which reduce investments in inventories along with the other incidental storing costs. The central buying staff manages the stock levels, recording material usage, lead time and prices effectively.
8. The receiving of large supply through consolidated orders reduces the transport cost per unit.
9. The cost of order processing such as order placing, receiving, inspection, accounts etc are reduced substantially due to few orders of large quantities
10. As the responsibility center is fixed on one departmental head, the shifting of responsibility for wrong decisions is eliminated.
11. The inter-section requirements of the materials can be easily adjusted. Scarce materials can be allocated according to the economical advantage.

Disadvantages

The centralized purchasing suffers from the following limitations:

1. The specific requirements of the individual items may not be attended successfully. At times, it may result in absence of matching of mind between the needy section and the buying section resulting in wrong buying.
2. The centralized standard procedure may result in delays in receiving the materials.
3. It is likely that the centralized buying staff may not be expert in buying varied types of items.
4. In case of multi-plant units located at distant places and receiving their requirements from centralized storing, it may not be possible to tap the local resources. However, this situation can be handled effectively authorizing the regional purchase agent to make local purchases if they involve cost advantage.
5. It adversely affects the employee morale. It can be concluded that the company should centralize all policy matters, the purchase of major raw materials and capital equipment should be made by the head office, while the individual divisions should be allowed to make their own purchases in accordance with the policies established by central office. If the company adopts the "profit center decentra-lized" set up the decentralized should be made accordingly.

2.4 PRICING METHODS

2.4.1 FIFO - LIFO with Base Stock and Simple and Weighted Average methods

Q7. Explain various pricing methods ?

Ans :

Materials are issued to different jobs or work orders from the stores. These jobs or work orders are charged with the value of material consignments received at different dates and prices. It becomes necessary to decide about the price that is to be charged to a particular job when materials are issued to it. Following are the important methods of pricing of materials.

1. First in First Out (FIFO) Method

Under this method, materials are charged to the various jobs, orders etc. at actual cost, on the assumption that various lots are used in the same order in which they are received into stock. In other words, the issues are priced in the order of purchases. Material received first is issued first. Suppose, on 8th January, 300 units are purchased @ ` 2.00 per unit and on 12th January 200 units are purchased @ ` 2.20 per unit. On 15th January 400 units are issued. Then the issues will be priced as follows: 300 units @ ` 2.00 per unit = ` 600 100 units @ ` 2.20 = ` 220 Total Issue value will be ` 820.

Advantages

i) It is simple to understand and easy to implement.

ii) Materials are issued at the purchase price. Hence, the cost of jobs or work orders is correctly ascertained.

iii) Materials are charged at actual cost to job, work orders, processes etc., hence balancing of stores ledger becomes easy. No adjustment for profit or loss is necessary because of arbitrary valuation of material issues.

iv) It is a realistic method in as much as the material issues are made in the same order in which materials are received in the store.

v) It tends to keep the value of inventory nearer to the current market price as well as at cost.

vi) It is useful where transactions are not too many and price of materials is fairly steady.

Disadvantages

i) Calculations become complicated and cumbersome, if materials are received frequently at fluctuating prices.

ii) It is possible that the cost of two similar jobs under taken on the same day may differ simply because materials have been taken from different lots even though materials used are of the same nature.

iii) More than one price may have to be adopted for pricing one requisition.

iv) The effect of current market price is not revealed in the cost of issues when the price is fluctuating.

2. Last In First Out (LIFO) Method

This method assumes that materials purchased are issued in the reverse order i.e. the last receipt is the first issue. The cost of materials last received is used in pricing the materials first issued.

Advantages

i) It is simple to understand and easy to operate.

ii) The issues will be priced at market rate and the cost thus ascertained will enable the price to be fixed on competitive basis.

iii) The Principle of issuing the materials at cost is retained.

iv) Material accounting is not difficult. There is no need for accounting for any profit or loss in materials account.

v) In times of rising prices, this method is suitable because material is issued at market price, which is high.

Disadvantages

i) As in case of FIFO method, calculation becomes complicated and cumbersome when rates of the materials purchased are highly fluctuating.

ii) Sometimes, more than one price must be adopted for pricing a single requisition. Costs of two similar jobs may differ because materials issued are charged at different rates.

iii) It is not logical, as it is not according to physical flow of materials from the stores.

iv) Materials are charged at the latest purchase price whereas issue of material generally takes place in order in which they are purchased.

3. Average Cost Method

The principal underlying the average cost method is that identity of different lots of materials is lost when they are received in stores and therefore it is proper if the materials are issued at the average cost of materials in store. Average may be of two types, namely, simple and weighted. Under simple average price method, price paid for different lots of materials are added and the total is divided by the number of prices. Weighted average price is arrived at by dividing the total cost of materials purchased by total quantity purchased.

(a) Simple Average Method is very easy to operate. It gives satisfactory results in case prices of purchases do not show marked fluctuations. This method suffers from several drawbacks. It does not charge actual cost of materials to production and therefore a profit or loss may arise merely on account of using this method. It does not take into consideration the quantity of materials purchased at different prices. Clerical work is also considerably increased at the time of every issue of material.

(b) Weighted Average Price method is more scientific than the simple average price method as it takes both price and quantity into consideration. The average does not change with every issue of materials. It changes only when a fresh purchase is made. This method is frequently used and under normal circumstances gives the best results. However, the value of closing stock does not represent either the actual cost or current market price.

4. Base Stock Method

This method assumes that every concern will maintain minimum quantity of stock. This quantity is termed as base-stock. This base stock or minimum stock is always kept in store and is not used unless an emergency arises. This method is generally used with FIFO or LIFO method.

5. Specific Price Method

Under this method, materials are issued at the price at which they were originally purchased. This method is used when materials have been purchased for a specific job. Such materials, when they are received, are earmarked for the job against which they are purchased and are issued only against the job when demanded by it.

6. Market Price or Replacement Price Method

Under this method, issues are priced at the market rate prevailing on the date of issue. The following advantages are claimed, (i) It will disclose efficiency or inefficiency in buying the materials. The stores account will show a profit in case of efficient buying and loss in case of inefficient buying (ii) The method is most suitable when quotations or tenders have to be made because they are to be quoted at competitive prices.

The method suffers from the following drawbacks. It makes the stores records unnecessarily complicated by taking into account the profit or loss factor. Cost ascertainment and cost estimation are two different things. The main purpose of cost accounts is to find out the cost and this cannot be achieved by giving up the cost basis. Sometimes, it may not be possible to ascertain the market price in which case the pricing of materials will pose considerable difficulty.

7. Standard Price Method

Under this method, all receipts of materials are recorded at the actual price paid, but all issues are priced at a pre-determined rate that is termed as standard price. The standard price is fixed for each material after taking into account factors such as quantity of materials to be purchased, market conditions etc. The chief advantages of this method are as follows:

It is relatively easy to operate because all issues of materials are priced at the same price. A lot of clerical labour is saved. The efficiency of the buying department can be judged. The stores account shows profit or loss on issue because standard price may be higher or lower than the actual price paid. If the standard price is higher than the actual price, the variance is termed as favourable and buying is regarded as efficient and vice-versa. The system is used mostly in industries that maintain their cost accounts on standard costing system.

PROBLEMS ON PRICING METHODS

11. From the following particulars, prepare stores Ledger by using FIFO method.

Jan 1 Opening Balance 500 units @ 4 Rs. per unit

Jan 5 Received from Vendor 200 units @ 4.25 Rs. per unit

Jan 12 Received from Vendor 150 units @ 4.10 Rs. per unit

Jan 20 Received from Vendor 300 units @ 4.50 Rs. per unit

Jan 25 Received from Vendor 400 units @ 4.00 Rs. per unit

Issue of Materials

Jan. 4 – 200 units, Jan. 10th – 400 units

Jan. 15 – 100 units, Jan. 19th – 100 units

Jan. 26 – 200 units, Jan. 30th – 250 units

Sol : **(Dec.-18)**

Stores Ledger - FIFO Method

Date	Receipts			Issues			Balance			Remarks
	Qty (units)	Rate	Amount	Qty (units)	Rate	Amount	Qty (units)	Rate	Amount	
Jan,1							500	4	2,000	Opening Balance
Jan, 4				200	4	800	300	4	1,200	
							300	4	1,200	
Jan, 5	200	4.25	850				200	4.25	850	
				300	4	1,200				
Jan,10				100	4.25	425	100	4.25	425	
							100	4.25	425	
Jan, 12	150	4.10	615				150	4.10	615	
Jan, 15				100	4.25	425	150	4.10	615	
Jan, 19				100	4.10	410	50	4.10	205	
							50	4.10	205	
Jan, 20	300	4.50	1,350				300	4.50	1,350	
							50	4.10	205	
Jan, 25	400	4	1,600				300	4.50	1,350	
							400	4	1,600	
				50	4.10	205	150	4.50	675	
Jan, 26				150	4.50	675	400	4	1,600	
				150	4.50	675				
Jan, 30				100	4	400	300	4	1,200	Closing Balance

12. From the following information, prepare Stores Ledger Account showing the issue of material on FIFO Method and give the value of stock at the end of the period.

1s' October 2017	**Balance 500 units at ` 5 per unit**
10th October 2017	**Purchased 350 units at ` 5 per unit**
18th October 2017	**Issued 550 units to Department X**
21st October 2017	**Purchased 180 units at ` 5-50 p per unit**
25th October 2017	**Purchased 350 units at ` 6 per unit**
1st November 2017	**Issued 375 units' to Department Y**
10th November 2017	**Purchased 200 units at ` 6-50 per unit**
20lh November 2017	**Issued 250 units to Department Z**

Sol : **(Dec.-18, KU)**

Stores Ledger (FIFO Method)

Date	Particulars	Receipts			Issues			Balance		
		Qty.	Rate	Amount	Qty.	Rate	Amount	Qty.	Rate	Amount
1/10	To Opening balance	-	-	-	-	-	-	500	5	2500
10/10	To Purchases	350	5	1750	-	-	-	500	5	2500
								350	5	1750
18/10	To Issue	-	-	-	500	5	2500	-	-	-
					50	5	25	300	5	1500
21/10	To Purchases	180	5.50	990	-	-	-	300	5	1500
								180	5.50	990
25/10	To Purchases	350	6	2100	-	-	-	300	5	1500
								180	5.50	900
								350	6	2100
1/11	To Issue	-	-	-	300	5	1500	105	5.50	577.5
					75	5.50	412.50	350	6	2100
10/11	To Purchases	200	6.50	1300	-	-	-	105	5.50	577.50
								350	6	2100
								200	6.50	1300
20/11	To Issue	-	-	-	105	5.50	577.50	-	-	-
								205	6	1230
					145	6	870	200	6.50	1.300
								405		2530

13. Set up a "Stores ledger" form and enter the following transactions adopting the FIFO method of pricing out issues.

2015

September 1 Opening balance 100 units @ ` 4 per unit.

September 5 Issued out to production 40 units

September 7 Purchased 90 units @ ` 5 per unit

September 9 Issued out 40 units to production

September 19 Purchased 140 units @ ` 4 per unit

September 24 Received back into stores 38 units out of 40 units issued on 9th September 2015

September 27 Issued to production 20 units

Sol : **(Dec.-18, MGU)**

Stores Ledger (FIFO Method)

Date	Particulars	Receipts			Issues			Balance		
		Qty.	Rate	Amount	Qty.	Rate	Amount	Qty.	Rate	Amount
Sep. 1	To Opening stock	-	-	-	-	-	-	100	4	400
Sept. 5	To Issued	-	-	-	40	4.00	160	60	4.00	240
Sept. 7	To Received	90	5.00	450	-	-	-	60	4 00	240
Sept. 9	To Issue	-	-	-	40	4	160	20	4	80
								90	5	450
								40	4	160
Sept. 19	To Receive	140	4	560	-	-	-	20	4	80
								90	5	450
								40	4	160
								140	4	560
Sept. 24	To Returned	38	4	152	-	-	-	20	4	80
	stores							90	5	450
								40	4	160
								140	4	560
								38	4	152
Sept. 27	To Issue	-	-	-	20	4	80	90	5	450
								40	4	160
								140	4	560
								38	4	152

14. The following is a summary of receipts and issues of materials in a factory during a month in 2015.

Jan. 1 Opening balance 5000 units at Rs. 25 per unit

Jan. 3 Issue 250 units

Jan. 10 Received from supplier 400 units at Rs. 24.50 per unit.

Jan. 15 Retuned to store 20 units

Jan. 20 Issue 180 units

Jan. 24 Purchased 200 units at 25.50 per unit

Jan. 25 Issue 120 units

Jan. 26 Returned to store 15 units.

A physical verification taken on Jan 22 reveals a shortage of 5 units. Compute the material value as on 31st Jan. 2015 by using FIFO method.

Sol :

Stores Ledger Account [FIFO]

Date	Particulars	Receipts			Issues			Balance		
		Qty	Rate	Amount	Qty	Rate	Amount	Qty	Rate	Amount
Jan. 1.	To Balance	-	-	-	-	-	-	500	25	12,500
3	To Issue	-	-	-	250	25	6,250	250	25	6250
10	To Received	400	24.5	9,800	-	-	-	250	25	6,250
								400	24.5	9,800
15	To Returned to store	20	25	500	-	-	-	250	25	6,250
								400	24.5	9,800
								20	25	500
20	To Issue	-	-	-	180	25	4,500	70	25	1,750
								400	24.5	9,800
								20	25	500
22	To Shortage							65	25	1,625
					5	25	125	400	24.5	9,800
								20	25	500
24	To Purchases	200	25.5	5,100	-	-	-	65	25	1,625
								400	24.5	9,800
								20	25	500
								200	25.5	5,100
25	To Issue	-	-	-	65	25	1,625	345	24.5	8,453
					55	24.5	1,348	20	25	500
								200	25.5	5,100
26	To Returned	15	24.5	368	-	-	-	345	24.5	8,453
								20	25	500
								200	25.5	5,100
								15	24.5	368
				Closing stocks				580	-	14,421

15. The following is a summary of receipts and issues of materials in a factory during a month in 2015.

Jan. 1 Opening balance 1000 units at ` 5 per unit
Jan. 3 Issued 500 units
Jan. 9 Issued 300 units
Jan. 10 Received from supplier 400 units at ` 4.50 per unit
Jan. 15 Returned to store 20 units from goods issued on 3rd Jan.
Jan. 20 Issued 480 units
Jan. 24 Purchased 200 units at 5.50 per unit
Jan. 25 Issued 120 units
Jan. 26 Returned to store 15 units

A physical verification taken on Jan 22 reveals a shortages of 5 units. Compute the inventory value as on 31st Jan. by using LIFO method.

Sol :

Stores Ledger [LIFO Method]

Date	Particulars	Receipts			Issues			Balance		
		Qty.	Rate	Amount	Qty.	Rate	Amount	Qty.	Rate	Amount
Jan. 1.	To Balance	-	-	-	-	-	-	1000	5	5,000
3.	To Issued	-	-	-	500	5	2500	500	5	2500
9.	To Issued	-	-	-	300	5	1500	200	5	1000
10.	To Received	400	4.5	1800	-	-	-	200	5	1000
								400	4.5	1800
15.	To Returned	20	5	100	-	-	-	200	5	1000
								400	4.5	1800
								20	5	100
20.	To Issued	-	-	-	20	5	100	140	5	700
					400	4.5	1800			
					60	5	300			
22.	To Shortage	-	-	-	5	5	25	135	5	675
24.	To Received	200	5.5	1,100	-	-	-	135	5	67
								200	5.5	1,100
25.	To Issued	-	-	-	120	5.5	660	135	5	675
								80	5.5	440
26.	To Returned	15	5	75	-	-	-	135	5	675
								80	5.5	440
								15	5	75
						Balance		**230**		**110**

16. The following information is extracted from the stores ledger of lishanth industries, for the material item 786.

Purchases :

10-01-2014 : 2000 units @ Rs. 20 per unit

16-01-204 : 4,000 units @ Rs. 35 per unit

Issues :

20-01-2014 : 1,000 units

28-01-2014 : 2,000 units

Returns to stores :

29-01-2014 50 units

There was a stock verification on 31-01-2014 and found 2750 units in the stores. Record the above transactions in the stores ledger under LIFO stating clearly the treatment of shortage of material and returns.

Sol :

Stores Ledger [LIFO]

Date	Particulars	Receipts			Issues			Balance		
		Qty.	Rate	Amount	Qty.	Rate	Amount	Qty.	Rate	Amount
2014										
Jan 10th	To Purchases	2000	20.00	40,000	-	-	-	2000	20.00	40,000
Jan 16th	To Purchases	4000	35.00	1,40,000	-	-	-	2000	20.00	40,000
								4000	35.00	1,40,000
Jan 20th	To Issue	-	-	-	1000	35.00	35,000	2000	20.00	40,000
								3000	35.00	1,05,000
Jan 28th	To Issue	-	-	-	2000	35.00	70,000	2000	20.00	40,000
								1000	35.00	35,000
Jan 29th	To Returns.	50	35.00	1750	-	-	-	2000	20.00	40,000
								1000	35.00	35,000
								50	35.00	1750
Jan 31st	To Stock	-	-	-						
					50	35.00	1750	2000	20.00	40,000
					250	35.00	8750	750	35.00	26,250
Jan 31st	To Closing stock							2750		66,250

17. General Traders are the distributors for a certain brand of products. Following information is available for Jan. 2014.

Sales: Rs. 9,50,000

Administrative overheads: Rs. 20,000

Opening stock: 1,000 units @ Rs. 300 each

Purchases for the month:

Jan. 5th : 2,000 units @ Rs. 285 each

Jan. 22nd: 1,000 units @ Rs. 303 each

Closing stock on Jan. 31: 1,300 units

Compute

(i) Value of inventory on 31st January

(ii) Amount of cost of goods sold for January; and

(iii) Profit or Loss for January

Under

FIFO and LIFO methods.

Sol :

Calculation of Issue Units

Issue units = Opening stock units + Purchases unit – Closing stock units

= 1000 + [2000 + 1000] – 1300 = 2,700 units.

Stores Ledger [FIFO]

Date	Particulars	Receipts			Issues			Balances		
		Qty.	Rate	Amount	Qty.	Rate	Amount	Qty.	Rate	Amount
Jan 1st	To Opening stock							1000	300.00	3,00,000
Jan 5th	To Purchases	2000	285.00	5,70,000	-	-	-	1000	300.00	3,00,000
								2000	285.00	5,70,000
Jan 22nd	To Purchases	1000	303.00	3,03,000	-	-	-	1000	300.00	3,00,000
								2000	285.00	5,70,000
								1000	303.00	3,03,000
Jan 23rd	To Issue	-	-	-						
					1000	300.00	3,00,000			
					1700	2,85,00	4,84,500	300	285.00	85,500
								1000	303.00	3,03,000
Jan 31	Closing stock							1300		3,88,500

Stores Ledger [LIFO]

Date	Particulars	Receipts			Issues			Balances		
		Units	Rate	Rs.	Units	Rate	Rs.	Units	Rate	Rs.
Jan 1st	Opening stock							1000	300.00	3,00,000
Jan 5th	Purchases	2000	285.00	5,70,000	-	-	-	1000	300.00	3,00,000
								2000	285.00	5,70,000
Jan 22nd	Purchases	1000	303.00	3,03,000	-	-	-	1000	300.00	3,00,000
								2000	285.00	5,70,000
								1000	303.00	3,03,000
Jan 23rd	Issue	-	-	-	2700					
					1000	303.00	3,03,000	1000	300.00	3,00,000
					1700	2,85,00	4,84,500	300	285.00	85,500
Jan 31st	Closing stock							1300		3,85,500

Calculation of Cost of Goods Sold

Particulars	(Rs.) FIFO	(Rs.) LIFO
Opening stock	3,00,000	3,00,000
(+) Purchases		
Jan 5th	5,70,000	5,70,000
Jan 22nd	3,03,000	3,03,000
	11,73,000	11,73,000
(–) Closing stock	3,88,500	3,85,500
Cost of goods sold	7,84,500	7,87,500

Calculation of profit (or) Loss

Particulars	(Rs.) FIFO	(Rs.) LIFO
Sales	9,50,000	9,50,000
(–) Cost of goods sold	7,84,500	7,87,500
Gross Profit	1,65,500	1,62,500
(–) Administrative expenses	20,000	20,000
Profit	1,45,500	1,42,500

18. Show the stores ledger entries as would appear when using, (i) FIFO (ii) LIFO method of pricing issues in connection with the following transactions.

April 2012		Units	Value
1	Balance in hand B/F	300	600
2	Purchased	200	440
4	Issued	150	--
6	Purchased	200	460
12	Issued	150	--
20	Issued	200	--
25	Purchased	200	480
30	Issued	250	--

Sol :

Stores Ledger Account [FIFO]

Date	Particulars	Receipts			Issues			Balance		
		Qty.	Rate	Value	Qty.	Rate	Value	Qty.	Rate	Value
2012										
April. 1.	To Opening Balance	-	-	-	-	-	-	300	2.00	600
2.	To Purchases	200	2.20	440	-	-	-	300	2.00	600
								200	2.20	440
4.	To Issue	-	-	-	150	2.00	300	150	2.00	300
								200	2.20	440
6.	To Purchases	200	2.30	460	-	-	-	150	2.00	300
								200	2.20	440
								200	2.30	460
12.	To Issue	-	-	-	150	2.00	300	200	2.20	440
								200	2.30	460
20.	To Issue	-	-	-	200	2.20	440	200	2.30	460
25.	To Purchases	200	2.40	480	-	-	-	200	2.30	460
								200	2.40	480
30.	To Issue	-	-	-	250					
					200	2.30	460			
					50	2.40	120	150	2.40	360
30.	Closing balance							150		360

Stores Ledger [LIFO]

Date	Particulars	Receipts			Issues			Balance		
		Units	Rate	Value	Units	Rate	Value	Units	Rate	Value
2012										
April 1.	To Opening Balance	-	-	-	-	-	-	300	2.00	600
2.	To Purchases	200	2.20	440	-	-	-	300	2.00	600
								200	2.20	440
4.	To Issue	-	-	-	150	2.20	3.30	300	2.00	600
								50	2.20	100
6.	To Purchases	200	2.30	460	-	-	-	300	2.00	600
								50	2.20	110
								200	2.30	460
12.	To Issue	-	-	-	150	2.30	345	300	2.00	600
								50	2.20	110
								50	2.30	115
20.	To Issue	-	-	-	200	-	-	-	-	-
					50	2.30	115			
					50	2.20	110			
					100	2.00	200	200	2.00	400
25.	To Purchases	200	2.40	480	-	-	-	200	2.00	400
								200	2.40	480
30.	To Issue	-	-	-	250					
					200	2.40	480			
					50	2.00	100	150		300
30.	Closing balance							150	2.00	300

19. The following transactions occur in the Purchases and issue of materials

	Purchases	Issues
March 1st	**200 Units (5) Rs. 10 each**	**March 20th 160 Units**
March 4th	**50 Units @ Rs. 10.50 each**	**March 27th 160 Units**
March 15th	**100 Units (5) Rs. 11.00 each**	**March 30th 100 Units**
March 22nd	**100 Units @ Rs. 11.00 each**	
March 26th	**100 Units @ Rs. 11.50 each**	

Prepare the Stock Account showing the Balance on March 31st by using LIFO method.

Sol : **(July-21)**

Stores Ledge A/c (LIFO Method)

Date	Receipts			Issues			Balance		
	Qty (units)	Rate (`)	Amount (`)	Qty (units)	Rate (`)	Amount (`)	Qty (units)	Rate (`)	Amount (`)
March, 1	200	10	2,000				200	10	2,000
March, 4	50	10.50	525				200	10	2,000
							50	10.50	525
March, 5	100	11	1,100				200	10	2,000
							50	10.50	525
							100	11	1,100
March, 20				100	11	1,100			
				50	10.50	525	190	10	1,900
				10	10	100			
March, 22	100	11	1,100				190	10	1,900
							100	11	1,100
March, 26	100	10.50	1,050				190	10	1,900
							100	11	1,100
							100	10.50	1,050
March, 27				100	10.50	1,050	190	10	1,900
				60	11	660	40	11	440
March, 30				40	11	440	130	10	1,300
				60	10	600			

20. From the following information prepare a stores ledger by adopting the weighted average method and ascertain the value of the closing stock.

2011

April 1 Opening stock 600 units @ Rs. 30 per unit

April 4 Purchases 1200 units @ Rs. 40 per unit

April 6 Issued 1000 units

April 10 Purchased 1400 units @ Rs. 40 per unit

April 15 Issued 1600 units

April 20 Purchased 600 units @ Rs. 50 per unit

April 25 Issued 200 units

Sol :

Stores ledger A/c (Weighted Average Method)

Date	Particulars	Receipts			Issues			Balance	
		Qty.	Rate	Amount	Qty.	Rate	Amount	Qty.	Amount
2011									
Apr 1st	To Opening balance	–	–	–	–	–	–	600	18,000
Apr 4th	To Purchases	1,200	40.00	48,000	–	–	–	1,800	66,000
Apr 6th	To Issue	–	–	–	1,000	36.67	36,670	800	29,330
Apr 10th	To Purchases	1,400	40.00	56,000	–	–	–	2,200	85,330
Apr 15th	To Issue	–	–	–	1600	38.78	62,048	600	23,282
Apr 20th	To Purchases	600	50.00	30,000	–	–	–	1,200	53,282
Apr 25th	To Issue	–	–	–	200	44.40	8,880	1,000	44,402
Apr 30th	To Closing Stock							1,000	44,402

21. Prepare the Stores Ledger Account for the month of March 2012 under

(i) Weighted average price method.

(ii) Simple average method

Date	Particulars	Quantity (kg.)	Rate per Unit
March 2	Received	2000	10
6	Received	300	12
9	Issued	1200	—
10	Received	200	14
11	Issued	1000	—
22	Received	300	11
31	Issued	200	—

Sol :

(i) Stores Ledger (Weighted Average Method)

Date	Particulars	Receipts			Issues			Balance	
		Qty.	Rate	Amt.	Qty.	Rate	Amt.	Qty.	Amt.
Mar 2	To Received	2,000	10.00	20,000	–	–	–	2,000	20,000
" 6	To Received	300	12.00	3,600	–	–	–	2,300	23,600
" 9	To Issue	–	–	–	1200	10.26	12312	1100	11,288
" 10	To Received	200	14.00	2800	–	–	–	1300	14,088
" 11	To Issue	–	–	–	1000	10.83	10830	300	3,258
" 22	To Received	300	11.00	3300	–	–	–	600	6,558
" 31	To Issue	–	–	–	200	10.93	2186	400	4,372
" 31	To Closing Stock							400	4372

ii) Stores Ledger (Simple Average)

Date	Particulars	Receipts			Issues			Balance	
		Qty.	Rate	Amt.	Qty.	Rate	Amt.	Qty.	Amt.
Mar 2	To Received	2000	10.00	20,000	–	–	–	2,000	20,000
" 6	To Received	300	12.00	3600	–	–	–	2300	23,600
" 9	To Issue	–	–	–	1200	11.00	13,200	1100	10,400
" 10	To Received	200	14.00	2800	–	–	–	1300	13,200
" 11	To Issue	–	–	–	1000	12.00	12,000	300	1200
" 22	To Received	300	11.00	3300	–	–	–	600	4500
" 31	To Issue	–	–	–	200	12.33	2467	400	2033
" 31	To Closing Stock							400	2033

22. From the following information prepare a stores ledger under Simple Average Method of pricing of issues of materials.

2011

1 Feb. Purchased 150 units @ ` 30 per unit
4 Feb. Purchased 300 units @ ` 40 per unit
6 Feb. Issued 200 units
10 Feb. Purchased 300 units @ ` 50 per unit
15 Feb. Issued 500 units
20 Feb. Purchased 200 units @ ` 60 per unit
23 Feb. Issued 100 units.

Sol :

Stores Ledger (Simple Average Method)

Date	Particulars	Receipts			Issues			Balance		
		Qty	Rate	Amount	Qty	Rate	Amount	Qty	Rate	Amount
2011		`.	`.		`.	`.		`.	`.	
Feb. 1	Purchases	150	30.00	4,500	–	–	–	150	30	4,500
							150	30	4,500	
Feb. 4	Purchases	300	40.00	12,000	–	–	–	300	40	12,000
Feb. 6	Issues	–	–	–	200	35	7,000	250	–	9,500
							250	–	9,500	
Feb. 10	Purchases	300	50.00	15,000	–	–	–	300	50	15,000
Feb. 15	Issue	–	–	–	500	45	22,500	50	–	2,000
							50	–	2,000	
Feb. 20	Purchases	200	60.00	12,000	–	–	–	200	60	12,000
Feb. 23	Issue	–	–	–	100	55	5,500	150	–	8,500

∴ Closing stock = 150 units @ `. 56.67 per unit

i.e., `. 8,500/-

Workings :

Calculation of Simple Average price

Issue on Feb 6th → Simple Average price = $\frac{30+40}{2}$ = `. 35/-

Issue on Feb 15th → Simple Average price = $\frac{40+50}{2}$ = `. 45/-

Issue on Feb 23rd → Simple Average price = $\frac{50+60}{2}$ = `. 55/-

23. Prepare the stores ledger from the following transaction adopting the weighted average method simple average method.

1 Jan Opening bal. 400 units @ 2.00 Rs.
3 " Purchased 500 units @ 2.20 Rs.
8 " Issued 300 units
10 " Purchased 200 units @ of 2.40
12 " Issued 100 units
15 " Purchased 300 units @ 2.60
18 " Returned from dep. 50 units
21 " Issued 200 units
24 " Purchased 400 units @ 3.00
29 " Issud 300 units
30 " Stock lossed 50 units.

Sol :

Prepare a Store Ledger Under Simple Averge method (Simple Averge Method)

Date	Receipts			Issue			Balance		
	Qty.	Rate	Amount	Qty.	Rate	Amount	Qty.	Rate	Amount
Jan. 1	—	—	—	—	—	—	500	1.20	600
" 6	400	1.10	440	—	—	—	900	—	1040
" 10	300	1.20	360	—	—	—	1200	—	1400
" 11	—	—	—	300	1.17	351	900	—	1049
" 15	—	—	—	100	1.17	117	800	—	932
" 20	300	1.30	390	—	—	—	1100	—	1322
" 24	—	—	—	200	1.20	240	900	—	1082
" 25	500	1.40	700	—	—	—	1400	—	1782
" 28	—	—	—	200	1.25	250	1200	—	1532
" 30	50	1.25	63	—	—	—	1150	—	1595

Calculation of Simple Average Price

$$11^{th} \text{ Issue} = \frac{1.20 + 1.10 + 1.20}{3} = 1.7$$

$$15^{th} \text{ Issue} = \frac{1.20 + 1.10 + 1.20}{3} = 1.7$$

$$24 = \frac{1.20 + 1.10 + 1.20 + 1.30}{4} = 1.20$$

$$28 = \frac{1.10 + 1.20 + 1.30 + 1.40}{4} = 1.25$$

24. Prepare the Stores Ledger from the following transaction adopting the Weighted Average Method of Pricing out issues.

1st July Opening Balance 100 Units @ Rs. 6 per Unit

5th July Purchased 96 Units @ Rs.8 per Unit

7th July Issued out to Production 4 Units

9th July Issued out 40 Units to Production

19th July Purchased 152 Units @ 6 per Unit

25th July Received back into Stores 38 Units out of 40 Units issued on 9th July

28th July Issued to Production 20 Units.

Sol : **(July-21)**

Stores Ledger A/c (Weighted Averge Method)

	Receipts			Issues			Balance	
Date	Qty (units)	Rate (`)	Amount (`)	Qty (units)	Rate (`)	Amount (`)	Qty (units)	Amount (`)
July, 1							100	600
July, 5	96	8	768				196	1,368
July, 7				4	6.97 $\left(\frac{1368}{196}\right)$	27.88	192	1340.12
July, 9				40	6.97 $\left(\frac{1340.12}{192}\right)$	278.80	152	1,061.32
July, 19	152	6	912				304	1,973.32
July, 25	38	6.97	264.86				342	2,238.18
July, 28				20	6.54 $\left(\frac{2238.18}{342}\right)$	130.80	322	2,107.38

25. Following transactions are recorded in respect of Materials.

Date	Recovered Units	Date (Per unit)	Issued Quantity
3-12-2017	400	2.10	–
15-12-2017	500	2.20	–
20-12-2017	–	–	500
26-12-2017	600	2.50	–
28-12-2017	–	–	900

Prepare Stores Ledger by using Weighted Average Method.

Sol : **(July-19)**

STORES - LEDGER (Weighted Average Method)

Date 2017	Receipts Qty (Units)	Rate	`	Issues Qty (Units)	Rate	`	Balance Qty (Units)	`	Remarks
Dec-3	400	2.10	840				400	840	
,, 15	500	2.20	1,100				900	1,940	
,, 20				500	2.15	1,080	400	860	
,, 26	600	2.50	1,500				1,000	2360	
,, 28				900	2.36	2,124	100	236	Closing Balance

26. From the following details, prepare the Store Ledger using "Weighted Average" method of valuing the issues.

Nov. 2018

1 Opening Stock 2,000 units @ ` 5.00 each

3 Issued 1,500 units to production department

5 Received 4,500 units ` Rs. 6.00 each

10 Issued 1,600 units

12 Returned to stores 100 units by Production Department (from the issue of Nov. 3)

16 Received 2,400 units @ ` 6.50 each

19 Returned to supplier 200 units out of humanity received on Nov. 5.

20 Received 1,000 units @ ` 7.00 each

24 Issued to production 2,100 units

27 Received 1,200 units @ ` 7.50 each

29 Issued to production 2,800 units.

Ans : **(Dec.-19)**

Store ledger (Weighted average method)

Date	Particulars	Receipts			Issues			Balance		
		Qty.	Rate	Amount	Qty.	Rate	Amount	Qty.	Rate	Amount
2018										
Nov. 1	To Opening Stock	–	–	–	–	–	–	2,000	5	10,000
Nov. 3	To Issue	–	–	–	1,500	5	7,500	500	5	2,500
Nov. 5	To Received	4,500	6	27,000	–	–	–	5,000	5.9	29,500
Nov. 10	To Issue	–	–	–	1,600	5.9	9,440	3,400	5.9	20,060
Nov. 12	To Returned to store	100	5	500	–	–	–	3,500	5.87	20,560
Nov. 16	To Received	2,400	6.50	15,600	–	–	–	5,900	6.13	36,160
Nov. 19	To Returned	–	–	–	200	6	1,200	5,700	6.13	34,960
	To Supplier									
Nov. 20	To Receive	1,000	7	7,000	–	–	–	6,700	6.26	41,960
Nov. 24	To Issue	–	–	–	2,100	6.26	13,146	4,600	6.26	28,814
Nov. 27	To Received	1,200	7.50	9,000	–	–	–	5,800	6.52	37,814
Nov. 29	To Issue	–	–	–	2,800	6.52	18,256	3,000	6.52	19,558

27. From the following particulars prepare the stores ledger under weighted average price method.

October 1 Opening balance 500 units @ ` 9.50 per unit.

October 6 Issued 250 units

October 8 Received 250 units @ ` 8.75 per unit

October 13 Issued 350 units

October 19 Received 450 units @ ` 9.50 per unit

October 23 Issued 350 units

October 30 Received 350 units @ ` 9.40 per unit

Sol : **(Dec.-18 MGU)**

Stores Ledger (Weighted Average Price Method)

Date	Particular	Receipts			Issues			Balance		
		Qty.	Rate	Amount	Qty.	Rate	Amount	Qty.	Rate	Amount
Oct. 1	To Opening stock	-	-	-	-	-	-	500	9.50	4,750
Oct. 6	To Issue	-	-	-	250	9.50	2,375	250	9.50	2,375
Oct. 8	To Received	250	8.75	2,187	-	-	-	750	6.08	4,560
Oct. 13	To Issued	-	-	-	350	6.08	2,128	400	6.08	2,432
Oct. 19	To Received	450	9.50	4,275	-	-	-	850	7.89	6,707
Oct. 23	To Issue	-	-	-	350	7.89	2,761	500	7.89	3,946
Oct. 30	To Received	350	9.40	3,290	-	-	-	850	8.51	7,233.5

Exercise Problems

1. The components A and B are used as follows:

   Normal Usage: 50 Units per week each;

   Minimum Usage: 25 Units per week each;

   Maximum Usage :75 units per week each.

   Re-order Quantity: A: 300 units B: 500 units;

   Re-order period A: 4 to 6 weeks, B 2 to 4 weeks.

   Calculate for each component:

   (a) Re-order level, (b) Minimum level, (c) Maximum stock level, (d) Average stock level.

   [Ans: A (a) 450 (b) 200 (c) 650 (d) 350 units

   B (a) 300 (b) 150 (c) 750 (d) 400 units]

2. A company uses raw material 'A' for a product for which the following information is available.

   Re-order Quantity 10,000 kgs, usage per unit of product 10 kgs.

   Delivery period in weeks : Minimum 1, Average 2, Maximum 3

   Weekly Production varies from 175 to 225 units averaging 200 units. You are required to calculate:

   (a) Re-order level, (b) Maximum stock level, (c) Minimum stock level, (d) Average stock level

   [Ans :(a) 6,750 (b) 15,000 (c) 2,750 (d) 7,750 units]

3. Find out the Economic order quantity for raw materials and packing materials with the following data given to you:

   Cost of Ordering

   Raw Materials ` 1,000 per order

   Packing Materials ` 5,000 per order

   Cost of holding inventory

   Raw Materials lp. per unit p.m.

   Packing Materials 5 p. Per unit p.m.

   Production Rate 2,00,000 units per month

   [Ans : For both Materials : 2,00,000 units]

4. After inviting tenders, two quotations are received as follows:

   (a) ` 1.20 per unit; (b) ` 1.10 per unit plus ` 3,000 fixed charges to be added irrespective of units ordered. Advise with your arguments with whom orders to be placed and what quantity is to be ordered.

   [Ans : An order of above 30,000 units become economical for tender B]

5. From the following particulars, prepare the Stores ledger Account under two methods of pricing materials:

   (a) FIFO method, (b) Simple average. Find out the value of material on the last date of the month.

October	1	Opening balance 400 units @ ` 8 per unit
October	6	Issued 200 units
October	8	Received 250 units @ ` 8.50 per unit
October	13	Issued 300 units
October	19	Received 400 units @ ` 9.00 per unit
October	23	Issued 320 units
October	30	Received 300 units @ ` 8.80 per unit

   [Ans: (a) ` 4,710, (b) ` 4,690]

6. The following transactions occur in the preaches and issue of material

January	19th	Purchased 100 units @ ` 5.00 each
February	4th	Purchased 25 units @ ` 5.25 each
February	12th	Purchased 50 units @ ` 5.50 each
February	14th	Issued 80 units
March	6th	Purchased 50 units @ ` 5.50 each
March	20th	Issued 80 units
March	27th	Purchased 50 units @ ` 5.75 each

   Prepare the stock account showing the balance on March 31st the end of accounting year. State clearly your method of pricing and value of the closing stock.

   [Ans: ` 612.50]

7. Bharat Petroleum closes its accounts at the end of each month. The ' following information is available for the month of April 1983.

	`
Sales	5,00,000
Administrative expenses	40,000
Inventory : April 1st, 1983, 100 tons @ ` 1,000 per ton	1,00,000
Purchases	
April 10th, 200 units @ ` 900 per ton	1,80,000
April 10th, 200 units @ ` 900 per ton	1,60,000
Inventory : April 30th, 1983, 100 tons	

Compute the following data by the FIFO method:

(i) Inventory valuation on April 30 (ii) Cost of goods sold in April (iii) Profit or Loss for April

[Ans: (i) ` 80,000, (ii) ` 4,00,000, (iii) ` 1,00,000]

Short Question and Answers

1. Re-order Level

Ans :

It is the point at which if stock of a particular material in store approaches, the storekeeper should initiate the purchase requisition for fresh supplies of that materia.

Re-ordering level can be calculated by applying the following formula.

Ordering Level = Minimum Level + Consumption during the time required to get the fresh delivery.

2. Minimum Level

Ans :

This represents the minimum quantity of the material which must be maintained in hand at all times. The quantity is fixed so that production may not be held up due to shortage of the material.

Minimum Stock Level = Re-ordering level – (Normal Consumption × Normal Re-order Period.

3. Maximum Level

Ans :

It represents the maximum quantity of an item of material which car be neld in stock at any time. Stock should not exceed this quantity. The quantity is fixed so that there may be no overstocking.

Maximum Stock Level = Reordering Level + Re-ordering Quantity – (Minimum Consumption × Minimum Re-ordering Period).

4. EOQ

Ans :

EOQ stands for economic order quantity it also known as optimal quantity.

Economic order quantity is the size of the order which gives maximum economy in purchasing any material and ultimately contributes towards maintaining the material at the optimum level and at the minimum cost. It equates the cost of ordering with the cost of storage of materials.

Ordering cost : It mainly includes cost of stationery, salaries of those engaged in receiving and inspecting, salaries of those engaged in preparing the purchase orders, etc.

$$EOQ = \sqrt{\frac{2AO}{C}}$$

where

EOQ = Quantity to be ordered

A = Annual consumption of the material in units

O = Cost of placing one order including the cost of receiving the goods

C = Interest payments including cost of storage per unit per year.

5. ABC Analysis

Ans :

ABC technique is a value-based system of material control. In this technique of selective control, materials are analysed according to their value so that costly and more valuable materials are given greater attention and care. All items of materials are classified according to their value, i.e., high, medium and low values, which are known as A, B and C items respectively. ABC technique is sometimes called Always Better Control method.

'A' Items - These are high value items which may consist of only a small percentage of the total items handled. On account of their high cost, these materials should be under the tightest control and the responsibility of the most experienced personnel.

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

'C' Iems - These are low value materials which may represent a very large number of items. These materials should be under the simple and economic methods of control.

6. VED

Ans :

In addition to the conventional ABC analysis, VED analysis also plays an important role in material management. In VED analysis, materials are classified into three broad categories, namely V materials, 'E' materials, and 'D' materials. The classification of material items is on the basis of their criticality for the industry or company.

'V' stands for Vital material items in the sense that when these are out of stock or when not readily available, the production activity comes to a complete halt or is drastically affected.

'E' is for Essential items without which temporary losses of production or dislocation of production work occurs. Their stock-out cost is very high.

'D' denotes Desirable items i.e. all other items of materials which are necessary but do not cause any immediate effect on production.

7. JIT

Ans :

Just-in-time (JIT) System was first developed in the Toyota Motor Company in Japan. It is sometimes called as Zero Inventory System. It is a system under which materials are not purchased and kept in stock for future use but are purchased just in time i.e., immediately before these are required for use in production. According to CIMA London, JIT purchasing is 'matching receipt of materials closely with usage so that raw material inventory is reduced to near zero level'. This means in JIT approach a firm should maintain minimum level of inventory and rely on suppliers for parts and components 'just-in-time' to meet assembly / production requirements.

8. FSND

Ans :

In FNSD analysis, materials are classified according to their rate of consumption. This helps in controlling obsolescence of various material items. The classification is broadly into four groups as under:

F - are Fast moving materials which are consumed in a short span of time,

N - are Normal moving materials which are exhausted over a period of a year or so

S - are Slow moving materials, stock of which would last for more than one year, and

D - are Dead stock or non-moving materials. No further demand of such materials is foreseen.

9. Advantages of FIFO Method

Ans :

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

(ii) Materials are issued at the purchase price. Hence, the cost of jobs or work orders is correctly ascertained.

(iii) Materials are charged at actual cost to job, work orders, processes etc., hence balancing of stores ledger becomes easy. No adjustment for profit or loss is necessary because of arbitrary valuation of material issues.

(iv) It is a realistic method in as much as the material issues are made in the same order in which materials are received in the store.

(v) It tends to keep the value of inventory nearer to the current market price as well as at cost.

(iv) It is useful where transactions are not too many and price of materials is fairly steady.

10. Simple Average Method

Ans :

Simple Average Method is very easy to operate. It gives satisfactory results in case prices of purchases do not show marked fluctuations. This method suffers from several drawbacks. It does not charge actual cost of materials to production and therefore a profit or loss may arise merely on account of using this method. It does not take into consideration the quantity of materials purchased at different prices. Clerical work is also considerably increased at the time of every issue of material.

11. Weighted Average Price

Ans :

Weighted Average Price method is more scientific than the simple average price method as it takes both price and quantity into consideration. The average does not change with every issue of materials. It changes only when a fresh purchase is made. This method is frequently used and under normal circumstances gives the best results. However, the value of closing stock does not represent either the actual cost or current market price.

12. Disadvantages of LIFO Method

Ans :

(i) As in case of FIFO method, calculation becomes complicated and cumbersome when rates of the materials purchased are highly fluctuating.

(ii) Sometimes, more than one price must be adopted for pricing a single requisition. Costs of two similar jobs may differ because materials issued are charged at different rates.

(iii) It is not logical, as it is not according to physical flow of materials from the stores.

(iv) Materials are charged at the latest purchase price whereas issue of material generally takes place in order in which they are purchased.

Choose the Correct Answer

1. A store ledger card is similar to the _____ . [b]

   (a) Stock ledger (b) Bin card

   (c) Material card (d) Purchase requisition card

2. Which of the following element must be taken into account while calculating total earnings of a worker under different incentive wage schemes? [b]

   (a) Rate per unit

   (b) Units of production

   (c) Extra time taken by employee to complete the production

   (d) Number of workers employed

3. The cost of electricity bill of the factory is treated as: [d]

   (a) Fixed cost (b) Variable cost

   (c) Step cost (d) Semi variable cost

4. Weighted average cost per unit is calculated by which of the following formula? [b]

   (a) Cost of goods issued/number of units issued

   (b) Total Cost/Total Units

   (c) Cost of goods manufactured/closing units

   (d) Cost of goods sold/total units

5. The danger Level can be calculated? [a]

   (a) Average consumption x Lead time to get urgent supplies

   (b) Normal consumption x Lead time to get urgent supplies

   (c) Maximum consumption x Lead time to get urgent supplies

   (d) Minimum consumption x Lead time to get urgent supplies

6. Factory Over head cost includes : [d]

   (a) Factory Rent (b) Property Tax

   (c) Salaries of Factory Clerk (d) All of the given

7. What does FIFO mean? [d]

   (a) Finished stock In Finished stock out (b) Fabrications Inward Fabrications Outward

   (c) Final Input Final Output (d) First In First Out

8. The latest cost of inventories is changed to production but the old prices are changed to inventories on hand? [b]

(a) Average (b) LIFO

(c) FIFO (d) Perpetual

9. The inventories are recorded at the latest price but the production cost is changed old cost price? [a]

(a) FIFO (b) Average

(c) Both A & B (d) None

10. The average inventory costing method which results in a changed unit inventory cost after each successive purchase? [a]

(a) Weighted average (b) Moving average

(c) Specific cost (d) Simple average

Fill in the blanks

1. The term _____ denotes the commodities or substance supplied to factories with the objective of converting them into finished goods.
2. _____ is that aspect of materials management which is concerned with the physical storage of materials.
3. LIFO method is suitable in times of _____.
4. _____ is the systematic control concerned with procurement, storing and usage of materials.
5. EOQ stands for _____.
6. ABC stands for _____.
7. JIT stands for _____.
8. VED stands for _____.
9. _____ method assumes that every concern will maintain minimum quantity of stock.
10. LIFO method is suitable in times of _____.

ANSWERS

1. Materials
2. Storekeeping
3. Rising prices
4. Inventory control
5. Economic Ordering Quantity
6. Always Better Control
7. Just in Time
8. Vital, Essential and Desirable
9. Base Stock
10. Rising Prices

UNIT III

LABOUR AND OVERHEADS

Labour: Direct and Indirect Labour Cost – Methods of Payment of Wages (only Incentive Plans): Halsey, Rowan, Taylor Piece Rate and Merrick Multiple Piece Rate Methods.

Overheads: Classification - Methods of Allocation - Apportionment and Absorption of overheads.

3.1 LABOUR

3.1.1 Direct and Indirect Labour Cost

Q1. What do you mean by labour ? Explain about direct labour and indirect labour.

Ans :

Introduction

Labour or manpower represents human resources used in production. After material cost, labour cost is the second major element of cost. Inspite of large scale use of machinery and advanced technologies in manufacturing, the role of labour in production cannot be under estimated. So significant is the role of labour that productivity of all other resources depends on the productivity of human resources. In other words, higher efficiency of labour helps in lowering the cost per unit of production. There is, therefore, a special need for proper organization for accounting and control of labour cost.

Labour engaged in a factory may be classified into two types, Viz, (1) Direct labour and (2) Indirect labour. The classification of labour into direct and indirect is necessary for accurate ascertainment of costs. It helps in maintaining efficiency and Planning incentive schemes. It also facilitates interfirm comparison and provides a basis for control.

1. Direct Labour

Direct labour is that labour which is used for the manufacture of a specific article, process, job, etc. It refers to labour engaged in altering the construction, composition, conformation or condition of the product. In other words, it is the labour which can be conveniently identified with a particular cost centre or cost unit.

Labour can be considered to be direct labour if:

(a) It can be easily attributed to a specific job, contract, process or order

(b) Its cost can be identified with total cost of production.

(c) It varies proportionately with change in output

(d) It can be controlled.

The remuneration payable to direct labour is known as direct wages. According to ICMA, direct labour cost is "the cost of remuneration for employees, efforts and skills applied directly to a product or saleable service." It is the wages which is paid for those employees who actually convert raw materials into finished goods. The examples of direct labour are wages payable to furniture maker shoe-maker, baker, tailor, masons, drives, etc. Any wages paid to supervisors and other staff overseeing operations is not direct labour. However, even such expenses can be considered as direct labour if they are exclusively engaged for a particular product, process or order.

2. Indirect Labour

Labour that does not alter the construction, conformation, composition or condition of the product, but which contributes to the completion of the product is known as indirect

labour. It is the labour which serves as ancillary to the direct labour used in completing the production. The remuneration paid to indirect labour is termed as indirect wages. It is defined by the ICMA terminology as "wage cost other than direct wage cost." Examples of indirect labour are services of watchman, supervisor, inspector, foreman, cleaners, time keeping officers, storekeeper, general manager etc.

Indirect labour is secondary in importance as compared to direct labour. Its cost cannot be allocated but can only be apportioned. Indirect wage cost does not very much with the change in production and is relatively difficult to control. It cannot be identified with the finished product and is treated as overheads.

3.1.2 Labour Turnover

Q2. Discuss briefly about labour turnover ?

(OR)

What do you understand by labour turnover ?

Ans : **(July-19, Imp.)**

Labour turnover is thus defined as "the rate of change in the composition of the labour force in an organization." Labour turnover varies greatly between different trades and industries. For example, where part-time and seasonal labour is employed, the rate will be higher.

Measurement of labour turnover. To facilitate comparisons between different periods and different undertakings, labour turnover may be expressed in a rate.

There are three alternative methods by which this rate is computed. Once a particular method is used, it should be consistently followed for comparative analysis. The methods are :

1. **Separation method:** This method takes into account only those workers who have left the organization during a particular period. Its formula is:

$$\text{Labour Turnover Rate} = \frac{\text{No. of workers left during a period}}{\text{Average No. of workers during the period}} \times 100$$

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

Multiplication by 100 in the above formula indicates rate in percentage.

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

$$\text{Labour Turnover Rate} = \frac{\text{No. of workers replaced during the period}}{\text{Average No. of workers during the period}} \times 100$$

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

3. **Flux method:** This shows the total change, in the composition of labour force due to separations and replacement of workers. Its formula is:

$$\text{Labour Turnover Rate} = \frac{\text{No. of workers left} + \text{No. of workers replaced}}{\text{Average No. of workers}} \times 100$$

PROBLEMS ON LABOUR TURNOVER

1. From the following you are require to calculate labour turnover under separation, flux and replace method.

No. of Workers begining of year = 3800

No. of workers end of year = 4200

No. of workers left during year = 40

No. of workers discharge during period = 160

No. of workers recruited during period = 450

Sol :

(a) Labour turnover separation method :

$$\frac{\text{No. of workers left during year}}{\text{Average no. of workers during period}} \times 100$$

Average no. of workers during period :

$$\frac{\text{No. of workers begining of year + No. of workers end of year}}{2}$$

$$= \frac{3800+4200}{2} = \frac{8000}{2} = 4000$$

$$= \frac{40+160}{4000} \times 100 = \frac{200}{4000} \times 100$$

$$= 0.05 \times 100 = 5\%$$

(b) Labour turnover according flux method :

$$\frac{\text{No. of additions + No. of separations}}{\text{Average no. of workers}} \times 100$$

$$= \frac{450+(40+160)}{4000} \times 100$$

$$= \frac{450+200}{4000} \times 100$$

$$= \frac{650}{4000} \times 100 = 16.2\%$$

(c) Labour turnover according replace method :

$$\frac{\text{No. of workers replace year}}{\text{Average no. of workers}} \times 100$$

$$= \frac{450}{4000} \times 100 = 11.25$$

2. From the following information you are require to calculate labour turnover methods :

No. of workers beginning year	**4500**
No. of workers end year	**5500**
No. of workers left discharge period	**150**
No. of workers discharge period	**350**
No. of workers recruited discharge period	**600**

Sol :

(a) Labour turnover according to separation method :

$$\frac{\text{No. of workers left discharge year}}{\text{Average no. of workers}} \times 100$$

Average no. of workers :

$$\frac{\text{No. of workers begining of year + No. of workers end of year}}{2}$$

$$\frac{4500 + 5500}{2} = 5000$$

$$\frac{(150 + 350)}{5000} \times 100$$

$$\frac{500}{5000} \times 100 = 105$$

(b) Labour turnover according to flux method :

$$\frac{\text{No. of addition + No. of separation}}{\text{Average no. of workers}} \times 100$$

$$\frac{600 + (150 + 350)}{5000} \times 100$$

$$\frac{600 + 500}{5000} \times 100 \quad \frac{1100}{5000} \times 100 = 22\%$$

(c) Labour turnover according to replace method :

$$\frac{\text{No. of workers replace}}{\text{Average no. of workers}} \times 100$$

$$= \frac{600}{5000} \times 100$$

$$= 12\%$$

3. Calculate :

(i) Separation method, (ii) Flux method, (iii) Replace method

No. of workers beginning of year	**7200**
No. of workers end of year	**9800**
No. of workers left organization	**400**
No. of workers discharged	**500**
No. of workers recruited	**1200**

Sol :

(i) Labour turnover according separation method :

$$\frac{\text{No. of workers left discharge year}}{\text{Average no. of workers}} \times 100$$

Average no. of workers :

$$\frac{\text{No. of workers begining of year + No. of workers end of year}}{2}$$

$$= \frac{7200+9800}{2} = 8500$$

$$= \frac{(400+500)}{8500} \times 100$$

$$= \frac{900}{8500} \times 100 = 10.59\%$$

(ii) Labour turnover according flux method :

$$\frac{\text{No. of additions + No. of separations}}{\text{Average no. of workers}} \times 100$$

$$= \frac{450+(400+500)}{8500} \times 100$$

$$= \frac{450+900}{8500} \times 100$$

$$= \frac{1350}{8500} \times 100 = 15.88\%$$

(iii) Labour turnover according replace method :

$$\frac{\text{No. of workers replace}}{\text{Average no. of workers}} \times 100$$

$$\frac{1200}{8500} \times 100 = 14.12\%$$

4. From the following you are required to calculate labour turnover methods.

No. of workers at beginning 2400

No. of workers at end of year 2800

No. of workers left during period 200

No. of workers discharged 500

No. of workers recruited discharge period 750

Sol :

(i) Labour turnover under separation method :

$$\frac{\text{No. of workers left discharge years}}{\text{Average no. of employees}} \times 100$$

Average no. of employees :

$$\frac{\text{No. of workers begining of year + No. of workers end of year}}{2}$$

$$= \frac{2400 + 2800}{2} = 2600$$

$$= \frac{(200 + 500)}{2600} \times 100$$

$$= \frac{700}{2600} \times 100 = 26.92$$

(ii) Labour turnover under flux method :

$$\frac{\text{No. of separation + No. of additions}}{\text{Average no. of employees}} \times 100$$

$$= \frac{(200 + 500) + 750}{2600} \times 100$$

$$= \frac{1450}{2600} \times 100 = 55.77$$

(iii) Labour turnover under replace method :

$$\frac{\text{No. of workers replace discharge year}}{\text{Average no. of employees}} \times 100$$

$$= \frac{750}{2600} \times 100 = 28.85$$

3.2 METHODS OF PAYMENT OF WAGES

Q3. Explain briefly about various methods of payment of wages.

(OR)

Discuss about various incentives plans.

Ans : **(Dec.-18, Imp.)**

Methods of Wage Payment:

There are two main methods of wage payment (1) Time Rate system and (2) Price Rate system.

1. Time Rate System

The system under which the payment is made to workers according to the time for which they work is known as time rate system. For example, if the time rate is ` 5 per hour and a labourer works for 8 hours, he will earn wages of ` 40 (8 hours * ` 5 per hour).

Total Earnings = T×R = (Time Taken×Rate)

The Time rate is fixed beforehand, and workers are remunerated for the period of time for which work is done by them. The payment can be made according to rate per hour, day, week, fortnight or month. Under this method, no account is taken of the quantity of work done. However, expected output per unit of time is normally agreed upon by management and labour.

Advantages

(i) it is simple to understand

(ii) It is very easy to execute

(iii) It guarantees minimum wages to all workers

(iv) Workers prefer this method for its certainty

(v) Since remuneration is dependent on time spent on work, workers are reluctant to strike work. This helps in promoting better employer employee relationship

(vi) The method is most suitable for beginners.

Disadvantages

(i) Workers are not encouraged to work to the best of their efficiency

(ii) It encourages inefficiency as inefficiency leads to greater time, which result in more wages. Thus, greater the inefficiency, higher are the wages

(iii) Wages are paid not only for productive time, but also for the time when the workers were not working (idle time)

(iv) Additional cost of supervision needs to be incurred to ensure that workers are not wasting time

(v) Since efficient workers do not earn anything extra, they are likely to leave the organization. Thus, the general levels of efficiency are likely to be low

(vi) This method does not provide us reliable estimates of cost per unit, as cost is based on time, which cannot be determined with certainty.

2. Piece - Rate System

The Payment under this system is made according to the work done, with no regard to the time taken in performing the work. The rate is fixed for each unit produced, job completed, or operation performed. For example, if the piece rate is ` 2 per unit and a labourer has produced 25 units in a day of 8 hours, he will earn wages of ` 50 (25 pieces * ` 2 per piece). This can be represented as

Total Earnings

$$P \times R = \text{(Number of units produced} \times \text{Rate per unit)}$$

The piece rate is applied only to the good or complete units. Incomplete pieces and defectives are not considered for the purpose of calculating the wages due to a worker. The time taken to produce the units is not considered. Sometimes, piece rate may not be readily available. In such cases, it is calculated with the help of the following formula:

Piece Rate

$$= \frac{\text{Time rate per hour / per day}}{\text{Standard or Normal output per hour / per day}}$$

Advantages

(i) It is simple to understand

(ii) It is very easy to execute

(iii) It penalises inefficiency and encourages efficiency, as efficiency results in great output, which translates into higher wages

(iv) This method recognized and rewards merit. It clearly brings out the difference between efficient and inefficient workers

(v) It reduces conflict of interest between workers and management. This helps in promoting better employer employee relationship

(vi) The method provides reliable estimates of cost per unit.

Disadvantages

(i) The method does not guarantee minimum wages

(ii) It is highly intolerant of inefficiency, which may sometimes be beyond the control of the worker

(iii) Workers are likely to compromise on quality and concentrate on quantity

(iv) The success of the system depends on the rate that is fixed. If an optimistic estimate is made of expected production in a unit of time, the method will result in very low wages for workers

(v) Machines and tools get depreciated faster as workers are likely to compromise on Maintenance activity in order to gain more time to produce more units

(iv) Workers may overstrain themselves, leading to overall decline in efficiency.

3.2.1 Halsey, Rowan, Taylor Piece Rate and Merrick Multiple Piece Rate Methods.

Q4. Discuss briefly about various incentive plans.

Ans :

Incentive Plans

In order to eliminate the defects of both time rate and piece-rate systems, incentive plans are used. Incentive systems result in more wages for workers. They also save Overhead costs for the management. Most incentive systems guarantee a minimum wage. Workers are encouraged to work efficiently by offering additional wages for the efficiency exhibited by them. The additional wages are called incentives. Incentives are calculated in a manner that the gains of efficiency are shared by the workers as well as management.

(i) Halsey Premium Plan

Under this method, standard time for doing each job or work is fixed. The worker is given wages for the actual time taken by him to complete the work. If the worker completes the work before time, he is given a bonus for the time saved by him. The amount of bonus is usually 50% of the wages for the time saved. It may vary from 33% to 66% of wages for the time saved.

Total Earnings = T * R + % (S – T)R

where,

T = Time taken

S = Standard time

R = Rate per unit of time

Note : In case of Halsey Weir Incentive scheme, this percentage must be taken as $33^{1}/_{3}$%.

(ii) Rowan Plan

This method is similar to Halsey Plan. The only difference is in case of proportion of wages for time saved to be given to the worker. Under this method, the worker gets an hourly rate for the actual time taken by him to complete the work. He gets bonus if he completes the work before the standard

time. The bonus payable is the proportion of wages of time taken which the time saved bears to the standard time allowed. The amount of bonus is ascertained as follows:

Bonus

$$= \frac{\text{Time saved} \times \text{Time taken} \times \text{Hourly rate}}{\text{Standard time}}$$

Total Earnings = (Time taken × Hourly rate) + Bonus

(iii) Merrick Differential piece - rate system

This method attempts to make an improvement over Taylor's Differential piece-rate system. Under this method, three piece-rates are applied for workers with different levels of performance.

The rates of remuneration are :

Output Percentage Standard	Payment
(a) Upto 83%	Ordinary piece-rate
(b) 83% to 100%	110% of ordinary piece-rate
(c) Over 100%	120% or ordinary piece - rate

Thus, in order to decide the wages earned by a worker, we first need to calculate his output percentage standard. This is done by dividing the actual output of the worker in the standard time allotted by the standard output defined for the standard time.

(iv) Taylor Piece Rate

This system was introduced by Taylor, the father of scientific management. The underlying principle of this system is to penalise a slow worker by paying him a low piece rate fer low production and to reward an efficient worker by giving him a higher piece rate for a higher production. Taylor was of the view that an inefficient worker had no place in the organization and he should be compelled to leave the organization by paying him a low piece rate for low production. Taylor proceeded on the assumption that through time and motion study it is possible to fix a standard time for doing a particular task. To encourage the workers to complete the work within the standard time, Taylor advocated two piece rates, so that if a worker performs the work within or less than the standard time, he is paid a higher piece rate, and if he does not complete the work within the standard time, he is given a lower piece rate. Thus, if the standard production has been fixed at 8 units per day of 8 hours (taking normal piece rate as ` 1), the higher piece rate for 8 units or beyond may be ` 1.20 per unit and the lower rate for an output of less than 8 units per day, may be 80 P. per unit.

Hence, Taylor decided to give a large reward to those who would complete the work within or less than the standard time and much less wages to those who would not complete the job within the standard time. The system is very harsh to the inefficient workers because they earn much less wages on account of lower output and lower rate. Moreover, minimum wages are not guaranteed under this method. Another drawback of the system is that if a worker just fails to complete the work within the standard time earns much less wages than a worker who just completes the job within the standard time. Therefore, the system is now almost out of use.

PROBLEMS

5. On the basis of the following information, calculate the total earnings of a worker under Halsey Plan.

Standard Time = 15 hours

Time taken = 10 hours

Rate per hour = 3 Rs.

Sol : **(July-19)**

Total earnings = T × R + % (S – T) R

T = Time taken

R = Rate per unit

S = Standard time

10 Hrs × 3 + 50% (15 Hrs – 10 Hrs)3

$30 + \frac{1}{2} \times 5 \times 3 =$ ` 37.50

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6. From the following you are require to calculates workers wage according time basd, piece rate, Taylors differentiated, Merricks multiple piece rate system.

Normal wage rate per hr = 1.80 paise.

Standard time per one limit = 20 sec.

Standard time 8 hrs per day

Worker 'A' produced 1300 units per a day of 9 hours.

'B' produced 1500 units per day of 8 hours.

Sol :

(i) Time wages method

No. of hours worked × Standard Hourely Wage Rate

A → 9 × 1.80

= 16.20

B → 8 × 1.80

= 14.40

(ii) Piece Rate System

No. of hours worked × Standard piece rate

No. of units produced × Piece rate

Standard wage rate per hr = 1.80 paise

Standard time per one unit = 20 sec.

Standard output per min $\frac{60}{20} = 3$

Standard output per hour 60 × 3 = 180

$$\text{Piece rate} = \frac{1.80}{1.80} = 0.01$$

A → 1300 × 0.9 = 13.00

B → 1500 × 0.04 = 15.00

(iii) Taylor's differential piece rate systems

Standard time per one unit = 20 sec.

$$\text{Standard time per min} = \frac{60}{20} = 3 \text{ units}$$

Standard output per hr = 3 × 60

= 180 units.

Standard output 8 hrs = 180 × 8 = 1440 units.

Worker 'A' Wages

"A' produced 1300 units it is below the standard output of 1440 units. He will be treated inefficient workers. He will get low piece rate that is 20% of normal piece rate.

Wages

No. of units produced × Normal piece rate × 80%

$$1300 \times 0.01 \times \frac{80}{100}$$

= 10.40.

Worker 'B' Wages

'B' produced 15000 units it is above the standard output of 1440 units. He will treated efficient worker. He will get high piece rate that is 120% normal piece rate.

Wages

No. of units produced × N. piece rate × 120%

$$= 1500 \times 0.01 \times \frac{120}{100}$$

= 180.

(iv) Merrick's multiple piece rate system

Standard output per a day = 1440 units.

Worker 'A' Performance

1440 — 1300

100 — ?

$$\frac{100 \times 1300}{1400}$$

Worker 'B' Performance :

1440 — 1500

100 — ?

$$\frac{100 \times 1500}{1440} = 104.17\%$$

A's percentage = 90.28% it comes under second slap he will get 110% percent of normal percent.

A → No. of units produced × 110%, N.P. Rate.

$$= 1300 \times \frac{110}{100} \times 0.01$$

$$= 14.30$$

B's performance is 104.17% it comes under second slap he will get 120% percent of normal percent.

B → No. of units produced × 120% of normal piece rate

$$= 1500 \times 0.01 \times \frac{120}{100}$$

$$= 18\%$$

7. From the following you are require worker wage under 4 methods

Standard time = 8 hrs.

Standard rate per hr = 2.40 paise

Standard time = 20 sec per unit

A Produced 400 untis in 8 hours

B Produced 450 units in 9 hours

C Produced 550 units in 7 hours

D Produced 600 units in 8 hours.

Sol :

I. Time basis method

No. Hours Work × Standard Hourely Work Rate

A → 8 × 2.40 = 19.20

B → 9 × 2.40 = 21.60

C → 7 × 2.40 = 16.80

D → 8 × 2.40 = 19.20

II. Piece Rate System

No. of Units Produced × Piece Rate

Standard wage rate per hr = 2.40 paise

Standard time for one unit = 20 sec.

Standard output one min. $\frac{60}{20} = 3$

Standard time per hr = 3 × 60 = 180

Piece rate = $\frac{2.40}{180} = 0.013$

A → No. of units produced × Piece rate

A → 400 × 0.013 = 5.20

B → 450 × 0.013 = 5.85

C → 550 × 0.013 = 7.15

D → 600 × 0.013 = 7.80

III. Taylors differential piece rate system

Standard time one unit = 20 sec.

One min $\frac{60}{20} = 3$

Per hour = 3 × 60 = 180 units.

Standard output = 180 × 8 = 1440 units.

Worker 'A' Wages

'A' produced only 400 units below the standard output of 1440 unit it assumed that inefficient worker he will get 80% normal piece rate

No. of units produced × 80% of normal piece rate

$= 400 \times 0.013 \times \frac{80}{100}$

= 4.16

Worker 'B' Wages

'B' produced only 450 units below the standard output 1440 unit it assumed that inefficient workers he will get 80% normal piece rate.

No. of units produced × 80% of normal piece rate

$= 450 \times 0.013 \times \frac{80}{100}$

= 4.68

Worker 'C' Wages

'C' produced only 550 units below the standard output of 1440 unit it assumed that inefficient worker. He will get 80% of normal piece rate.

No. of units produced × 80% of normal piece rate

$$= 550 \times 0.013 \times \frac{80}{100}$$

$$= 5.12$$

Worker 'D' Wages

'D' produced only 600 units below the standard output of 1440 units it assumed that inefficient worker. He will get normal piece rate.

$$= 600 \times 0.013 \times \frac{80}{100}$$

$$= 6.24$$

IV. Merrick's multiple piece rate system

Standard output per day = 1440 units

Worker 'A' Performance

1440 — 400

100 — ?

$$\frac{400 \times 100}{1440} = 27.78$$

Worker 'B' Performance

1440 — 450

100 — ?

$$\frac{450 \times 100}{1440} = 31.25$$

Worker 'C' Performance

1440 — 550

100 — ?

$$\frac{100 \times 550}{1440} = 38.19$$

Worker 'D' Performance

1440 — 600

100 — ?

$$\frac{100 \times 600}{1440} = 41.67$$

8. A worker under the Halsey method of remuneration has a day rate of Rs.24 per week of 48 hours, plus a cost of Living Allowance of 20 paise per hour worked. He is given 8 hours task to perform. Which he complete in 6 hours. He is allowed 30% of time saved as Premium Bonus. What would be his Total and Hourly Rate of Earning?

Sol : **(July-21)**

Total Earning of a worker

T.E = T × R% + (S – T) R

$6 \times 0.50 + \frac{30}{100}(8 - 6)\ 0.50$

$3 + \frac{3}{10} \times 2 \times 0.50$

$3 + \frac{3}{10} \times 1 = 3.30$

(+) Living allowance

6 hours @ 0.20 per hour = 1.20

4.50

Hourly rate of earnings = $\frac{4.50}{6\ \text{Hrs}}$ = 0.75

Note : Calculation of rate per hour

Four 48 hours – ` 24

For Hour – ? $\frac{1 \times 24}{48}$ = 0.50 Per hour.

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9. From the following you are require to calculate worker wages under Halsey and Rowan premium plan ?

Standard time allowed 48 hrs.

Standard hourly worker rate 2 Rs

Worker 'A' completed in 40 hrs

Worker 'B' completed in 36 hrs.

Sol :

I. Halsey Premium Plan

Standard time = 48 hrs

Standard hours = 2 Rs

Wages = No. of hours worked × Hourly Worker Rate

A → 40 × 2 = 80

Bonus = Saving time × Hourly Worker Rate × 50%

$$8 \times 2 \times \frac{50}{100} = 8$$

Total 88

Worker 'B'

Wages = No. of Hours Worked × Hourely Work Rate

36 × 2 = 72

Bonus = S. Time × H.W.R × 50%

$$12 \times 2 \times \frac{50}{100} = 12$$

Total 84

II. Rowan Premium Plan

Worker 'A'

Wages = No. of Hours Worked × Hourely Work Rate

40 × 2 = 80

$$\text{Bonus} = \frac{\text{Time saved}}{\text{Standard time}} \times \text{Hourely W.Rate} \times \text{No. hrs worked}$$

$$\frac{8}{48} \times 2 \times 0.40 = 13$$

Total 93

Worker 'B'

Wages = 36 × 2 = 72

$$\text{Bonus} = \frac{12}{48} \times 2 \times 36 = 18$$

Total 90

10. From the following you are require to Halsey & Rowan premium plan.

Standard time allowed job = 20 hrs

Standard hourly wage = 1.50 paise

A completed job in 15 hrs

B completed job in 18 hrs

C completed job in 20 hrs

Sol :

I. Halsey Premium Plan

= No. of hours worked × Hourly wage rate

Bonus = Saving time × Hourly worked rate × 50%

Workers 'A'

Wage = 15 × 1.50 = 22.50

Bonus = $5 \times 1.50 \times \frac{50}{100}$ = 3.57

Total = 26.25

Workers 'B'

Wage = 18 × 1.50 = 27.00

Bonus = $2 \times 1.50 \times \frac{50}{100}$ = 1.50

Total = 28.50

Workers 'C'

Wage = 20 × 1.50 = 30.00

Bonus = $0 \times 1.50 \times \frac{50}{100}$ = 0

Total = 30.00

II. Rowans Premium Plan

= No. of hours × Hourly wage rate

$$\text{Bonus} = \frac{\text{Time saved}}{\text{Standard}} \times \text{Hourly wage rate} \times \text{No. of hrs worked}$$

Workers 'A'

Wages = 15 × 1.50 = 22.50

Bonus = $\frac{5}{20} \times 1.50 \times 15$ = 5.62

Total : = 28.12

Workers 'B'

Wages = 18 × 1.50 = 27.00

Bonus = $\frac{2}{20}$ × 1.50 × 18 = 2.7

Total : = 29.7

Workers 'C'

Wages = 20 × 1.50 = 30.00

Bonus = $\frac{0}{20}$ × 1.50 × 20 = 0

Total : = 30.00

11. From the following calculate under Halsey premium plan.

Standard time to complete job = 96

Standard hourly work rate = 3 Rs

A completed that job = 80 hrs

B completed that job = 90 hrs

C completed that job = 96 hrs

Sol :

I. Halsey Premium Plan

= No. of hours worked × Hourly wage rate Bonus

= Saving time × Hourly worked rate × 50%

Worker 'A'

Wage = 80 × 3 = 240

Bonus = 16 × 3 × $\frac{50}{100}$ = 24

Total 264

Worker 'B'

Wage = 90 × 3 = 270

Bonus = 6 × 3 × $\frac{50}{100}$ = 9

Total 279

Worker 'C'

Wage = 96 × 3 = 288

Bonus = $0 \times 3 \times \frac{50}{100}$ = 0

Total 288

II. Rowans Premium Plan

= No. of hours × Hourly wage rate

Bonus = $\frac{\text{Time saved}}{\text{Standard}}$ × Hourly wage rate × No. of hrs worked

Worker 'A'

Wage = 80 × 3 = 240

Bonus = $\frac{16}{96} \times 80 \times 3$ = 41

Total 281

Worker 'B'

Wage = 90 × 3 = 270

Bonus = $\frac{6}{96} \times 3 \times 90$ = 16.88

Total 286.88

Worker 'C'

Wage = 96 × 3 = 288

Bonus = $\frac{0}{96} \times 3 \times 96$ = 0

Total 288

12. From the following you are require to calculate piece rate system (straight), Taylors differential piece rate system, Halyes premium plan, Rowon premium plan.

6 hours per week = 48

Hourly wage rate = 3.75 paise

Piece rate = 1.50 paise

Standard time per one unit = 20 mins.

Standard output = 120 units

Actual output for week = 150 units.

Sol :

(i) Piece Rate

No. of units produced × Piece rate

$150 \times 1.50 = 225$

(ii) Taylors differential system

In the above problem standard output 120 units but actual production 150. Here more efficient worker he will get high piece rate that is 120%.

No. of units produced × N. P. Rate 120%

$$150 \times 1.50 \times \frac{120}{100}$$

$$= \underline{\overline{270}}$$

(iii) Halsay Premium Plan

Wage = No. of hours produced × Hourly work rate

Standard time = 48 hrs

Standard hourly work rate = 3.75 paise

No. of hrs worked

$$= \frac{\text{A. Production} \times \text{S. time}}{1 \text{ min.}}$$

$$= \frac{150 \times 20}{60}$$

= 50 hours.

Wage = 50 × 3.75 = 187.50

Bonus = $0 \times 3.75 \times \frac{50}{100}$ = 0

Total : = $\underline{\overline{187.50}}$

13. On the basis of the following information, calculate the total earnings of a worker under Halsey and Rowan plans.

Standard time = 15 hours, Time taken = 10 hours

Rate per hour = ` 3 per hour.

Sol :

Total earning under Halsey Plan = T × R + % (S – T) R

T = 10 hours, S = 15 hours, R = ` 3 per hour

Percentage of bonus is taken at 50, whenever it is not specifically stated.

Total earnings = 10 × 3 + 50% × (15 – 10) × 3 = 30 + 7.50 = ` 37.50

14. Rate per hour = ` 1.50 per hour ; Time allowed for job = 20 hours ; Time taken = 15 hours.

Calculate the total earnings of the worker under the Halsey Plan. Also find out effective rate of earning.

Sol :

S (Standard time) = 20 hours

T (Time taken) = 15 hours

R (Rate) = ` 1.50 per hour

Total Earnings = T × R + 50% (S – T) × R

$$= 15 \times ` 1.50 + \frac{50}{100} (20 - 15) \times ` 1.50$$

= ` 22.50 + ` 3.75 = ` 26.25

Total wages for 15 hours = ` 26.25

Therefore, effective rate of earning per hour

$$= \frac{\text{Total Wages}}{\text{Actual Time Taken}} = \frac{` 26.25}{15} = ` 1.75$$

Note : Percentage of bonus is to be taken 50% when it is not given.

15. From the following particulars calculate the total amount of wages payable under

(i) Halsey and

(ii) The Rowan premium plans

Standard time : 10 hrs.

Wage rate per hour: Rs. 5

Time taken : 8 hours.

Sol :

Given T = Time taken = 8 hrs.

S = Std Time = 10 hrs.

R = Rater per hr = Rs. 5

P = Percentage (50%)

E = Earnings

(i) Halsey Premium Plan

$E = T \times R + [P[S - T]\ R]$

$= 8 \times 5 + \left[\frac{50}{100}[10 - 8]\ 5\right] = 40 + \left[\frac{50}{100}[2]\ 5\right]$

$= 40 + \left[\frac{50}{100} \times 10\right] = 40 + 5 = \text{Rs. } 45$

(ii) Rowan Premium Plan

$E = T \times R + \left[\frac{S - T}{S}\right] T \times R$

$= 8 \times 5 + \left[\left[\frac{10 - 8}{10}\right] 8 \times 5\right]$

$= 40 + \left[\frac{2}{10} \times 40\right] = 40 + 8 = \text{Rs. } 48.$

16. From the following particulars work out the earnings for the week of a worker under,

(i) Halsey premium plan

(ii) Rowan system

Number of working hours per week	**: 48**
Wages per hour	**: ` 3.75**
Rate per piece	**: ` 1.50**
Normal time per piece	**: 20 minutes**
Normal output per week	**: 120 pieces**
Actual output per week	**: 150 pieces**

Differentials applied are 80% of normal piece rate below standard and 120% at and above standard.

Sol :

(i) Earning under the Halsey Premium Plan

Time allowed for 150 pieces @ 20 minutes perpiece = 50 hours.

Time taken = 48 hours.

Time saved (50 – 48) = 2 hours

Rate per hour = 3.75 Rs.

Earnings = Wages for time taken + Wages for 50% of time saved.

$$= 48 \times 3.75 + \frac{50}{100} \times 2 \times 3.75$$

$$= 180 + 3.75 = 183.75$$

(ii) Earning under the Rowan system

$$= T \times R + \frac{S - T}{S} \times T \times R$$

$$= 48 \times 3.75 + \frac{50 - 48}{50} \times 48 \times 3.75$$

$$= 180 + 7.2 = 187.20$$

17. A worker takes 9 hours to complete a job on daily wages and 6 hours on a scheme of payment by results. His day rate is 75 paise an hour. The material cost of the product is Rs. 4 and the over heads are recorded at 50% of the total direct wages. Calculate the factory cost of the product under (a) piece work plan (b) Rawan plan (c) Halsey plan.

Sol :

(i) Rown's Plan

$$E = (T \times R) + \left(\frac{S - T}{S}\right) \times (T \times R)$$

E = Earnings of worker

T = Time taken = 6 hrs

R = Rate per hr = 0.75

S = Standard Time = 9 hrs

$$E = (6 \times 0.75) + \left(\frac{9 - 6}{9}\right) \times (6 \times 0.75)$$

$$= 4.5 + \frac{3}{9} \times 4.5$$

$$= 4.5 + \frac{13.5}{9}$$

$$E = 4.5 + 1.5 = \text{Rs. } 6.$$

(ii) Halsey Plan

E = (T × R) + [R [S – T] × R]

T = Time taken = 6 hrs

S = Standard time = 9 hrs

P = percentage = 50%

R = Rate per hour = 0.75

$$E = (6 \times 0.75) + \left(\frac{50}{100}(9-6)\times 0.75\right)$$

$$= 4.5 + \left(\frac{50}{100}(3\times 0.75)\right) = 45. + \left(\frac{50}{100}(2.25)\right)$$

= 4.5 + 1.13

E = Rs. 5.63

Piece Work Plan = 6 × 0.75 = Rs. 4.5

Particulars	Calculation of Factory Cost		
	Rowan	Halsey	Piece work
Materials	4.00	4.00	4.00
(+) wages	6.00	5.63	4.50
Prime cost	10.00	9.63	8.50
(+) Factory expenses [150% of Direct wages]	9.00	8.45	6.75
Factory cost	19.00	18.08	15.25

18. From the following particulars, calculate the earnings of P and Q on the Straight Piece Rate basis and Taylor's Differential Piece Rate System. Standard Production is 16 Units per hour and normal time rate 0.80 paise per hour. In a 9 hour day 'P' produced 108 Units, Q produced 150 Units. Differentiate to be applied (i) 80% of piece rate at below standard and (ii) 120% of piece rate at or above standard.

Sol : **(July-21)**

Calculation of Earnings

Worker – P

i) Under piece rate system

108 units × 0.05 Ps per unit = ` 5.40

ii) Under Taylor's differential piece rate system

$$108 \text{ units} \times 0.05 \times \frac{80}{100} = ` 4.32$$

Worker – Q

i) Under piece rate system

150 units × 0.05 Ps per unit = ` 7.50

ii) Under Taylor's differential piece rate system

$$150 \text{ units} \times 0.05 \times \frac{120}{100} = ` 9$$

Work Notes :

1. Calculation of standard production in a day

16 units per hour × 9 hours = 144 units

2. Calculation of piece rate normal rate per hour

$$\text{Standard production per hour} = \frac{0.80 \text{ N.P}}{16 \text{ units}} = 0.05 \text{ piece rate}$$

---

19. Calculate the Earnings of a worker from the following information.

(a) Time Rate Method

(b) Halsey Plan and

(c) Rowan Plan

Standard Time = 30 hours

Time taken = 20 hours7

Hourly rate = 1 Re per hour plus Dearness Allowance Rs. 0.50 Paise per hour worked.

Sol : **(July-19)**

(a) Time Rate Method

T × R		`
20 Hrs × 1 Per hour	=	20 = 00
Add : Dearness Allowance		
20 Hrs × 0.50 Per hour	=	10 = 00
		30 = 00

(b) Halsey Plan

T × R + % (S – T) R		`
20 Hrs × Per hour + 50% (30 Hrs – 20 Hrs) 1 Per hour		
$20 + \frac{1}{2}(10)1$		
$20 + \frac{1}{2}(10)$	=	25 = 00
Add : Dearness Allowance		
20 Hrs × 0.50 Per hour	=	10 = 00
		35 = 00

(c) Rowan Plan :

$$T \times R + \frac{\text{Time Saved}}{\text{Standard Time}} \times T \times R$$ `

20 Hrs × 1 Per hour + $\frac{10 \text{ Hrs}}{30 \text{ Hrs}}$ × 20 Hrs × 1 Per hour

$20 + \frac{1}{3} \times 20$ = 26.67

Add : Dearness Allowance

20 Hrs × 0.50 Per hour = 10 = 00

36 = 67

Note :

T = Time taken

S = Standard time

R = Rate per hour of time taken

20. A worker takes 48 hours to do a job for which the time allowed is 60 hours. His wage rate is Rs.10 per hour.

Calculate the works cost of the job under the following methods of payment of wages

(a) Halsey plan

(b) Rowan Plan

Additional Information

Material Cost ` 1,000

Overheads @ 150% of wages

Sol : **(Dec.-19)**

(a) Halsey plan

Total Earnings = Total wages for actual time + Bonus

Total wages for actual time = Time taken × Time rate

= 48 × 10 = 480

Bonus = 50 % fo Time Saved × Time rate

Time saved = 60 – 48 = 12 hours

Bonus = $12 \times 10 \times \frac{50}{100}$

= 60 `

Total Earnings = 480 + 60 = 540

(b) Rowan Plan

Total Earnings = Total wage for actual time + Bonus

$$\text{Bonus} = \frac{\text{Time saved}}{\text{Standard time}} \times \text{Total wages for actual time}$$

$\frac{12}{60} \times 480 = 96$

Total = 480 + 96 = 576.

21. From the following particulars, calculate earnings of two workers (A & B) who are paid wages under Merriek differential system.

Normal piece rate (upto 83%) Rs. 5 per unit

Task rate is 40 units per week

Output of the workers : A – 32 units

B – 42 units

Sol : **(Dec.-18)**

Working Notes

Calculation of % of output of workers

Worker - A

Standard output if is 40 units – produced 32 units

100 – ?

$$\frac{32}{40} \times 100 = 80\%$$

Worker - B

Standard output if is 40 units – produced 42 units

100 – ?

$$\frac{42}{40} \times 100 = 105\%$$

Earnings of workers

Worker - A

As his % of output is 80% which is less than 83%, so he will get ordinary piece rate

32 units × 5 P. U = ` 160/-

Worker - B

As his % of output is 105%, which is above 100%, he will get 120% of ordinary piece rate

42 units × 5 P.U ×120% = ` 252

---

22. From the following particulars, calculate the earnings of 2 workers A and B who are paid wages under the Merrick Differential System.

Normal piece rate (upto 83% of high task output) ` 40 per unit. High task rate 40 units per week. Output of the workers for the week: A-32 units, B-42 units.

Sol : **(Dec.-18(KU)**

Normal piece rate = 40 ` per unit

High Task rate = 40 units per week

Output for worker A = 32 units per week.

Output for worker B = 42 units per week.

Efficiency Level

Worker 'A'

$$= \frac{\text{Output}}{\text{High Task Rate}} \times 100 = \frac{32}{40} \times 100 = 80\%$$

The efficiency level is achieved below 83% normal piece rate is applicable ` 40 = 32 × 40 = 1280.

Worker 'B'

$$= \frac{42}{40} \times 100 = 105\%$$

The efficiency level is achieved is more than 100%. Therefore a high differential piece rats @ 120%.

$$= \frac{40 \times 120}{100} = 48 \text{ per piece}$$

$$= 42 \times 48 = 2016$$

23. Based on the following information, calculate the earning of P, Q, R and S under Merrick's multiple piece rate system. Standard production per hour 12 units. Normal rate ` 0.80 per hour. In an 8 hour day. P produces 75 units, Q produces 85 units, R 99 units and S 105 units.

Sol : **(Dec. -18(MGU)**

Standard production per hour = 12 units

Normal rate per hour = 0.80

$$\text{Piece rate} = \frac{0.80}{12} = 0.067 \text{ Paise}$$

Particulars	P	Q	R	S
Actual production	75	85	99	105
Standard production (12× 8)	96	96	96	96
Efficiency level	$\frac{75}{96} \times 100$	$\frac{85}{96} \times 100$	$\frac{99}{96} \times 100$	$\frac{105}{96} \times 100$
	78.12%	88.54%	103.12%	109.37%

Statement showing under Merrick's Multiple

Particular	P	Q	R	S
Efficiency level	78.12%	88.54%	103.12%	109.37%
Applicable wages rate	0.067	0.0737	0.0804	0.0800
Production	75	85	99	105
Earnings	5.025	6.264	7.920	8.40

3.3 OVERHEADS

3.3.1 Classification

Q5. Define overheads. State the classification of overheads ?

OR

How do you classify of overheads? Discuss briefly.

Ans : **(July-21, Dec.-18, Imp.)**

Definitions

(i) According to CIMA defines indirect cost as "expenditure on labour, material or services which cannot be economically identified with a specific saleable cost per unit".

(ii) According to Wheldon defines overheads as "the cost of indirect materials, indirect labour and such other expenses, including services, an cannot conveniently be charged directly to specific cost units".

(iii) In simple words, overheads are all costs other than direct costs. All costs incurred over and above the prime cost are overheads. The terms 'burden', supplementary costs', 'on costs', 'indirect costs', 'non productive costs', 'loading' are used interchangeably for overheads.

Cost pertaining to a cost centre or cost until may be divided into two portions direct and indirect. The indirect portion of the total cost constitutes the overhead cost which is the aggregate of indirect material cost, indirect wages and indirect expenses. CIMA defines indirect cost as "expenditure on labour, materials or services which cannot be economically identified with a specific saleable cost per unit". Indirect costs are those costs which are incurred for the benefit of a number of cost centres or cost units. Indirect cost, therefore, cannot be conveniently identified with a particular cost centre or cost unit but it can be apportioned to or absorbed by cost centres or cost units.

Fixed Overheads and Variable Overheads

Overheads may also be classified into (i) Fixed Overheads (ii) Variable Overheads and (iii) Semi-Variable Overheads.

1. Fixed Overheads

Overheads are generally fixed for a period of time. They remain unaffected by changes in volume or production or sale. Fixed Overhead cost per unit decreases with increase in volume of activity and increases with a decline in volume of activity. They have to be incurred for a particular period irrespective of whether there is more or less production. Rent of Building and Manager's Salary are examples of Fixed expenses. Fixed expenses are not absolutely fixed at all times. If the organization increase production capacity by adding equipment or staff, Fixed expenses will go up.

2. Variable Overheads

Overheads costs that vary in direct proportion to changes in volume of production or sales are known as Variable Expenses. They increase or decrease in amount as the volume of activity rises or falls. The cost per unit tends to remain constant. Electricity expenses and Consumables are examples of Variable Overheads Semi-Variable Overheads

3. Semi-Variable Overheads

Semi-Variable Overheads are partly fixed and partly variable. These expenses either

(i) do not change when there is a small change in level of activity or

(ii) Change in the same direction as the change in level of activity, though not in the same proportion.

3.3.2 Methods of Allocation

Q6. Explain briefly about allocation and apportionment of overheads and the bases for both allocation and apportionment.

Ans : **(Imp.)**

Allocation means charging the full amount of overhead cost to a cost centre, e.g., to a department, to a process, etc. It has been defined as "the allotment of whole items of cost to cost centres or cost units." Allocation depends on the nature of cost. If a particular item of cost can be easily identified to a particular cost centre, it is allocated. For example, salary of a foreman in a production department can be easily identified and allotted to this department. Similarly, salary of a timekeeper can be easily allotted to time-keeping department. Other examples of items which are allocated are indirect materials, depreciation of machinery, idle time cost, overtime cost, etc.

Apportionment is "the allotment of proportions of items of cost to cost centres or cost units." Where an item of cost is common to various cost centres, it is allotted to different cost centres proportionately on some equitable basis. For example, rent of factory building is not allocated but apportioned to various departments on some suitable basis, i.e., area occupied by departments concerned. Similarly, salary of a general manager cannot be allocated wholly to any one department as he attends in general to all the departments. It should, therefore, be apportioned on some equitable basis.

Bases of Apportionment of Overhead

Different items of overhead are apportioned on different bases. Some of the common bases of apportionment of different items of overhead are illustrated in the following table :

	Overhead Cost	Bases of Apportionment
1.	(i) Rent and other building expenses	Floor area, or
	(ii) Lighting and heating	Volume of department
	(iii) Fire precaution service	
	(iv) Air condition	
2.	(i) Fringe benefits	Number of workers
	(ii) Labour welfare expenses	
	(iii) Time-keeping	
	(iv) Personnel office	
	(v) Supervision	
3.	(i) Compensation to workers	Direct wages
	(ii) Holiday pay	
	(iii) ESI and PF contribution	
	(iv) Fringe benefits	
4.	General overhead	Direct labour hours, or
		Direct wages, or Machine hours
5.	(i) Depreciation of plant and machinery	Capital values
	(ii) Repairs and maintenance of plant and machinery	
	(iii) Insurance of stock	

6.	(i) Power/steam consumption	Technical estimates
	(ii) Internal transport	
	(iii) Managerial salaries	
7.	Lighting expenses	No. of light points, or Area
8.	Electric power	Horse power of machines, or Number of machine hours, or Value of machines
9.	(i) Material handling	Weight of materials, or Volume of
	(ii) Stores overhead	materials, or Value of materials

3.3.3 Apportionment and Absorption of overheads

Q7. What do you understand by reapportionment ? Write about the basis and various methods of reapportionment ?

Ans : **(Imp.)**

Service department costs are to be reapportioned to the production departments or the cost centres where production is going on. This process of re-apportionment of overhead expenses is known as 'Secondary Distribution'. Following is a list of the bases of apportionment which may be accepted for the service departments noted against each :

S.No.	Service Department Cost	Basis of Apportionment
1.	Maintenance department	Hours worked for each department.
2.	Payroil or time-keeping department.	Total labour or machine hours or number of employees in each
3.	Employment or personnel department	Rate of labour turnover or number of employees in each department.
4.	Store-keeping department	No. of requisitions or value of materials of each department.
5.	Purchase department	No. of purchase orders or value of materials for each department.
6.	Welfare, ambulance, canteen service, recreation room expenses	No. of employees in each department,
7.	Building service department	Relative area in each department.
8.	Internal transport service or overhead crane service	Weight, value graded product handled, weight and distance travelled.
9.	Transport Department h	Crane hours, truck hours, truck mileage, truck tonnage, truck tonne-ours, tonnage handled, number of packages.
10.	Power House (Electric power cost) electric points etc.	Wattage, horse power, horse power machine hours, number of
11.	Power House	Floor area, cubic content

Methods of Re-apportionment (or Re-distribution)

Following chart depicts the methods of re-distribution of service department costs to production departments :

(i) Direct Re-distribution Method: Under this method, the costs of service departments are directly apportioned to production departments without taking into consideration any service from one service department to another service department. Thus, proper apportionment cannot be done on the assumption that service departments do not serve each other and as a result the production departments may either be overcharged or undercharged. The share of each service department cannot be ascertained accurately for control purposes.

(ii) Step Down Method: Under this method, the cost of most serviceable department is first apportioned to other service departments and production departments. The next service department is taken up and its cost is apportioned and this process goes on till the cost of the last service department is apportioned. Thus, the cost of last service department is apportioned only to production department.

(iii) Reciprocal Services Method : In order to avoid the limitation of Step Method, this method is adopted. This method recognizes the fact that if a given department receives service from another department, the department receiving such service should be charged. If two departments provide service to each other, each department should be charged for the cost of services rendered by the other. There are three methods available for dealing with inter-service departmental transfer:

(a) Simultaneous Equation Method,

(b) Repeated Distribution Method,

(c) Trial and Error Method.

(a) Simultaneous Equation Method: Under this method, the true cost of the service departments are ascertained first with the help of simultaneous equations ; these are then redistributed to production departments on the basis of given percentage. Following Illustration may be taken to discuss the application of this method.

(b) Repeated Distribution Method: Under this method, the totals as shown in the departmental distribution summary, are put out in a line, and then the service department totals are exhausted in turn repeatedly according to the agreed percentages until the figures become too small to matter.

(c) Trial and Error Method: Under this method, the cost of one service department is apportioned to another centre. The cost of another centre plus the share received from the first centre is again apportioned to the first cost centre and this process is repeated till the balancing figure becomes negligible.

PROBLEMS ON OVERHEADS

24. The following figures are available for the month of 25 working days 8 hours every day.

Expenses	Total	Service	Production Dept.		
	Dept.	A	B	C	
Power	1000	240	200	200	360
Salary	2000	–	–	–	–
Rent	500	–	–	–	–
Welfare	600	–	–	–	–
Others	1200	200	200	400	400
No. of workers		10	30	40	20
Floor Area	500	600	800	600	
Salary	20%	30%	30%	20%	
Service Dept., to Production Dept.		–	50	30%	20%

Calculate Labour Hour Rate for each Dept. A, B and C.

Sol : **(July-19)**

Statement showing the distribution of overheads

Expenses	Basis of Appointment	Total	Service Department	Production Department		
				A	B	C
Power	Direct	1,000	240	200	200	360
Salary	%	2,000	400	600	600	400
Rent	Floor Area (5 : 6 : 8 : 6)	500	100	120	160	120
Welfare	No.of workers (1 : 3 : 4 : 2)	600	60	180	240	120
Others	Direct	1,200	200	200	400	400
			1,000			
Distribution of Service Dept.						
Expenses to Production Dept.	(50%, 30%, 20%)		–	500	300	200
Total Expenses		5,300	–	1,800	1,900	1,600

Calculation of No. of Workers Worked

Dept. A → 25 working days × 8 Hrs per day × 30 workers = 6,000 Hrs

Dept. B → 25 workings days × 8 Hrs per day × 40 workers = 8,000 Hrs

Dept. C → 25 working days × 8 Hrs per day × 20 workers = 4,000 Hrs

Calculation of Labour hour Rate of Department

$$\text{Departments } \frac{\text{Total Expenses}}{\text{No.of Labour Hours}}$$

$$A = \frac{1,800}{6000 \text{ Hrs}} = 0.30 \text{ Per Hour}$$

$$B = \frac{1900}{8,000 \text{ Hrs}} = 0.24 \text{ Per Hour}$$

$$C = \frac{1,600}{4,000 \text{ Hrs}} = 0.40 \text{ Per Hour}$$

25. In a manufacturing concern there are court departments viz A, B, C & D. A and B are production departments and C & D are Service Departments. C renders service worth ` 12,000 to D and Balance to A & B in the ratio of 3:2. D renders service to A and B in the ratio of 9:1.

The overhead expenses incurred in a year are as follows:

Particulars	`
Depreciation	95,000
Rent, Rates and Taxes	18,000
C Insurance	7,600
Power	10,000
Canteen Expenses	5,400
Electricity	2,400

Following further information are given regarding the departments.

	A	B	C	D
Direct Material `	6,000	5,000	3,000	2,000
Direct labour `	20,000	10,000	10,000	5,000
Floor Space occupied (Sq.ft)	5,000	4,000	1,000	2,000
Value of Assets (in lakhs)	10	5	3	1
H.P. of Machines	1,000	500	400	100
No. of workers	7100	50	50	25
Light and Fan Points	50	30	20	20

From the above particulars prepare a statement showing overhead expenses of production Departments A and B after distribution of Service Department's expenses.

Sol : **(Dec.-19)**

Primary Distribution Summary

Items	Basis for Apportionment	Total	Production Department		Service Department	
			A	B	C	D
Direct Material	Given	5,000	–	–	3,000	2,000
Direct Labour	Given	15,000	–	–	10,000	5,000
Depreciation	Value of Assets	95,000	50,000	25,000	15,000	5,000
Rent, Rates and Taxes	floor space occupied	18,000	7,500	6,000	1500	3,000
Insurance	Value of Assets	7,600	4,000	2,000	1,200	400
Power	HP of Machines	10,000	5,000	2,500	2,000	500
Canteen expenses	No. of Workers	5,400	2,400	1,200	1,200	600
Electricity	Light and Fan points	2,400	1,000	600	400	400
		1,58,400	69,900	39,300	34,300	16,900

Primary Distribution Summary

Items	Total	Production Department		Service Department	
		A	B	C	D
Total	1,58,400	69,900	37,300	34,300	16,900
Service Department (13 : 2)		13,380	8,920	(–) 34, 300	12,000
Service Department D(9 : 1)		26,010	2,890		
Total		1,58,400	1,09,290	49,110	

Working Notes

1. Depreciation is calculated based on value of Assets (10 : 5 : 3 : 1).

$$A = 9,5000\frac{10}{19} = 50,000$$

$$B = 9,5000 \times \frac{5}{19} = 25,000$$

$$C = 9,5000 \times \frac{3}{19} = 15,000$$

$$D = 9,5000 \times \frac{1}{19} = 5,000$$

2. Rent, Rates and Texes on floor space occupied = 5 : 4 : 1 : 2

$$A = 18,000 \times \frac{5}{12} = 7,500$$

$$B = 18,000 \times \frac{4}{12} = 6,000$$

$$C = 18,000 \times \frac{1}{12} = 1,500$$

$$D = 18,000 \times \frac{2}{12} = 3,000$$

3. Insurance is calculated based on value of asset (10 : 5 : 3 : 1)

$$A = 7,600 \times \frac{10}{19} = 4,000$$

$$B = 7,600 \times \frac{5}{19} = 2,000$$

$$C = 7,600 \times \frac{3}{19} = 1,200$$

$$D = 7,600 \times \frac{1}{19} = 400$$

4. Power is calculated based on H:P of Machine 10 : 5 : 4 : 1

$$A = 10,000 \times \frac{10}{20} = 5,000$$

$$B = 10,000 \times \frac{5}{20} = 2,500$$

$$C = 10,000 \times \frac{4}{20} = 2,000$$

$$D = 10,000 \times \frac{1}{20} = 500$$

5. Canteen expenses is calculated based on No. of workers 4 : 2 : 2 : 1

$$A = 5,400 \times \frac{4}{9} = 2,400$$

$$B = 5,400 \times \frac{2}{9} = 1,200$$

$$C = 5,400 \times \frac{2}{9} = 1200$$

$$D = 5,400 \times \frac{1}{9} = 600$$

6. Electricity is calculated based on light and fan points (5 : 3 : 2 : 2)

$$A = 2,400 \times \frac{5}{12} = 1,000$$

$$B = 2,400 \times \frac{3}{12} = 600$$

$$C = 2,400 \times \frac{2}{12} = 400$$

$$D = 2,400 \times \frac{2}{12} = 4007$$

26. Apportion the overheads among the Department A, B, C & D

Particulars	Rs.
Works Manager Salary	4,000
Power	21,000
P. F.	9,000
Plant Maintenance	4,000
Depreciation	20,000
Canteen Expenses	12,000
Rent	6,000

Additional Information :

Particulars	A	B	C	D
No. of Employees	16	8	4	4
Area Occupied (SFT)	2,000	3000	500	500
Plant (Rs.)	75,000	1,00,000	25,000	–
Wages (Rs.)	40,000	20,000	10,000	5,000
H.P.	3	3	1	–

Sol : **(Dec.-18)**

Statement showing apportionment of overheads

Particulars	Basis of Apportionment	Overhead Total Amt	Departments			
			A	B	C	D
Works Manager salary	No. of Employees (4 : 2 : 1 : 1)	4,000	2,000	1,000	500	500
Power	H.P (3 : 3 : 1 : –)	21,000	9,000	9,000	3,000	–
P.F	Direct wages (8 : 4 : 2 : 1)	9,000	4,800	2,400	1,200	600
Plant Maintenance	Value of plant (3 : 4 :1 : –)	4,000	1,500	2,000	500	–
Depreciation	Value of plant (3 : 4 : 1: –)	20,000	7,500	10,000	2,500	–
Canteen Expenses	No. of Employees (4 : 2 : 1 : 1)	12,000	6,000	3,000	1,500	1,500
Rent	Area (4 : 6 : 1 : 1)	6,000	2,000	3,000	500	500
Total		76,000	32,800	30,400	9,700	3,100

27. Following particulars relate to a manufacturing company which has three production department A, B and C and 2 Service Department X and Y. Department Overheads as per Primary distribution.

A - Rs. 6,300, B - Rs. 7,400, C - Rs. 2,800, X - Rs. 4,500 and Y - Rs. 2,000

The company decided to charge the service department cost on the basis of following percentages.

	A	B	C	X	Y
Service Department X	40%	30%	20%	--	10%
Service Department Y	30%	30%	20%	20%	--

Find the total overheads of production department charging service department costs to production departments on Repeated distribution method.

Sol :

Repeated Distribution Method

Particulars	A	B	C	X	Y
Primary distribution	6,300	7,400	2,800	4,500	2,000
Secondary distribution					
X (4 : 3 : 2 : 1)	1800	1,350	400	-	450
					2450
Y(3 : 3 : 2 : 2)	735	735	490	490	-
X(4 : 3 : 2 : 1)	196	147	98	-	49
Y(3 : 3 : 2 : 2)	15	15	9	9	-
X(4 : 3 : 2 : 1)	4	3	2	-	-
Production overheads	9,050	9,650	4,300	-	-

28. A company has three production departments and two service departments. Distribution summary of overhead is as follows:

Production Departments :		**Service departments**	
	Rs.		**Rs.**
A	**30,000**	**X**	**2,340**
B	**20,000**	**Y**	**3,000**
C	**10,000**		

The expenses of service department are charged on a percentage basis which is as follows:

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

Find out the total overheads of production departments using simultaneous Equation method.

Sol :

Total service dept X expenses = a

a = 2340 + [20% of b]

10a = 23,400 + 2b

10a – 2b = 23,400 [Multiply by 5]

50a – 10b = 1,17,000 ... (1)

Let total service dept Y expenses = b

b = 3000 + [10% of a]

b = 30,000 + a

– a + 10 b = 30,000 ... (2)

Solving equation 1 & 2

50 a – 10 b = 1,17,000

– a + 10 b = 30,000

49 a + 0 = 1,47,000

49 a = 1,47,000

$$a = \frac{1,47,000}{49} = 3000$$

10(3000) – 2b = 23,400

30,000 – 2b = 23,400

– 2b = 23,400 – 30,000

– 2b = – 6,600

2b = 6,600

$$b = \frac{6,600}{2} = 3,300$$

Secondary Overhead Distribution Summary

Particulars	A	B	C	X	Y
Total overheads	30,000	20,000	10,000	2340	3000
Service dept x	600	1200	900	–	300
Service dept y	1320	660	660	660	
Total	31,920	21,860	11,560	(3000)	(3300)

29. A company has three production departments P1, P2, and P3 and two service departments S1 and S2 for a period the Departmental Distribution Summary of expenses is as follows: P1 Rs. 8000; P2 Rs. 7000, P3 Rs. 5,000; S1 Rs. 2340 and S2 Rs. 3000

The expenses of S1 and S2 are allocated as follows:

	P1	P2	P3	S1	S2
S_1	20%	40%	30%	–	10%
S_2	40%	20%	20%	20%	–

Apportion the service departments expenses to production departments by Simultaneous Equation Method.

Sol :

Simultaneous Equation Method

Let total overheads of department S_1 be 'X'

Let total overheads of department S_2 be 'Y'

Then

X = Rs. 2,340 + 0.2 Y

Y = Rs. 3,000 + 0.1 X

Multiply by 10 to remove decimals

(X = 2340 + 0.2 Y) 10

10X = 23,400 + 2Y

This is rearranged as follows

10X – 2Y = 23,400 ...(1)

Multiply by 10 to remove decimals

(Y = 3,000 + 0.1 X) 10

10Y = 30,000 + 1X

This is rearranged as follows

–X + 10Y = 30,000 ...(2)

Solving equation (1) and (2)

10X – 2Y = 23,400 (Multiply equation by 5)

– X + 10Y = 30,000

50X – 10Y = 1,17,000

–1X + 10Y = 30,000

49X + 0 = 1,47,000

49X = 1,47,000

$$X = \frac{1,47,000}{49} = 3,000$$

Substitute X value in equation (1)

10 (3,000) – 2Y = 23,400

30,000 – 2Y = 23,400

–2Y = 23,400 – 30,000

–2Y = –6,600

$$Y = \frac{6,600}{2} = 3,300$$

Particulars	P_1	P_2	P_3	Total
Expenses as per distribution summary	8,000	7,000	5,000	20,000
Service dept. S_1 (20% : 40% : 30%)	600	1,200	900	2,700
[90% of Rs. 3,000 = 2700]				
Service dept. S_2 (40% : 20% : 20%)	1,320	660	660	2,640
[80% of Rs. 3,300 = Rs. 2,640]				
	9,920	8,860	6,560	25,340

30. The following particulars relate to a manufacturing company which has three production departments P_1, P_2, P_3 and two service departments S_1 and S_2.

Department overhead as per primary distribution summary

Dpeartments

P_1	P_2	P_3	S_1	S_2
800	700	500	234	300

The company decided to charge the service department overheads on the basis of following percentages.

Service Departments	Production Departments			Service Departments	
	P1	P2	P3	S1	S2
S1	20%	40%	30	–	10%
S2	40%	20%	20%	20%	–

Find the total overheads of production departments charging service department costs to production departments on (a) repeated distribution and (b) by simultaneous equation method.

Sol :

(i) Repeated Distribution

Particulars	Base	P_1	P_2	P_3	S_1	S_2
Service department		800	700	500	234	300
S_1 apportioned	2:4:3:1	47	94	70	(234)	23
Service department		847	794	570	0	323
S_2 apportioned	4:2:2:2	129	65	65	64	(323)
Service department		976	859	635	64	0
S_1 apportioned	2:4:3:1	14	25	19	(64)	6
Service department		990	884	654	0	6
S_2 apportioned	4:2:2:2	2	2	2	–	(6)
Production O.H		922	886	656	–	–

(ii) Simultaneous Equation Method

Let total overheads of department S_1 = X

Let total overheads of department S_2 = Y

So X = Rs. 234 + 0.2 Y (× 10)

Y = Rs. 300 + 0.1 X

Rearranging and multiplying to remove decimals.

10X – 2Y = Rs. 2,340

– X + 10Y = Rs. 3,000

Multiplying equation (1) by 5 and add result to equation (2) we get,

49 X = Rs. 14,700

$$X = \frac{14,700}{49} = 300$$

Substitute value of X = 300 in equation (1)

10X – 2Y = 2340

10(300) – 2Y = 2340

3000 – 2Y = 2340

–2Y = 2340 – 3000

–2Y = –660

2Y = 660

$$Y = \frac{660}{2} = 330$$

Particulars	Base	Total	P_1	P_2	P_3
Service dept S_1		2000	800	700	500
(90% of Rs. 300)	2:4:3	270	60	120	90
Service dept S_2	4:2:2	264	132	66	66
(80% of Rs. 330)					
Production O.H		2534	992	886	656

31. A Company has three Production Departments and two Service Departments and for the year 2017, the departmental distribution summary has the following totals.

Production Departments:	
A ` 30,000, B ` 20,000 and C ` 10,000	**` 60,000**
Service Departments:	
X ` 5,850, Y ` 7,500	**` 13,350**
Total	**` 73,350**

The expenses of the Service Departments are charged out on a percentage basis as follows:

Particulars	A	B	C	X	Y
Service Department X	30%	40%	20%	–	10%
Service Department Y	20%	20%	40%	20%	–

Prepare a statement showing the apportionment of two Service Departments expenses to Production Departments by simultaneous Equation Method and Repeated Distribution Methods.

Sol : **(Dec.-18(KU)**

X denote the total overheads of services department 'X'

Y denote the total overheads of service department 'Y'

$X = a + by$

$Y = a + bx$

$x = 5850 + 20\% \text{ of } y$

$y = 7500 + 10\% \text{ of } x$

$x = 5850 + 0.2\ y$ ... (1)

$y = 7500 + 0.1\ x$ ... (2)

Multiply both equations by 10 we get

$10x = 58,500 + 2y$

$10y = 75000 + x$

Rearrange the equations

$10x = 58,500 + 2y$

$-X = 75,000 - 10y$

(or)

$10X - 2y = 58,500$

$-X + 10y = 75,000$

Multiply equations by 10 we will get

$$10X - 2Y = 58,500$$

$$-\quad 10X - 100Y = 7,50,000$$

$$98Y = 8,08,500$$

$$y = 8,250$$

Substitute the value of 'y'

$$X = 5850 + 0.2\ (8,250)$$

$$= 5850 + 1650 = 7,500$$

Secondary distribution summary distribution

		Departments		
Items	**Total**	**A**	**B**	**C**
Total	60,000	30,000	20,000	10,000
Dept. x (90% of 7,500)	6,750	2,250	3,000	1,500
Dept. y (80% of 8,250)	6,600	1,650	1,650	3,300
	73,350	33,900	24,650	14,800

Statement showing secondary overhead distribution

Item	Production Departments			Service Departments	
	A	**B**	**C**	**Z**	**Y**
Service Dept. X	30,000	20,000	10,000	5,850	7,500
	1755	2340	1170	– 5,850	585
	(30% of 5850)	(40% of 5850)	(20% of 5850)		(10% of 5850)
Service Dept. Y	1617	1617	3234	1617	– 8055
	(20% of 8085)	(20% of 8085)	(40% of 8085)	(20% of 8085)	
Service Dept. X	485	647	323	–1617	162
	(30% of 1617)	(40% of 1617)	(20% of 1617)		(10% of 1617)
Service Dept. Y	43	46	73	–	–
	33,900	24,650	14,800		

3.4 MACHINE HOUR RATE

Q8. What do you mean by machine hour rate ? How to calculate machine hour rate?

Ans : **(Imp.)**

Meaning

Machine hour rate is the cost of running a machine per hour. It is one of the methods of absorbing factory expenses to production. It is used in those industries or departments where machinery is predominant and there is little or practically no manual labour. In such industries or departments, overhead consists of indirect expenses in running and operating the machine. Therefore, it is desirable to calculate the machine hour rate for the entire factory but different rates may be calculated according to their make, type, size, capacity, wattage, horse power and other factors relating to each machine or group of machines as a cost centre.

Machine hour rate is obtained by dividing the total running expenses of a machine during a particular period by the number of hours the machine is estimated to work during that period.

Calculation

The information required for calculation of machine hour rate is cost of the machine; cost of installation of the machine; scrap value, if any; life of the machine in hours; standing charges like rent etc. allocated to the machine; repairs and maintenance of the machine; power consumption; set up time; cost of lubricants applied on the machine and insurance premium of the machine, if any.

The following steps are required to be taken for the calculation of machine hour rate :

1. Each machine or a group of machines should be treated as a cost centre so that all overheads relating to that machine or machines may be identified.
2. Overheads relating to a machine are divided into two parts i.e., fixed or standing charges and variable or machine expenses. Standing charges are those expenses which remain constant irrespective of the use or running of machine and examples of such expenses are rent and rates, lighting and heating, insurance, supervising labour etc. Machine expenses as power, fuel, depreciation, repairs etc. vary with the use of the machine.
3. Standing charges are estimated for a period for every machine and amount so estimated is divided by the total number of normal working hours of the machine during that period in order to calculate an hourly rate for fixed charges. For machine expenses an hourly rate is calculated for each item of expenses separately by dividing the expenses by the normal working hours. While calculating the normal working hours, the hours which are required for maintenance or for setting-up or setting-off are to be deducted.
4. Total of standing charges rate and the machine expenses rate will give the ordinary machine hour rate. If machine operator's wages are also added into the simple machine hour rate then it will be called comprehensive machine hour rate.
5. Sometime supplementary rate is used when the charge for all other overhead cost is not included in the machine hour rate i.e., only machine expenses are taken for the purpose of machine hour rate. It is also used for correcting any error in the determination of machine hour rate due to which there is heavy over-or under-absorption of overheads.

The bases which may be adopted for apportioning the different expenses for the purpose of calculation of machine hour rate are given below :

Expenses	Basis
Standing Charges	
1. Rent and rates	Floor area occupied by each machine including the surrounding space.
2. Heating and lighting	The number of points used plus cost of special lighting or heating for any individual machine, alternatively according to floor area occupied by each machine.
3. Supervision	Estimated time devoted by the supervisory staff to each machine.
4. Lubricating oil and consumable stores	On the basis of past experience.
5. Insurance	Insurable value of each machine.
6. Miscellaneous expenses	Equitable basis depending upon facts.
Machine Expenses	
1. Depreciation	Cost of machine (including cost of stand-by equipment such as spare motors, switch gears etc.) less residual value spread over its working life.
2. Power	Actual consumption as shown by meter readings or estimated consumption ascertained from past experience.
3. Repairs	Cost of repairs spread over its working life.

Q9. Explain advantages and disadvantages of Machine Hour Rate.

Ans :

Advantages

1. It helps to compare the relative efficiencies and cost of operating different machines.
2. It brings to light the existence and extent of idle time of machines.
3. It enables the management to decide how far the use of machine work is preferable to manual work.
4. It is most scientific, practical and accurate method of recovery of manufacturing overheads.
5. Cost reports prepared with the help of such rate are dependable and can help the management in decision-making.
6. It provides useful data for estimating cost of production, setting standard and for fixing selling prices for quotations.
7. It provides ready method for measuring the cost of idle machines if separate rates for fixed and variable overhead rates are calculated. When hourly rate is fixed on the basis of anticipated running

hours of the machine, there is under-absorption of fixed overhead expenses if actual running hours are less then the estimated.

Disadvantages

1. It involves additional work in assessing the working hours of machines and thus it is a costly method.
2. It does not take into account expenses that are not proportional to the working hours of machines.
3. It gives inaccurate results if manual labour is equally important.
4. It is difficult to estimate the machine hours especially when production programme is not available in advance.
5. Blanket rate cannot be used and it makes the method more costly.

PROBLEMS ON MACHINE HOUR RATE

32. Compute the Machine Hour Rate from the following data. Cost of the Machine Rs.2,00,000, Installation Charges Rs.20,000, Estimated Scrap Value after Expiry of its life of 15 years Rs. 10,000. Rent and Rates of the Shop per month Rs.400, General Lighting Rs.600 p.m. for the shop. Shop Supervisor's Salary Rs.1,200 p.m., Insurance Premium for the Machine Rs.1,920 p.a., Estimated Repairs and Maintenance Rs.2,000 p.a., Power Consumption of the Machine: 10 Units per hour, at Rs.40 per 100 Units. Estimated working hours of the Machine per year (including set up time of 200 hours): 2,200. The machine occupies 'A of the total floor area of the shop. The Supervisor of the shop devotes 1 /5th of his time for Supervising the Machine.

Sol : **(July-21)**

Calculation of Machine Hour Rate

Particulars	Per year `	Per hour `
I. Standing charges :		
Rent $\frac{400 \text{ per month}}{4} \times 12$	1,200	
General lighting $\frac{600 \text{ per month}}{4} \times 12$	1,800	
Insurance premium	1,920	
Supervisor's salary $\frac{1,200 \text{ per month}}{5} \times 12$	2,880	
Total	7,880	
Standing charge per hour $= \frac{\text{Total}}{\text{Estimated working hours} - \text{Setuptime}}$		3 = 90
$= \frac{7,800}{2200 \text{ Hrs} - 200 \text{ Hrs}}$		

II. Machine Expenses :		
Depreciation $\left(\frac{2,20,000-10,000}{15\ \text{Years}\times 2,000\ \text{Hours}}\right)$		7=00
Repairs $\frac{`\ 2,000}{2,000\ \text{Hours}}$		1=00
Power (10 units per hour @ 40 paise per hour)		15=90
Machine Hour Rate		15=90

33. Prepare a machine hour rate to cover the overhead expenses given below:

Electric power	**0.80 per hour**
Steam	**0.15 per hour**
Water	**0.025 per hour**
Repairs	**` 650 per annum**
Rent	**` 540 per annum**
Original cost of machinery	**` 25,000 per annum**
Running hours during the year	**2000 hours**
Depreciation	**15% p.a on the original cost.**

Sol : **(Dec.-18(MGU)**

Machine Hour Rate

Particulars	Amount per hour
Electric power	0.80
Steam	0.15
Water	0.025
Repairs = $\frac{650}{2000}$	0.32
Rent = $\frac{540}{2000}$	0.27
Depreciation 25,000 × $\frac{15}{100}$ × $\frac{1}{2000}$	1.87
	3.435

34. From the following you are require to calculate machine hour rate

Cost of machine	**19,200**
Estimated scrap value	**1200**
Repairs & main per month	**150**
Fixed charges (or) standing charges	**50**
Effective working life of machine 10,000 hours	
Monthly worker hours	**166**
Power per hr 5 units @ of 0.19 paise per unit.	

Sol :

Working Notes :

Calculation of dep. per hour :

Cost of machine = 19,200

Scrap value = 1200

Estimate working hours = 10,000

$$\text{Dep.} = \frac{19,200 - 1,200}{10,000} = 1.80 \text{ paise}$$

Calculation of repairs per hour

Monthly repairs = 150

Monthly worker hour = 166

$$\text{Repairs per hour} = \frac{150}{166}$$

$$= 0.903$$

Repairs per hours = 0.90 paise

Calculation of power per hour

Power per hour 5 untis 19

Rate per unit = 0.19 paise

= Power per hour = 5 × 0.19

= 0.95 paise

Machine Hour Rate

Particulars	Amt.	Amt. per hour
Standing Charges :		
Standing charges per month	50	
Standing charges per hour = $\left(\frac{50}{166}\right)$		0.30
Machine Charges :		
Depreciation		1.80
Power		0.95
Repairs		0.90
Machine hour rate		3.65

35. From the following you are require to calculated machine hour rate.

Cost of machine × = 20,000 Rs.

Estimated scrap value after 10 years of its life = 4,000

Rent, Rates of shop per quarter (3 month) = 600 Rs.

General lighting for shop = 40 Rs. (p.m.)

Shop supervisor salary = 400 (p.m.)

Insurance premium per machine × per month = 10 Rs.

Repairs & maintain per annum = 200 Rs.

Power consumption of machine = 2 units per hour @ of 0.10 paise

Estimated working hours of the machine per annum = $\frac{\mathbf{2000}}{\mathbf{12}}$ **= 167**

The machine occupies $^1/_4{}^{th}$ of total floor area. The supervisor of the shop devotes $\frac{1}{5}{}^{th}$ of with time for supervising this machine. General lighting expenses are to be apportioned on the base of area ?

Sol :

Working Notes:

(i) Calculation of Depreciation per hour

Cost of asset = 20,000

Scrap value = 4000

Estimated life = 10 years

Yearly worker hours = 2000

$$\frac{20,000-4,000}{10\times 2,000} = \frac{16,000}{20,000}$$

Dep. per hour = 0.80 paise

(ii) Calculation of Repairs per hour

Repairs per annum = 200

Yearly worker hours = 2,000

$$\text{Repairs per hour} = \frac{200}{2,000}$$

= 0.10 paise

(iii) Calculation of Power per hour

Power consumption = 2 units

Per hour = 0.10

2 × 0.10 = 0.20 paise

Machine Hour Rate

Particulars	Amt.	Amt. per hour
Standing Charges :		
Rent, Rates $\frac{600}{3}\times\frac{1}{4}$	50	
General lighting for shop 40 × $\frac{1}{4}$	10	
Supervisor salary = 400 × $\frac{1}{5}$	80	
Insurance premium	10	
	150	
Standing charges per hr = $\left(\frac{150}{167}\right)$		0.90
Machine Charges :		
Dep.		0.80
Repairs		0.10
Power		0.20
Machine hour rate		2.00

36. From the following you are require to calculate machine hour rate.

Cost of machine = 2,00,000

Establishment charges = 20,000

Estimated scrap values 15 years is 10,000.

Rent for shop per month = 400 Rs.

General lighting for shop per = 600

Insurance press for machine per annum = 1920

Repairs, main per annum = 2000 Rs.

Power consumed 10 units per hour.

Rate of power 100 units Rs. 40. estimated worker hours per annum of machine 2000 ? Shop supervisor salary per month 1200 Rs. The machine occupies $^1/_4{}^{th}$ of total area of the shop. The supervisor devotes $^1/_3{}^{rd}$ of time for this machine.

Sol :

Calculation of Depreciation per hour

Cost of machinery = 2,00,000

Establishment charges = 20,000

Total cost of machinery = 2,20,000

Scrap value = 10,000

Estimated = 15 years

Working hours = 2000 (per annum)

$$\frac{\text{Cost of machinery} - \text{Standard value}}{\text{Estimated life per hour} \times \text{Worker hour}}$$

$$\frac{2,20,000 - 10,000}{15 \times 2000} = \frac{2,10,000}{30,000} = 7 \text{ Rs.}$$

Calculation of Repairs of per hour

Repairs & maintenance per annum = 2000

Working hours per = 2000

$$\text{Repairs per hour} = \frac{2000}{2000} = 1 \text{ Rs.}$$

Calculation of Power for per hour

Power consumed 10 units per hour

Rate of power 100 units is 40 Rs.

$$\frac{40}{100} = 0.40 \text{ paise} = 10 \times 0.40 = 4 \text{ Rs.}$$

Machine hour rate

Particulars	Amount.	Amount. per hour
A) Standing Charges :		
Rent shop per month 400 × 12 × $\frac{1}{4}$	200	
General lighting for shop 600 × 12 × $\frac{1}{4}$	1800	
Insurance premium for machinery	1920	
Supervisor salary 1200 × 12 × $\frac{1}{3}$	4800	
Standing charger per hr	9720	
$\left(\frac{9720}{2000}\right)$		4.86
B) Machine charges :		
Depreciation		7
Repairs		1
Power		4
Machine hour rate		16.86

37. From the following information compute a machine hour rate of charging over heads in respect of machine no : 620.

Cost Rs. 5,500

Estimated scrap value Rs. 340

Effective working life is 10,000 hrs.

Repairs estimated at Rs. 750 over whole life of machine.

Standing charges of shop Rs. 855 for four - weekly period.

Hours worked in four - weekly period 120.

No. of machines in shop each of which bears equal charges = 30.

Power used by each machine = 6 units per hour costing 5 paise per unit.

Sol :

Computation of machine - hour rate, machine No : 620

	Particulars	Amount (in Rs.)	Amount (per hour)
	Standing charges(fixed cost) shop		0.24
	Variable charges		
a)	Depreciation		0.52
b)	Repairs and maintenance		0.08
c)	Power		0.30
	Machine hour rate →		1.14

Working Notes:

(a) Standing Charges of shop

Rs. 855 for four-weekly period for the shop

which has 30 machines.

for each machine = $\frac{855}{30} = 28.5$

working hour = 120 hrs.

for each hour = $\frac{28.50}{120} = 0.24$ Paisa

(b) Depreciation

Depreciation = $\frac{\text{Cost of the asset - scrap}}{\text{Estimated life (or) hrs}}$ = $\frac{5500-340}{10,000 \text{ hrs}} = \frac{5160}{10,000} = 0.52$

(c) Repairs and Maintenance

Given Rs. 750 for whole working life.

For hourly = $\frac{\text{Rs.}750}{10,000 \text{ hrs}} = 0.08.$

(d) Power

Given 6 units per @ 0.5 paisa per unit for 6 hrs = 6 × 0.05 = 0.30.

38. Work out in the appropriate form the machine hour rate of a saw mill with reference to the following items of information extracted from the account books of wood working shop.

Purchase price of saw mill Rs. 90,000

Railways fight, other incidental charges and installation charges = Rs. 10,000

Life of the saw mill is 10 yrs @ 2000 working hours per year

Repair charges 50% of depreciation

Consumption of electric power - 10 units per hour @ 7 paise per unit

Lubricating oil @ Rs. 2 per day of 8 hrs.

Consumable stores @ Rs. 10 per day of 8 hours.

Sol :

Computation of machine hour rate of saw mill

Particulars		Amount	Amount per hour
I	**Standing charges** (fixed cost)		
	Lubricating oil per day	2.00	
	Consumable stores per day	10.00	
	Total expenses per day of 8 hrs →	12.00	
	Expenses per hour $\left(\frac{12}{8}\text{ hrs}\right)$ (A)		1.50
II.	**Variable expenses**		
	* Depreciation	5.00	
	Repair 50% of Dep $\left(5\times\frac{50}{100}\right)$	2.50	
	power 10 units @ 7 paisa (10 × 0.07)	0.70	
	Total variable expenses → (B)		8.2
	Machine hour rate → (A + B)		9.70

Note :

$$\text{Depreciation} = \frac{\text{Cost of the asset - scrap + Installation}}{\text{Estimated life (or) hrs.}}$$

$$= \frac{90{,}000 - 0 + 10{,}000}{20.00} = \frac{100{,}000}{20{,}000} = 5$$

39. From the following details, compute hourly rate of a machine installed in a shop.

(a) Capital cost of the machine Rs. 10,000
Installation charges Rs. 1000

(b) The estimated scrap value after the expiry of its life = 3000 (10 yrs)

(c) General lighting of the shop per month Rs. 25

(d) Rent of the shop Rs, 125 per month.

(e) Shop supervisor's salary per month Rs. 240

(f) Insurance premium for the machine per year = 60

(g) Estimated repair and maintenance expenses for the Machine per year = Rs. 100.

(h) Power consumption of machine = 2 units per hour.
rate of power per 100 units = Rs. 5.

(i) Estimated working hours of the machine per year = 2000

(j) The machine occupies $\frac{1}{5}^{th}$ of the total floor area of the shop.

The supervisors in the shop is expected to devote $\frac{1}{6}^{th}$ of his time for supervising the machine. Generally lighting expenses are to be apportioned on the basis of the floor area.

Sol :

Computation of machine hour rate

Particulars	Amount (in Rs.)	Amount (per hour)
A. Standing charges per year		
Rent $\left(\frac{1}{5}^{th} \text{ floor Area}\right)$	300	
General lighting $\left(\frac{1}{5}^{th} \text{ floor Area}\right)$	60	
Supervision's salary $\left(\frac{1}{6}^{th} \text{ time}\right)$	480	
Insurance premium	60	
Total of standing charges p.a.	900	
Working hour's of the machine per year 2000.	$\left(\frac{900}{2000 \text{ hrs}}\right)$	0.45
B. Variable charges :		
Depreciation (w. note)		0.40
Repairs and maintenance	$\left(\frac{100}{2000 \text{ hrs}}\right)$	0.05
Power 2 units per hour @ 5 paisa		0.10
Machine hour rate $\rightarrow$		1.00

Working notes :

Calculation of Depreciation $= \frac{\text{Cost of the asset} - \text{scrap} + \text{Installation charges}}{\text{Estimated life (or) hrs.}}$

$= \frac{10,000 - 3000 + 1000}{20,000 \text{ hrs}} = \frac{8000}{20,000} = 0.40$

Power = for 100 units – Rs. 5

$= \left[\frac{1 \times 5}{100} = 0.05 \text{ Paisa per unit}\right]$

for 1 unit —— ?

Total 2 units per hour = 0.05 × 2

= 0.10

40. A machine is purchased for cash at ` 9,200. Its working life is estimated to be 18,000 hours after which its scrap value is estimated at ` 200. It is assumed from past experience that:

(i) The machine will work for 1,800 hours annually.

(ii) The repair charges will be ` 1,080 during the whole period of life of the machine.

(iii) The power consumption will be 5 units per hour at 6 paise per unit.

(iv) Other annual standing charges are estimated to be:

	`
(a) Rent of department (machine occupies 1/5th of total space)	**780**
(b) Light (12 points in the department - 2 points engaged in the machine)	**288**
(c) Foreman's salary (1/4th of his time is occupied in the machine)	**6,000**
(d) Insurance premium (fire) for machinery	**36**
(e) Cotton waste	**60**

Find out the machine hour rate on the basis of the above data for allocation of the works expenses to all jobs for which the machine is used.

Sol :

Calculation of Machine Hour Rate

Particulars	Per Annum `	Per Hour `
Standing Charges:		
Rent [` 780 ÷ ` 5]	156	
Light $\left[\frac{2}{12} \times ` 288\right]$	48	
Insurance Charges	36	
Cotton Waste	60	
Foreman's Salary (`6,000÷4)	1,500	
Total Standing Charges	1,800	
Hourly rate of standing charges $\left(\frac{` 1,800}{1,800}\right)$		1.00
Machine Expenses:		
Depreciation $\left(\frac{` 9,200 - ` 200}{18,000}\right) = \left(\frac{` 9,000}{18,000}\right)$		0.50
Repairs and Maintenance $\left(\frac{` 1,080}{18,000}\right)$		0.06
Power (0.06 × 5)		0.30
Machine Hour Rate		1.86

41. From the details furnished below you are required to computer a comprehensive machine-hour rate:

Original purchase rice of the machine

(Subject to depreciation at 10% per annum on original cost) ` 3,24,000

Normal working hours for the month

(The machine works to only 75% of capacity) 200 hours

Wages of Machineman `125 per day (of 8 hours)

Wages for a Helper (Machine attendant) `75 per day (of 8 hours)

Power cost for the month for the time worked ` 15,000

Supervision charges apportioned for the machine centre for the month ` 3,000

Electricity and Lighting for month ` 7,500

Repairs and Maintenance (machine) including consumable stores per month `17,500

Insurance of Plant and Building (apportioned) for the year `16,250

Other general expenses per annum `27,500

The workers are paid a fixed dearness allowance of `1,575 per month. Production bonus payable to workers in terms of an ward is equal to 33.33% of basis wages and dearness allowance. Add 10% of the basic wage and dearness allowance against leave wages and holidays with pay to arrive at a comprehensive labour-wage for debit to production.

Sol :

Calculation of Comprehensive Machine Hour Rate

(Effective hours 150) (1)

Particulars	Per Month	Per Hour
Fixed Costs		
Supervision Charges	3,000.00	
Electric and Lighting	7,500.00	
Insurance of Plant & Building $\left(`16,250 \times \frac{1}{12}\right)$	1,354.17	
Other General Expenses $\left(`27,500 \times \frac{1}{12}\right)$	2,291.67	
Depreciation $\left(`32,400 \times \frac{1}{12}\right)$	2,700.00	
	16,845.84	112.31
Variable Costs		
Repairs and Maintenance	17,500	116.67
Power	15,000	100.00
Wages of Machine Man (2)		44.91
Wages of Helper (2)		32.97
Machine hour rate		406.86

Working Notes

1. Effective machine working hours per month = 200 hours × 75% = 150 hours
2. Wages per Machine Hour

Particulars	Machineman `	Helper `
Wages for 200 hours		
(`125×25 days)	3,125	
(`75×25 days)		1,875
Dearness Allowance	1,575	1,575
	4,700	3,450
Production Bonus (1/3 of Wages + DA)	1,567	1,150
	6,267	4,600
Leave Wages (10% of Wages + DA)	470	345
	6,737	4,945
Effective wage rate per machine hour		
(150 hour in all)	44.91	32.97

Note: Working days in a month = $\frac{200 \text{ hours}}{8 \text{ hours (Daily hrs.)}} = 25$

Exercise Problems

1. A worker under the Halsey method of remuneration has a day rate of ` 12 per week of 48 hours, plus a cost of living allowance of 10 paise per hour worked. He is given 8 hours task to perform, which he completes in 6 hours. He is allowed 30% of time saved as premium bonus. What would be his total and hourly rate of earning ?

[Ans: ` 2.25p]

2. With the help of the following information, you are required to ascertain the wages paid to workers X and Y under the Taylors' system :

Standard time allowed = 10 units per hour. Normal wage rate = ` 1/hour.

Differential rate to be applied :

(a) 75% of piece rate when below standard

(b) 125% of piece rate when at or above standard.

The workers have produced in a day of 8 hours as follows : X – 60 units, Y - 100 units.

[Ans: X : ` 4.50, Y : ` 12.50]

3. Based on the following information, calculate the earnings of A, B, C and D under Merrick's multiple piece rate system, Standard production per hour 12 units, Normal rate Re. 060 per hour. In an 8-hour day, A Produces 64 units, B 96 units C 84 units and D 100 units.

[Ans: A : ` 3.20; B : ` 5.28, C : ` 4.62; D : ` 6]

4. A factory has two production departments and two service departments. The following figures have been extracted from the books of the respective departments :

	Production Depts.		Service Depts.	
	A	B	C	D
Area(sq.mtrs.)	1,500	1,100	900	500
No. of employees	40	30	20	10
Total wages	` 8,000	` 6,000	` 3,000	` 3,000
Value of Plant	` 16,000	` 12.000	` 8,000	` 4,000
Value of Stock	` 25,000	` 15,000		
Lighting units	` 5,000	` 3,000	` 1,500	` 500

The following figures of actual costs were taken from the financial books : supervision ` 3,000; Repairs to plant & machinery ` 1,200; Light ` 1,000; Employer's contribution to ESI ` 200; Rent ` 800; Depreciation of Plant ` 2,000; Insurance (stock) ` 800; Power ` 1,000; Canteen expenses ` 100. Apportion the above costs to various department on most equitable basis and draw an overhead analysis sheet.

[Ans: A: ` 4,300; B: ` 3,070; C: ` 1,830; D: ` 900]

5. A Company's production for the year ending 30.6.79 is given below:

Item	Production Dept			Office	Stores	Work shop	Total
	P1	P2	P3				
Direct wages (`)	20,000	25,000	30,000				75,000
Direct Material (`)	30,000	35,000	45,000				1,10,000
Indirect Wages (`)	2,000	3,000	3,000	1,000	2,000	2,000	13,000
Indirect Wages (`)	3,000	3,000	4,000	10,000	10,000	5,000	35,000
Area(Sq.mts.)	200	250	300	150	100	250	1,250
Book value of Machinery	30,000	35,000	25,000	-	-	15,000	1,05,000
Total H.P. of Machinery	15	20	25			5	65
Machine hours worked	10,000	20,000	15,000	-	-	-	-

General Expenses

Rent: ` 12,500; Insurance: ` 1,050; Depreciation: 15% of the value of machinery; Power: ` 3,800; Light : ` 1,250. You are required to prepare an overhead analysis sheet for the departments showing clearly the basis of apportionment where necessary.

[Ans: P ` 22,588, Q ` 29,434, R ` 30,328]

Hint : Basis of Primary Distribution : Rent-area; Insurance and depreciation book value of machines; Power-H.P. of machinery; light-area; Basis of Secondary Distribution: Workshop Overhead-Machine hours; Stores Overheads-Direct Materials; Office overheads-Direct wages.

6. A Machine costing ` 28,700, excluding installation costs of ` 300, has an anticipated life of 10 years with a residual value of ` 500. The straight line method of depreciation is followed. From the following, compute machine hour rate on the basis of anticipated working hours:

(i) Rent and rates for the factory is ` 4,000 p.a. and 5% of effective area is occupied by this machine, (ii) Insurance of the machine: ` 150 p.a.; (iii) Repairs and maintenance for the factory for the year is ` 1,000; $12^1/_2$% of this amount relates to this machine, (iv) Consumable stores etc., attributed to this machine is ` 275. (v) Total production service is ` 4,000, 10% of which is applicable to this machine, (vi) Power cost is ` 0.50 per working hour.

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

[Ans: ` 3.00]

7. Calculated the machine hour rate for the month of January, to cover the overhead expenses given below relating to a machine :

Rent of the department (1/5th area is occupied by the machine) ` 780 per annum; Lighting (out of 12 points, 2 are for this machine) ` 288 per annum; Insurance ` 36 p.a.; Cotton Waste etc ` 60 p.a.; Foreman" salary ($^{1}/_{4}^{th}$ for the machine) ` 6,000 per annum; Cost of the machine ` 9,200; Scrap ` 200

It is assumed that the machine will work for 1,800 hours per annum and that it will incur ` 1,125 for repairs and maintenance for life. It is further assumed that 5 units of power would be used per hour, available at 6 paise per unit, and that the life of the machine will be 10 years.

[Ans: ` 1.86]

Short Question and Answers

1. Direct Labour

Ans :

Direct labour is that labour which is used for the manufacture of a specific article, process, job, etc. It refers to labour engaged in altering the construction, composition, conformation or condition of the product. In other words, it is the labour which can be conveniently identified with a particular cost centre or cost unit.

Labour can be considered to be direct labour if:

(a) It can be easily attributed to a specific job, contract, process or order

(b) Its cost can be identified with total cost of production.

(c) It varies proportionately with change in output

(d) It can be controlled.

2. Indirect Labour

Ans :

Labour that does not alter the construction, conformation, composition or condition of the product, but which contributes to the completion of the product is known as indirect labour. It is the labour which serves as ancillary to the direct labour used in completing the production. The remuneration paid to indirect labour is termed as indirect wages. It is defined by the ICMA terminology as "wage cost other than direct wage cost." Examples of indirect labour are services of watchman, supervisor, inspector, foreman, cleaners, time keeping officers, storekeeper, general manager etc.

3. Replacement method

Ans :

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

Labour Turnover Rate

$$= \frac{\text{No. of workers replaced during the period}}{\text{Average No. of workers during the period}} \times 100$$

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

4. Time Rate System

Ans :

The system under which the payment is made to workers according to the time for which they work is known as time rate system. For example, if the time rate is ` 5 per hour and a labourer works for 8 hours, he will earn wages of ` 40 (8 hours * ` 5 per hour).

Total Earnings = T×R = (Time Taken×Rate)

The Time rate is fixed beforehand, and workers are remunerated for the period of time for which work is done by them. The payment can be made according to rate per hour, day, week, fortnight or month. Under this method, no account is taken of the quantity of work done. However, expected output per unit of time is normally agreed upon by management and labour.

5. Piece - Rate System

Ans :

The Payment under this system is made according to the work done, with no regard to the time taken in performing the work. The rate is fixed for each unit produced, job completed, or operation performed. For example, if the piece rate is ` 2 per unit and a labourer has produced 25 units in a day of 8 hours, he will earn wages of ` 50 (25 pieces * ` 2 per piece). This can be represented as

Total Earnings = P × R = (Number of units produced × Rate per unit)

6. Halsey Premium Plan

Ans :

Under this method, standard time for doing each job or work is fixed. The worker is given wages for the actual time taken by him to complete the work. If the worker completes the work before time, he is given a bonus for the time saved by him. The amount of bonus is usually 50% of the wages for the time saved. It may vary from 33% to 66% of wages for the time saved.

Total Earnings = T * R + % (S – T)R

where

T = Time taken

S = Standard time

R = Rate per unit of time

Note : In case of Halsey Weir Incentive scheme, this percentage must be taken as $33^1/_3$%.

7. Rowan Plan

Ans :

This method is similar to Halsey Plan. The only difference is in case of proportion of wages for time saved to be given to the worker. Under this method, the worker gets an hourly rate for the actual time taken by him to complete the work. He gets bonus if he completes the work before the standard time. The bonus payable is the proportion of wages of time taken which the time saved bears to the standard time allowed. The amount of bonus is ascertained as follows:

$$\text{Bonus} = \frac{\text{Time saved} \times \text{Time taken} \times \text{Hourly rate}}{\text{Standard time}}$$

Total Earnings = (Time taken × Hourly rate) + Bonus

8. Merrick differential piece - rate system

Ans :

This method attempts to make an improvement over Taylor's Differential piece-rate system. Under this method, three piece-rates are applied for workers with different levels of performance.

The rates of remuneration are :

Output Percentage Standard	Payment
(a) Upto 83%	Ordinary piece-rate
(b) 83% to 100%	110% of ordinary piece-rate
(c) Over 100%	120% or ordinary piece - rate

Thus, in order to decide the wages earned by a worker, we first need to calculate his output percentage standard. This is done by dividing the actual output of the worker in the standard time allotted by the standard output defined for the standard time.

9. Overheads

Ans :

CIMA defines indirect cost as "expenditure on labour, material or services which cannot be economically identified with a specific saleable cost per unit".

Wheldon defines overheads as "the cost of indirect materials, indirect labour and such other expenses, including services, an cannot conveniently be charged directly to specific cost units".

In simple words, overheads are all costs other than direct costs. All costs incurred over and above the prime cost are overheads. The terms 'burden', supplementary costs', 'on costs', 'indirect costs', 'non productive costs', 'loading' are used interchangeably for overheads.

10. Fixed Overheads

Ans :

Overheads are generally fixed for a period of time. They remain unaffected by changes in volume or production or sale. Fixed Overhead cost per unit decreases with increase in volume of activity and increases with a decline in volume of activity. They have to be incurred for a particular period irrespective of whether there is more or less production. Rent of Building and Manager's Salary are examples of Fixed expenses. Fixed expenses are not absolutely fixed at all times. If the organization increase production capacity by adding equipment or staff, Fixed expenses will go up.

11. Variable Overheads

Ans :

Overheads costs that vary in direct proportion to changes in volume of production or sales are known as Variable Expenses. They increase or decrease in amount as the volume of activity rises or falls. The cost per unit tends to remain constant. Electricity expenses and Consumables are examples of Variable Overheads Semi-Variable Overheads

Semi-Variable Overheads are partly fixed and partly variable. These expenses either (i) do not change when there is a small change in level of activity or (ii) Change in the same direction as the change in level of activity, though not in the same proportion.

12. Reciprocal Services Method

Ans :

In order to avoid the limitation of Step Method, this method is adopted. This method recognizes the fact that if a given department receives service from another department, the department receiving such service should be charged. If two departments provide service to each other, each department should be charged for the cost of services rendered by the other. There are three methods available for dealing with inter-service departmental transfer:

(a) Simultaneous Equation Method: Under this method, the true cost of the service departments are ascertained first with the help of simultaneous equations; these are then redistributed to production departments on the basis of given percentage. Following Illustration may be taken to discuss the application of this method.

(b) Repeated Distribution Method: Under this method, the totals as shown in the departmental distribution summary, are put out in a line, and then the service department totals are exhausted in turn repeatedly according to the agreed percentages until the figures become too small to matter.

(c) Trial and Error Method: Under this method, the cost of one service department is apportioned to another centre. The cost of another centre plus the share received from the first centre is again apportioned to the first cost centre and this process is repeated till the balancing figure becomes negligible.

13. Machine hour rate

Ans :

Machine hour rate is the cost of running a machine per hour. It is one of the methods of absorbing factory expenses to production. It is used in those industries or departments where machinery is predominant and there is little or practically no manual labour. In such industries or departments, overhead consists of indirect expenses in running and operating the machine. Therefore, it is desirable to calculate the machine hour rate for the entire factory but different rates may be calculated according to their make, type, size, capacity, wattage, horse power and other factors relating to each machine or group of machines as a cost centre.

Machine hour rate is obtained by dividing the total running expenses of a machine during a particular period by the number of hours the machine is estimated to work during that period.

14. Advantages of Machine Hour Rate

Ans :

(i) It helps to compare the relative efficiencies and cost of operating different machines.

(ii) It brings to light the existence and extent of idle time of machines.

(iii) It enables the management to decide how far the use of machine work is preferable to manual work.

(iv) It is most scientific, practical and accurate method of recovery of manufacturing overheads.

(v) Cost reports prepared with the help of such rate are dependable and can help the management in decision-making.

(vi) It provides useful data for estimating cost of production, setting standard and for fixing selling prices for quotations.

15. Disadvantages of Machine Hour Rate

Ans :

(i) It involves additional work in assessing the working hours of machines and thus it is a costly method.

(ii) It does not take into account expenses that are not proportional to the working hours of machines.

(iii) It gives inaccurate results if manual labour is equally important.

(iv) It is difficult to estimate the machine hours especially when production programme is not available in advance.

(v) Blanket rate cannot be used and it makes the method more costly.

16. Classfication of overheads.

Ans :

Definitions

(i) According to CIMA defines indirect cost as "expenditure on labour, material or services which cannot be economically identified with a specific saleable cost per unit".

(ii) According to Wheldon defines overheads as "the cost of indirect materials, indirect labour and such other expenses, including services, an cannot conveniently be charged directly to specific cost units".

(iii) In simple words, overheads are all costs other than direct costs. All costs incurred over and above the prime cost are overheads. The terms 'burden', supplementary costs', 'on costs', 'indirect costs', 'non productive costs', 'loading' are used interchangeably for overheads.

Cost pertaining to a cost centre or cost until may be divided into two portions direct and indirect. The indirect portion of the total cost constitutes the overhead cost which is the aggregate of indirect material cost, indirect wages and indirect expenses. CIMA defines indirect cost as "expenditure on labour, materials or services which cannot be economically identified with a specific saleable cost per unit". Indirect costs are those costs which are incurred for the benefit of a number of cost centres or cost units. Indirect cost, therefore, cannot be conveniently identified with a particular cost centre or cost unit but it can be apportioned to or absorbed by cost centres or cost units.

Fixed Overheads and Variable Overheads

Overheads may also be classified into (i) Fixed Overheads (ii) Variable Overheads and (iii) Semi-Variable Overheads.

1. Fixed Overheads

Overheads are generally fixed for a period of time. They remain unaffected by changes in volume or production or sale. Fixed Overhead cost per unit decreases with increase in volume of activity and increases with a decline in volume of activity. They have to be incurred for a particular period

irrespective of whether there is more or less production. Rent of Building and Manager's Salary are examples of Fixed expenses. Fixed expenses are not absolutely fixed at all times. If the organization increase production capacity by adding equipment or staff, Fixed expenses will go up.

2. Variable Overheads

Overheads costs that vary in direct proportion to changes in volume of production or sales are known as Variable Expenses. They increase or decrease in amount as the volume of activity rises or falls. The cost per unit tends to remain constant. Electricity expenses and Consumables are examples of Variable Overheads Semi-Variable Overheads

3. Semi-Variable Overheads

Semi-Variable Overheads are partly fixed and partly variable. These expenses either

(i) do not change when there is a small change in level of activity or

(ii) Change in the same direction as the change in level of activity, though not in the same proportion.

17. Labour Turnover

Ans :

Labour turnover is thus defined as "the rate of change in the composition of the labour force in an organization." Labour turnover varies greatly between different trades and industries. For example, where part-time and seasonal labour is employed, the rate will be higher.

Measurement of labour turnover. To facilitate comparisons between different periods and different undertakings, labour turnover may be expressed in a rate.

There are three alternative methods by which this rate is computed. Once a particular method is used, it should be consistently followed for comparative analysis. The methods are :

1. Separation method: This method takes into account only those workers who have left the organization during a particular period. Its formula is:

$$\text{Labour Turnover Rate} = \frac{\text{No. of workers left during a period}}{\text{Average No. of workers during the period}} \times 100$$

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

Multiplication by 100 in the above formula indicates rate in percentage.

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

$$\text{Labour Turnover Rate} = \frac{\text{No. of workers replaced during the period}}{\text{Average No. of workers during the period}} \times 100$$

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

3. Flux method: This shows the total change, in the composition of labour force due to separations and replacement of workers. Its formula is:

$$\text{Labour Turnover Rate} = \frac{\text{No. of workers left} + \text{No. of workers replaced}}{\text{Average No. of workers}} \times 100$$

18. Distinguish between direct and indirect labour.

Ans :

S.No.	Nature	Direct labour cost	Indirect labour cost
1.	meaning	Direct labour cost is bthat cost which isdirectly involved in the production.	Indirect labour cost is that cost whichis not directly involved in theproduction.
2.	Volume of Production	Direct labour cost depends on thevolume of production.	Indirect labour cost does not dependon volume of production.
3.	Separation	It can be separated in cost, cost center,or unit cost.	It cannot be separated.
4.	Payment	Payment of direct cost is a directexpenditure.	Payment of indirect labour is anindirect expenditure.
5.	Used	It is used to covert raw materials intofinished goods.	It is used in the production process.
6.	Part	This is a part of prime cost.	It is a part of work, office, selling anddistribution overhead.

Choose the Correct Answer

1. Labour turnover is [c]

   (a) Productivity of labour (b) Efficiency of the labour

   (c) Change in labour force (d) Total cost of the labour

2. Which of the following is / are time based incentive wage plan? [c]

   (a) Hasley Premium Plan (b) Rowan Premium Plan

   (c) both (d) None

3. It is possible for an item of overhead expenditure to be shared amongst many departments. It is also possible that this same item may relate to just one specific department. If the item was not charged specifically to a single department this would be an example of: [a]

   (a) Apportionment (b) Allocation

   (c) Re-apportionment (d) Absorption

4. An overhead absorption rate is used to : [c]

   (a) Share out common costs over benefiting cost canters

   (b) Find the total overheads for a cost centre

   (c) Charge overheads to products

   (d) Control overheads

5. Direct Labor is an element of: [d]

   (a) Prime cost (b) Conversion cost

   (c) Total production cost (d) All of the above

6. Which of the following is not included in functional classification of overheads? [d]

   (a) Repairs and maintenance (b) Lubricating oil

   (c) Consumable stores (d) Chargeable expenses

7. Which of the following is not an example of marketing overheads? [a]

   (a) Salary of the foreman (b) Publicity expenses

   (c) Salaries of sales staff (d) Secondary packing charges

8. Overhead expenses can be classified according to: [b]

(a) Functions (b) Elements

(c) Behavior (d) All of the above

9. Which of the following techniques is not meant for labour cost control? [c]

(a) Budgetary control (b) Standard costing

(c) ABC analysis (d) Ratio analysis

10. Cost of labour turnover may be treated as : [c]

(a) Direct wages (b) Prime cost

(c) Overhead (d) None of the above

Fill in the blanks

1. _____ is that labour which is used for the manufacture of a specific article, process, job etc.
2. _____ does not after the composition of the product, but contributes to the completion of the product.
3. Wage cost other than direct wage cost is _____
4. _____ record attendance time of employees.
5. _____ records the total time worked by employees on jobs.
6. Muster Roll method and Token method are the _____ methods of Time Keeping.
7. Dial Time recorder and card time recorder are the _____ Methods of Time Keeping.
8. _____ incentive scheme is based on piece rate and carrot and stick approach.
9. _____ cover all expenses that cannot be conveniently allocated to a particular job or product.
10. _____ overheads remain unaffected by the changes in the volume or production on sale.

ANSWERS

1. Direct Labour
2. Indirect Labour
3. Indirect Labour cost
4. Time Keeping
5. Time booking
6. Manual
7. Mechanical
8. Taylor's
9. Overheads
10. Fixed

UNIT IV

UNIT AND JOB COSTING

Unit Costing: Features - Cost Sheet - Tender and Estimated Cost Sheet.

Job Costing: Features - Objectives - Procedure - Preparation of Job Cost Sheet.

4.1 UNIT COSTING

4.1.1. Features

Q1. Define unit costing. Explain the features of unit costing.

Ans :

Unit costing is a method of costing by units of production and is adopted where production is uniform and a continuous affair, units of output are identical and the cost units are physical and natural. The cost per unit is determined by dividing the total cost during a given period by the number of units produced during that period. This method of costing is generally adopted where an undertaking is engaged in producing that period. This method of costing is two or more products of the same kind but of varying grades or quality.

Features

Following are the characteristics features of the industries where unit costing is used :

(i) Production consists of a single product or a few products.

(ii) Large number / quantity of identical units are produced with identical costs.

(iii) Production is more or less of standard quality.

(iv) Production is performed on continuous basis.

(v) Cost units are physical and natural e.g. number of bricks, ton of cement, meters of cloth, liters of milk.

4.2 COST SHEET

Q2. Define cost sheet? Explain its purpose.

Ans :

Meaning

Cost sheet is "a document which provides for the assembly of the detailed cost of a cost centre or cost unit". Thus cost sheet is a periodical statement of cost designed to show in detail the various elements of cost of goods produced like prime cost, factory cost of production and total cost. It is prepared at regular intervals, e.g., weekly, monthly, quarterly, yearly, etc. Comparative figures of the previous period may also be shown in the cost sheet so that assessment can be made about the progress of the business.

Purposes

Cost sheet serves the following purposes :

1. It reveals the total cost and cost per unit of goods produced.

2. It discloses the break-up of total cost into different elements of cost.

3. It provides a comparative study of the cost of current period with that of the corresponding previous period.

4. It acts as a guide to management in fixation of selling prices and quotation of tenders.

Q3. Explain the proforma of cost asset.

Ans :

Cost sheet format was under cost sheet

Particular	Amt	Amt per unit
Opening stock of raw materials	xxx	
(+) Purchase of raw material	xxx	
Carriage inwards	xxx	
	xxx	
(–) Closing stock of raw material	xxx	xxx
Material consumed		
(+) Direct wages	xxx	
Direct expenses	xxx	
Prime cost	xxx	
(+) Factory over heads :	xxx	
Factors rent	xxx	
Rents & taxes	xxx	
Dep. on factory buildings	xxx	
Dep. on factory plant & machinery	xxx	
Factory electricity	xxx	
Factory high & heating	xxx	
Insurance on factory building	xxx	
Workers manager salary	xxx	
Coal, coke and fuel and water run machine	xxx	
Factory printing & stationery	xxx	
Factory postage, telegram, telephone	xxx	
Factory worker welfare exp.	xxx	
Factory technical staff salary	xxx	
Foreman salary	xxx	
Stores operators salary	xxx	
Repairs to factory building	xxx	
Rep. P & M	xxx	
Service dep. exp.	xxx	
Indirect material	xxx	
Indirect wages	xxx	

Royalties	xxx	
Drawing house of salary	xxx	
Other factory expenses	xxx	
	xxxx	
(–) Sale of scrap value	xxx	
(+) Opening working in progress	xxx	
(–) Closing working in progress	xxx	
Factory cost (or) workers cost		xxx
(+) Office over heads :		
Office staff salaries	xxx	
Office rent, rates, taxes	xxx	
Office electricity	xxx	
Office lighting, heat and water	xxx	
Dep. on office furniture	xxx	
Dep. on office buildings	xxx	
Repairs to office furniture	xxx	
Repairs to office buildings	xxx	
Legal charges	xxx	
Audit fees	xxx	
Directors remuneration	xxx	
Subscription to chamber of comm	xxx	
Office printing & stationery	xxx	
Office postage, telegram, telephone	xxx	
Office advertisement expenses	xxx	
Cost accountant salary	xxx	
Chief accountant salary	xxx	
Bank charges	xxx	
General manager salary	xxx	
Counting office salary	xxx	
Other office expenses	xxx	
	xxx	
(+) Opening stock of finished goods	xxx	
(–) Closing stock of finished goods	xxx	
Office cost (or) cost of production		xxx

(+) **Selling and distribution overheads :**		
Selling agent salary, commission	xxx	
Selling office admin. exp.	xxx	
Advertisements	xxx	
Showroom rent, lighting etc.	xxx	
Showroom staff welfare expenses	xxx	
Packaging expenses	xxx	
Carriage outwards	xxx	
Selling office, postage, telegram, telephone etc.	xxx	
After sale service expenses	xxx	
Warehousing rent insurance	xxx	
Warehouse staff salary	xxx	
Loss in transit	xxx	
Bad debts	xxx	
Sample, free gifts	xxx	
Discounts	xxx	
Staff bonus	xxx	
Sales agents expenses	xxx	
Branch expenses	xxx	
Repairs to delivery van	xx	
Dep. on delivery van	xxx	
Other selling and distribution expenses	xxx	
		xxx
Cost of sales (or) cost of goods sold		xxx
(+) Profit		xxx
Sales		xxx

Note : While preparing cost sheet the following points are not to be considered in cost sheet:

i) Donations

ii) Interest on debentures (Borrowing tax)

iii) Deposits and loans

iv) Discount on issue of share and debenture

v) Profit on sale of fixed asset

vi) Loss on sale of fixed asset goodwill

vii) Preliminary expenses

viii) Income tax

ix) Obsolence loss

x) Wages paid on abnormal ideal time

xi) Transfer to sinking funds

xii) Penalties and damages

xiii) Bonus to directors

xiv) Staff pensions

xv) Commission to managing

xvi) Agents and partners

xvii) Provision for bad and doubtful debts

xviii) Dividends paid

xix) Proposed dividend etc. and if other financial transactions.

PROBLEMS ON UNIT (OR) OUTPUT COSTING

1. Ascertain Profit from the following:

Cost of Production Rs.88,000 for 22,000 Units, Selling Expenses Rs. 0.40 per Unit, Sales Rs.1,08,000 for 18,000 Units.

Sol : **(July-21)**

Statement of Profit

Particulars	`
Cost of production of units	
Sold (18,000 units @ 4 per unit)	72,000
Add : Selling expenses	
(18,000 units @ 0.40 per unit)	7,200
Total Cost	79,200
Profit	28,800
Sales	10,08,00

Note : Calculation of cost of production per unit

$\frac{88,000}{22,000}$ uinits = 4 per unit.

2. Find out prime cost from the following.

Opening stock of materials Rs. 10,000

Purchases Rs. 500, 000, purchase returns Rs. 5,000

Closing stock of materials Rs. 25,000 ; salaries Rs. 100,000

Wages Rs. 200,000, indirect expenses Rs. 150,000

Direct expenses Rs. 50,000

Sol :

Cost Sheet

Particulars			Amount	Amount
Opening stock of Raw material			10,000	
Add :	Purchase	5,00,000		
Less :	Purchase return	5,000	4,95,000	
			5,05,000	
Less :	Closing stock of Raw material		25,000	4,80,000
	Material consumed ⟶			4,80,000
Add :				
	wages		2,00,000	
	Direct expenses		50,000	
				2,50,000
	prime cost ⟶			7,30,000

3. From the following find prime cost.

Opening stocks of Raw material Rs. 25,000

Purchases 105,000, Carriage inwards Rs. 10,000

Closing stock of Raw material Rs. 15,000

Direct wages Rs. 10,000 ; Direct expenses Rs. 25,000

Purchase returns Rs. 5,000.

Salaries Rs. 10,000. factory expenses Rs. 5000

Sol :

Salaries and factory expenses are comes under factory over heads.

Cost sheet

	Particulars		Amount	Amount
Opening stock of Raw material			25,000	
	purchase	1,05,000		
Less :	Purchase return	5,000	1,00,000	
	Carriage inwards		10,000	
			1,35,000	
Less :	Closing stock of Raw material		15,000	1,20,000
	Material consumed			1,20,000
Add :				
	Direct wages		10,000	
	Direct Expenses		25,000	35,000
	Prime cost ⟶			1,55,000

4. For product A, the prime cost is ` 200 per unit, factory overheads are 20% of prime cost. Administrative overheads are 25% of works cost. Profit is 25% on selling price. Calculate Selling Price.

Sol : **(Dec.-18)**

Calculation of Selling Price

Particulars	Amount
Prime cost	200
(+) Factory overheads $(200 \times \frac{20}{100})$	40
Works cost	240
(+) Administrative overheads $(240 \times \frac{25}{100})$	60
Total Cost	300
(+) Profit (25% on selling price)	100
Selling price	400

5.. From the following data find works cost/ factory cost. Opening stock of Raw material Rs. 30,000; carriage inwards Rs. 10,000 closing stock of Raw material Rs 18,000; purchases Rs. 128,000 Indirect material Rs. 10,000; power Rs.2,000; consumable stores Rs. 5,000, factory heating expenses R. 6,000 Depreciation an plant & machinery Rs. 8,000 Indirect wages Rs. 5,000; Direct wages Rs. 10,000; Factory manager salary Rs. 10,000; direct expenses Rs. 10,000

Sol :

Cost sheet for the year ended.....

Particular		Amount	Amount
Opening stock raw material		30,000	
	purchase	1,28,000	
	Carriage inwards	10,000	
		1,68,000	
Less :	Closing stock of raw material	18,000	
	Material Consumed ⟶		1,50,000
ADD :			
	Direct expenses	10,000	
	Direct wages	10,000	20,000
	Prime cost ⟶		1,70,000
ADD :	Factory over head		
	Indirect material	10,000	
	Power	2,000	
	Consumable stores	5,000	
	Factory heating expenses	6,000	
	Depreciations on plant & machinery	8,000	
	Indirect wages	5,000	
	Factory manager salary	10,000	
			46,000
	Works Cost (or) Factory cost ⟶		2,16,000

6. Compute works cost from the following :

Direct material Rs. 10,000; direct wages Rs. 30,000

Direct Expenses Rs. 10,000

Indirect wages 50% of direct wages; Indirect materials 50% of direct material, indirect expenses 100% of direct Expenses.

Sol :

Cost sheet

	Particular	Amount	Amount
	Direct material / material consumed		10,000
	Direct wages		30,000
	Direct Expenses		10,000
	Prime cost ⟶		50,000
Add :	Factory over heads		
	Indirect wages		
	$\left[30,000 \times \frac{50}{100}\right]$	15,000	
	Indirect material		
	$\left[10,000 \times \frac{50}{100}\right]$	5,000	
	Indirect expenses		
	$\left[10,000 \times \frac{100}{100}\right]$	10,000	30,000
	works cost ⟶		80,000

7. From the following particulars you are require to prepare cost sheet

Opening stock of raw material	**10,000**
Opening work in progress	**14,000**
Opening finished goods	**15,000**
Direct labour	**98,000**
Purchase of material	**1,60,000**
Indirect labour	**40,000**
Heat, lighting and power	**20,000**
Factory insurance & taxes	**5,000**
Repairs to plant	**3,000**
Factory expenses	**5,000**
Dep. on factory build	**6,000**
Dep. on factory plant	**10,000**
Office salaries	**10,000**
Legal charges	**2,000**
Office electricity	**4,500**
Office postage, stationery	**2,200**

Closing stock of raw material	**10,000**
Closing work in procedure	**8,000**
Closing finished goods	**30,000**
Selling & distribution expenses	**14,000**
Repairs to delivery van	**5,000**
Bad debts	**1,500**
Sales	**9,40,000**

Sol :

Cost Sheet

Particulars	Amount	Amount
Opening stock of raw material	10,000	
(+) Purchase of material	1,60,000	
	1,70,000	
(–) Closing stock of raw material	10,000	
Material consumed		1,60,000
(+) Direct labour		98,000
Prime cost		2,58,000
(+) **Factory overhead expenses**		
Factory insurance & taxes	5,000	
Repairs to plant	3,000	
Heat, lighting	20,000	
Indirect labour	40,000	
Factory expenses	5,000	
Dep. on factory building	6,000	
Dep. on factory plant	10,000	
	89,000	
(+) Opening work in - progress	14,000	
	1,03,000	
(–) Closing work in procedure	8,000	95,000
Factory cost		3,53,000
(+) Office overhead expenses :		
Office salary	10,000	
Legal charges	2,000	
Office electricity	4,500	
Office postage, stationary	2,200	
	18,700	
(+) Opening stock of finished goods	15,000	
	33,700	
(–) Closing stock of finished goods	30,000	3,700
Cost of production		3,56,700

(+) Selling & Distribution :		
Selling & distribution expenses	14,000	
Repairs to van	5,000	
Bad debts	1,500	20,500
Cost of goods sold		3,77,200
Profit		5,62,800
Sales		9,40,000

8. From the following you are require prepare cost sheet

Opening stock of raw materials	**22,000**
Closing stock of raw materials	**24,464**
Opening stock of finished	**17,600**
Closing stock of finished	**35,200**
Opening work in progress	**14,450**
Closing work in progress	**7,500**
Material purchase	**1,32,000**
Closing inwards	**5,000**
D. Wages	**1,10,000**
Factory rent	**44,000**
Lighting, heating of factory	**5,000**
Office electricity	**2,450**
Office staff salary	**10,000**
Dep. on plant & machinery	**3,300**
Dep. on office furniture	**5,400**
Repairs to delivery van	**2,000**
Advertisement	**10,000**
Warehouse rent	**7,500**
Cost a/c salary	**4,800**
Chief a/c salary	**2,200**
Legal charges	**4,000**
Donations	**4,500**
Transfer fee	**2,200**
Sales	**6,00,000**

Sol :

Cost Sheet

Particulars	Amount	Amount
Opening stock	22,000	
(+) Purchases	1,32,000	
Carriage inwards	5,000	
	1,59,000	
(–) Closing stock of material	24,464	
Material consumed		1,34,536
(+) Direct expenses		1,10,000
Prime Cost		2,44,536
(+) Factory overhead expenses		
Factory rent	44,000	
Lighting, heating	5,000	
Depreciation on plant	3,300	
	52,300	
(+) Opening work in progress	14,450	
	66,750	
(–) Closing work in progress	7,500	59,250
Factory cost		3,03,786
(+) Office overhead expenses		
Office electricity	2,450	
Office staff	10,000	
Depreciation on office	5,400	
Cost a/c salary	4,800	
Chief a/c salary	2,200	
Legal charges	4,000	
	28,850	
(+) Opening finished goods	17,600	
	46,450	
(–) Closing finished goods	35,200	11,250
Cost of production		3,15,036
(+) Selling expenses		
Repairs to deliver van	2,000	
Advertisement	10,000	
Ware house rent	7,500	19,500
Cost of goods sold		3,34,536
Profit		2,65,564
Sales		6,00,000

9. From the following you are cost sheet 31/12/2017

Opening stock of raw material	62,800
Closing stock of raw materials	48,000
Materials purchased	1,85,000
Travelling expenses	2,100
Drawing of his salary	6,500
Counting house salary	12,600
Advertisement expenses	2,900
Carriage outwad	4,300
Carriage inward	7,150
Bad debts written off	6,500
Repairs of plant & machinery	4,450
Factory rent, rates, taxes	8,500
Office rent, rates, taxes	2,000
Sales travellers and salaries commission	7,700
Direct wages	1,26,000
Dep. on office furniture	300
Directors fee	6,000
Factory gas & water	1,200
Office gas & water	400
Manager salary [$^3/_4{}^{th}$ factory $^1/_4{}^{th}$ office]	
General expenses	3,400
Dep. on plant & machinery	6,500
Sales	4,61,100

Sol :

Cost Sheet as on 31/12/2017

Particulars	Amount	Amountt
Opening stock of raw material	62,800	
(+) Purchases	1,85,000	
Carriage inwards	7,150	
	2,54,950	
(–) Closing stock of raw material	48,000	
Material Consumed		2,06,950
(+) Direct wages		1,26,000
Prime cost		3,32,950
(+) Factory overhead expenses :		
Drawing of his salary	6,500	
Repairs to plant & machinery	4,450	
Factory rent, rates, taxes	8,500	
Factory gas & water	1,200	
3/4th factory machinery salary	7,500	
Dep. on plant & machinery	6,500	34,650
Factory cost (or) works cost		3,67,600
(+) Office overhead expenses		
Travelling expenses	2,100	
Counting house salary	12,600	
Office rent	2,000	
Dep. on office for	300	
Directors fee	6,000	
Office gas & water	400	
manager salary 1/4th	2,500	
General expenses	3,400	29,300
Cost of production		3,96,900
(+) Selling & overhead		
Advertisement expenses	2,900	
Carriage outwards	4,300	
Bad debts	6,500	
Sales travellers & commission expenses	7,700	21,400
Cost of goods sold		4,18,300
Profit		42,800
Sales		4,61,100

10. From the following data find cost of production.

Opening stock of Raw material Rs. 15,000 Indirect material Rs. 10,000; office staff salary Rs,. 10,000 purchases Rs. 105,000; purchase returns 5000, oil, steam Rs. 5000 office printing charges Rs. 8000; carriage in wards Rs. 5000, Closing stock of Raw material Rs. 10,000, Direct wages Rs. 12000, Direct expenses Rs. 8000; power Rs. 5000; stationary Rs. 4000, telephone, telegrams Rs, 6000; factory heating expenses Rs. 5000, factory lighting expenses Rs. 4000; factory Rent Rs. 3000; consumable stores Rs. 3000; office rent & taxes Rs. 5000. Director fees 8000; Depreciation of office asset Rs. 2000 depreciation on plant & machinery Rs. 2000; Indirect wages Rs. 4000 postage Rs. 1000; sundry expenses Rs. 3500; office expenses 500.

Opening stock of work-in-progress Rs. 10,000

Closing stock of work-in-progress Rs. 5000

Sol :

Cost Sheet

	Particulars		Amount	Amount
	Opening stock of Raw Material	1,05,000	15,000	
Add :	purchases			
Less :	purchase Returns	5,000	100,000	
	Carriage inwards		5,000	
			120,000	
Less :	Closing stock		10,000	
	Material consumed →			1,10,000
Add :	Direct wages		12,000	
	Direct expenses		8,000	20,000
	Prime cost →			1,30,000
Add :	Factory over head			
	Oil, steam		5,000	
	power		5,000	
	Factory heating expenses		5,000	
	Factory lighting expenses		4,000	
	Factory Rent		3,000	
	Consumable stores		3,000	
	Depreciation on plant &			
	Machinery		2,000	
	Indirect wages		4,000	
	Indirect material		10,000	41,000
				171,000

Add : Opening stock of work -in-progress		10,000
		181,000
Less : Closing stock of work-in-progress		5,000
Works cost ⟶		176,000
Add : Administration overhead		
(or)		
Office overhead		
Office staff salary	10,000	
Office printing charges	8,000	
Stationery	4,000	
Telephone & Telegram	6,000	
Office Rent & taxes	5,000	
Director fees	8,000	
Depreciation on office asset	2,000	
Postage	1000	
Sundry expenses	3500	
Office expenses	500	48,000
Cost of production ⟶		2,24,000

11. The Bangalore Ltd. supplies you the following information and requires you to prepare a cost sheet.

Particulars	`
Stock of raw materials on 1st Sept., 2017	**75,000**
Stock of raw materials on 30th Sept., 2017	**91,500**
Direct wages	**52,500**
Indirect wages	**2,750**
Sales	**2,00,000**
Work-in-progress on 1st Sept., 2017	**28,000**
Work-in-progress on 30th Sept., 2017	**35,000**
Purchases of raw materials	**66,000**
Factory rent, rates and power	**15,000**
Depreciation of plant and machinery	**3,500**
Expenses on purchases	**1,500**
Carriage outward	**2,500**
Advertising	**3,500**
Office rent and taxes	**2,500**
Travellers' wages and commission	**6,500**
Stock of finished goods on 1st Sept., 2017	**54,000**
Stock of finished goods on 30th Sept., 2017	**31,000**

Sol :

Cost Sheet for the Month ending 30th Sept., 2017

Particulars		Amount	Amount
	Opening Stock of raw material (1st Sept.)	75,000	
Add:	Purchases	66,000	
	Expenses on purchases	1,500	
		1,42,500	
Less:	Closing Stock of raw material (30th Sept.)	91,500	
	Materials consumed		51,000
	(+) Direct wages		52,500
	Prime Cost		1,03,500
Add:	Opening Work-in-progress (1st Sept.)		28,000
	Factory Overheads :		
	Indirect wages	2,750	
	Factory rent, rates and power	15,000	
	Depreciation of plant and machinery	3,500	21,250
			1,52,750
Less:	Closing Work-in-progress (30th Sept.)		35,000
	Works Cost		1,17,750
	Office and Administration Overheads :		
	Office rent and taxes		2,500
	Cost of Production		1,20,250
Add:	Opening Stock of finished goods (1st Sept.)		54,000
			1,74,250
Less:	Closing Stock of finished goods (30th Sept.)		31,000
	Cost of Goods Sold		1,43,250
	Selling and Distribution Overheads :		
	Carriage outward	2,500	
	Advertising	3,500	
	Travellers' wages and commission	6,500	12,500
	Cost of Sales		1,55,750
	Profit		44,250
	Sales		2,00,000

12. In a factory two types of articles are produced viz., A and B. From the following particulars prepare a Statement of Cost showing Total Cost of each variety and ascertain the Total profit.

	A	B
Materials	**60,000**	**1,00,000**
Wages	**1,20,000**	**1,40,000**

Works on Cost is charged at 40% of Works Cost and Office on Cost is taken at 20% on Total Cost. Article 'A' sold during the period are 180 at Rs. 2,400 each and Article of B' sold are 200 at Rs. 3,000 each.

Sol : **(July-21)**

Statement of Cost and Profit

Particulars	**A**	**B**
Materials	60,000	1,00,000
Wages	1,20,000	1,40,000
I. Prime Cost	1,80,000	2,40,000
Add: Works on cost (40% on words cost)	1,20,000	1,60,000
II. Works Cost	3,00,000	4,00,000
Add: Office on cost (20% on total cost)	75,000	1,00,000
III. Total Cost	3,75,000	5,00,000
Add: Profit	57,000	1,00,000
Sales	4,32,000	6,00,000
Article A 180 Articles @ 2,400 each		
Article B 200 Articles @ 3.000 each		

Working Notes :

Calculation of works on cash for Articles A and B on work cost

Assume works cost as	100
(–) works on cost 40%	40
Prime cost	60

Article A $\rightarrow$ 1,80,000 $\times \frac{40}{60}$ = ` 1,20,000

Article B $\rightarrow$ 2,40,000 $\times \frac{40}{60}$ = ` 1,60,000

Calculation of office on cost for articles A and B on total cost

Assume total cost as	100
(–) office on cost 20%	20
works cost	80

Article A $\rightarrow$ 3,00,000 × $\frac{20}{80}$ = ` 75,000

Article B $\rightarrow$ 2,40,000 × $\frac{20}{80}$ = ` 1,00,000

13. From the following particulars, prepare a cost sheet showing

(i) Cost of materials used

(ii) Prime cost

(iii) Works cost

(iv) Cost of Production

(v) Percentage of works overhead to productive wages and

(vi) Percentage of general overhead to works cost.

Stock materials, 1st January 2013 ` 20,000

Stock of finished goods on 1st January 2013 ` 51,000

Raw materials purchased ` 5,80,000.

Productive wages ` 2,90,000 Sales ` 12,12,000

Stock of materials unused, 31st December 2013 ` 25,000

Works overhead ` 86,000

Office and general expenses ` 72,000

Stock of finished goods 31st December 2013 ` 48,000

Sol : **(Dec.-18(MGU)**

Cost sheet

Particulars	Amount	Amount
Opening stock of Raw materials	20,000	
(+) Purchased	5,80,000	
	6,00,000	
(–) Closing stock	25,000	5,75,000
Cost of Raw materials		5,75,000
(+) Wages		2,90,000
Prime cost		8,65,000
(+) Works overhead		86,000
Factory cost		9,51,000
(+) Office and general expenses		72,000
Cost of production		10,23,000
Opening finished goods	51,000	
(–) Closing finished goods	48,000	3,000
Total cost		10,26,000
Profit (B/F)		1,86,000
Sales		12,12,000

4.3 TENDER AND ESTIMATED COST SHEET

Q4. Explain briefly about purpose of preparing estimated cost sheet for tenders?

Ans :

Meaning

Cost accounts help a great deal in preparation of estimates for the tender. Generally, expenses incurred in the pervious year are made on the basis for submission of tenders or quotations.

Direct materials required, direct wages and direct expenses are identifiable with the product. Thus, they can be easily ascertained.

Number of units as basis

If information is provided on member of units produced and sold in the previous year and the number of units for which quotation or estimate is required to be made, then all the over-heads must be absorbed at the cost per unit for each of such over-heads in the previous period. Any increase or decrease in any of the expenses needs to be added or deducted after the total cost for the particular item of expense is arrived at on the basis of number of units being produced.

For Example

Let, factory over-heads in case of a company in the previous production period amounted to Rs. 10,000 for producing 10,000 units. The company plans to produce 15000 units in the current period. It is estimated that factory over-heads will increase by 20% in the current period over the previous period. In such a case, first ascertain the cost of factory over-head per unit in the previous period. The per unit cost of factory over-heads works out to Rs.. 10. Thus, the total cost of producing 15000 units in the current period would be 15000 units x Rs. 10 per unit = Rs. 150000. However, there is a 20% increase in factory overheads in the current period. Thus, the estimate for factory overhead will be Rs. 150000 + 20% x Rs. 150000 = Rs. 180000.

Percentage of some other expenses :

If the information is not provided for number of units, factory over heads are estimated and charged on the basis of its percentage to direct wages in the previous year, similarly, Administration, selling and distribution over heads are charged on the basis of percentage to works cost in the previous year.

1. Calculate of works over head percentage on the basis of Direct Wages.

$$\frac{\text{works over head in the previous year}}{\text{Direct wages Amount in the previous year}} \times 100$$

2. Calculation of Administration over head percentage on the basis of works costs.

$$\frac{\text{Normal cost of normal output}}{\text{Normal output}} \times \text{units of abnormal loss}$$

3. Calculation of selling & distribution over head on the basis of works cost.

$$\frac{\text{Selling and Distribution over head}}{\text{works cost}} \times 100$$

PROBLEMS ON TENDER (OR) QUOTATION

14. Find the Price to be quoted for the following :

Direct Material Rs. 1500, Labour 1200, Direct Expenses Rs. 100

Work overheads 50% of Prime Cost, Office overheads 10% of works cost

Profit on Selling Price 25%.

Sol : **(Dec.-18)**

Calculation of Price to be Quoted

Particulars	`	`
Direct Material		1,500
Direct Labour		1,200
Direct Expenses		100
Prime cost		2,800
Add : Work overheads		
(50% of Prime cost)		1,400
Works cost		4,200
Add : Office overheads		420
(10% of works cost)		
Cost of Production / Total cost		4,620
Add : Profit		1,207
Sales		5,827

Working Notes:

Calculation of Profit

Assume selling price as 100

(–) 25% Profit 25

Total cost 75

Total cost if is 75 – Profit is 25

Total cost is 4,620 – ?

$$4{,}620 \times \frac{25}{75} = ` 1{,}206$$

15. The accounts of a manufacturing company showed the following details for the year 1999.

Material used Rs. 600,000, productive wages Rs. 500,000; works over head Expenditure Rs. 100,000; establishment and General Expenses Rs. 60,000 prepare a statement showing.

i) The works cost

ii) The total cost

iii) The percentage of works over head expenditure to productive wages and

iv) The percentage of establishment and General Expenses to works cost.

What price should the company quote, on the basis of the above information to manufacture a machine which would require materials valued at Rs. 6000 and wages Rs. 3,000 so that the price will yield a profit of 25% on the selling price ?

Sol :

Cost sheet for the year ended 1999. of a manufacturer

Particulars	Amount	Amount
Material consumed		6,00,000
Add : Productive wages		5,00,000
Prime cost ⟶		11,00,000
Add : Factory over head		
works over head Exp		1,00,000
Works cost ⟶		12,00,000
Add : Administrative over head		
established and general exp		60,000
Total cost ⟶		12,60,000

Working Notes:

i) Calculation of factory overhead percentage on the basis of productive wages (or) direct wages.

for 5,00,000 — Rs. 1,00,000

(wages) (Factory overheads)

for 100% — ?

$$\frac{100 \times 100,000}{500,000} = 20\%.$$

ii) Calculation of Administrative overhead percentage on the basis of works cost.

for Rs. 1200,000 — Rs.60,000

for 100% — ?

$$\frac{100 \times 60,000}{1200,000} = 5\%$$

Calculation of Tender quotation price for the year 2000.

	Particulars	Amount	Amount
	Consumed material		6,000
Add :	Direct wages		3,000
	Prime cost ⟶		9,000
Add :	Factory over head		
	20 % on wages $\left(3000 \times \frac{20}{100}\right)$		600
	Works cost ⟶		9,600
Add :	Administrative over head		
	5% on works cost $\left(9600 \times \frac{5}{100}\right)$		480
	Total cost		10,080
Add :	Profit on selling price		
	$\left(10,080 \times \frac{25}{75}\right)$		3,360
	Selling price ⟶		13,440

16. The following information is extracted from the manufacturing account of a factory for the year ending 31st Dec 2006. Material consumed Rs. 600,000; Direct wages Rs. 400,000 factor expenses Rs. 240,000 ; office and administrative expenses Rs. 155,000.

During the year 2007, the factory received a request from customer for quotation for the manufacturer and supply of a machine for which the estimated cost of material was Rs. 40,000 and Rs. 30,000 in wages. What should be the quotation if the factory desires to make a profit of 25% on the selling price.

Sol :

Calculation of cost sheet for the year ended 31-Dec-2006

	Particulars	Amount	Amount
	Material consumed		6,00,000
Add :	Direct wages		4,00,000
	Prime cost ⟶		10,00,000
Add :	Factory over head		
	Factory expenses		2,40,000
	Works cost ⟶		12,40,000
Add :	Office and Administrative over head		
	Office exp		1,55,000
	Total cost ⟶		13,95,000

Working Notes:

i) Calculation of factory over head percentage on the basis of Direct wages.

for Rs. 4,00,000 — Rs. 2,40,000

for 100% — ?

$$\frac{100 \times 240,000}{400,000} = 60\%$$

ii) Calculation of office and Administrative over head percentage on the basis of works cost.

for 12,40,000 — 1,55,000

for 100% — ?

= 12.5%

Calculation of tender Quotation for the year 2007

	Particulars	Amount	Amount
	Material consumed		40,000
Add :	Wages		30,000
	Prime cost ⟶		70,000
Add :	**Factory over head**		
	$\left(30,000 \times \frac{60}{100}\right)$		18,000
	Works cost ⟶		88,000
Add:	**Administrative overheads**		
	on working cost $\left(88000 \times \frac{12.5}{100}\right)$		11,000
	Total costs ⟶		99,000
Add :	profit $\left(\frac{99000 \times 25}{75}\right)$		33,000
	Selling price ⟶		132,000

17. From the under stated particulars, you are required to prepare a monthly cost sheet of plastic Toy manufactures ltd., showing cost and profit per 1000 Toys. Show also in the form of summary, the cost of sales, Net profit and sales for the month. The company manufactures only one type of toys. The opening stock was valued at the same price per 1,000 Toys as the production for the month concerned.

Materials :

Basic Raw materials 1300 tonnes @ 5 per tonne.

Stores Rs 5000

Labour : Direct Rs 16,000

indirect Rs, 3,000

on cost : works 25% of direct labour

office 10% of works cost

production for the month (June 1986) 10,00,000 toys sales for the month 900,000 toys at Rs.50 per 1000.

stock 1st June, 1986 - 200,000

stock 30th June, 1986 - 300,000

Sol :

Cost sheet of plastic Toy Manufacturers ltd. (out put 10,00,000)

Particulars	Cost per 1,000 Toys	Total Cost
Basic material 400 tonnes @ 5 per ton	7.00	7,000
Direct labour	16.00	16,000
Prime cost ⟶	23.00	23,000
Add : Factory over heads		
Stores	5.00	5,000
Indirect labour	3.00	3,000
works on cost 25% on wages	4.00	4,000
Works cost	35.00	35,000
Add : Administrative over head		
10% on works cost	3.50	3,500
		38,500
Total cost ⟶	38.50	7,700
Add : opening stock of finished toys (200,000 toys)	–	46,200
Less : closing stock of finished toys (300,000 toys)	–	11,550
Total cost ⟶	38.50	34,650
Add : profit	11.50	10,350
Sales (900,000) toys ⟶	50.00	45,000

18. Lishanth Co. Ltd. manufactured and sold 1,000 refrigerator during the year ending 31st March, 2013. The Trading and Profit & Loss Account was as follows.

Dr. Trading and Profit & Loss Account for the year ended 31st March 2013 Cr.

Parriculars	Rs.	Parriculars	Rs.
To Cost of Materials	80,000	By Sales	4,00,000
To Direct Wages	1,20,000		
To Manufacturing Expenses	50,000		
To Gross Profit c/d	1,50,000		
	4,00,000		4,00,000
To Management & staff salaries	60,000	By Gross Profit b/d	1,50,000
To Rent, Rates & Insurance	10,000		
To General expenses	20,000		
To Selling expenses	30,000		
To Net profit	30,000		
	1,50,000		1,50,000

For the year ending 31st March, 2014, it is estimated that:

(i) Output and sales will be 1,200 refrigerators

(ii) Prices of raw materials will rise by 20% on the previous year's level.

(iii) Wages will rise by 5%

(iv) Factory overheads will rise in proportion to the combined cost of materials and wages.

(v) Selling expenses will remain unchanged per unit.

(vi) Other expenses will be unaffected by the rise output.

Prepare Quotation for the 1,200 refrigerator calculating 10% profit on selling price.

Sol :

Calculation of profit for 1000 Refrigerators

Particulars	Per Unit	Amount
Cost of materials $\left[\frac{80,000}{1000}\right]$	80.00	80,000
Wages $\left[\frac{1,20,000}{1000}\right]$	120.00	1,20,000
Prime cost	200.00	2,00,000
Manufacturing expenses	50.00	50,000
Factory cost	250.00	2,50,000

Administrative overheads		
Salaries	60.00	60,000
Rent	10.00	10,000
General expenses	20.00	20,000
Selling expenses	30.00	30,000
Total cost	370.00	3,70,000
Profit [Balance fig]	30.00	30,000
Sales	400.00	4,00,000

Calculation of profit for 1200 refrigerators

Particulars	per unit	per unit	Amount
Materials	80.00		
(+) Increase by 20% (80 × 20%)	16.00	96.00	1,15,200
Wages	120.00		
(+) Increase by 5% (120 × 5%)	6.00	126.00	1,51,200
Prime cost		222.00	2,66,400
(+) Factory overheads 25% of prime cost		55.50	66,600
Factory cost		277.50	3,33,000
Salaries (Fixed)		50.00	60,000
Rent (Fixed)		8.33	10,000
General expenses (Fixed)		16.67	20,000
Selling expenses (per unit same)		30.00	36,000
Total cost		382.50	4,59,000
Profit [382.50 × 10/90]		42.50	51,000
Total sales		425.00	5,10,000

19. The accounts of a manufacturing Company showed the following details :

Material used Rs. 6,00,000 ; Wages Rs. 5,00,000, Works expenses

Rs. 1,00,000; General Expenses Rs. 60,000

What price the company should quote, on the basis of above information to manufacture a machine which would require Material Rs. 6000 and Labour

Rs. 3000. So, that the price will yield a profit of 25% on selling price.

Sol : **(Dec.-18)**

Cost Sheet of a manufacturing Co.,

Particulars	`	`
Direct Materials		6,00,000
Direct wages		5,00,000
I Prime Cost		11,00,000
Add : Works overheads		
Works Expenses		1,00,000
II Works Cost		12,00,000
Add : Administrative overheads		
General Expenses		60,000
III Cost of production		12,60,000
Add : Selling & distribution overheads		–
IV Total Cost		12,60,000

Quotation for 1 Machine

Particulars	`	`
Direct Materials		6,000
Direct Labour /wages		3,000
I Prime Cost		9,000
Add : Works overheads		
(20% on wages i.e., 3000)		600
II. Works Cost		9,600
Add : Administrative overheads		
(5% on works cost i.e., 9600)		480
III. Cost of Production		10,080
Add : Selling & Distribution overheads		–
IV Total Cost		10,080
Add : Profit		3,360
Sales		13,440

Working Notes :

1. Calculation of % of works overheads on the basis of direct wages

$$\frac{\text{Works overheads}}{\text{Direct wages}} \times 100$$

$$\frac{1,00,000}{5,00,000} \times 100 = 20\%$$

2. Calculation of % of Administrative overheads on the basis of works cost

$$\frac{\text{Administrative overheads}}{\text{Works cost}} \times 100$$

$$\frac{60,000}{12,00,000} \times 100 = 5\%$$

3. Calculation of Sales Price to be Quoted

Assume sales as 100, In that 25% profit is included

100 – 25 = 75 is Total Cost

Total Cost if is 75 – Sales 100

Total Cost is 10,080 ?

$$\frac{100}{75} \times 10,080 = ` 3,360$$

---

20. Following information is from manufacturing account of a Factory, for the year ending 31-12-1980.

Material Consumed	**Rs. 6,00,000**
Wages	**Rs. 4,00,000**
Factory Expenses	**Rs. 2,40,000**
Office Expenses	**Rs.1,55,000**

During 1981, the factory received a request from customer for quotation, which estimated Material Rs. 40,000 and Wages Rs. 30,000. What should be the quotation if the factory desires to make a profit 25% on Selling Price?

Sol : **(July -19)**

Cost sheet of a Factory for the year ended 31/12/80

Particulars	Amount	Amount
Materials Consumed		6,00,000
Wages		4,00,000
I. Prime Cost		10,00,000
Add : Factory overheads / Factory expenses		2,40,000
II. Factory Cost		12,40,000
Add : Office overheads / Ofiice expenses		1,55,000
III. Cost of production		13,95,000
Add : Selling & Distribution overheads		–
IV. Total Cost		13,95,000

Quotation for the year 1981

Particulars	Amount	Amount
Material		40,000
Wages		30,000
I. Prime Cost		70,000
Add : Factory overheads (60% on wages)		18,000
II. Factory Cost		88,000
Add : Office overheads (12.5% on factory cost)		11,000
III. C.O.P		99,000
Add : Selling & Distribution overheads		–
IV. Total Cost		99,000
Add : Profit		33,000
Sales		1,32,000

Working Notes :

1. Calculation % of factory overheads on Direct Wages

$$\frac{\text{Factory overheads}}{\text{Direct wages}} \times 100$$

$$\frac{2,40,000}{4,00,000} \times 100 = 60\%$$

2. Calculation of % of office overheads on Factory Cost

$$\frac{\text{Office overheads}}{\text{Factory cost}} \times 100$$

$$\frac{1,55,0\cancel{00}}{12,\cancel{40,000}} \times 1\cancel{00} = 12.5\%$$

3. Calculation of Profit

Assume selling price as	100
(–) 25% Profit	25
Total	75

Total Cost if is 75 – Profit 25

Total Cost if is 99,000 – ?

$$99,000 \times \frac{25}{75} = ` 33,000$$

21. The Ajantha Engineering Co. Ltd. manufactured and sold 1,000 calculators in 2017. The following are the particulars regarding the calculators sold and manufactured by them.

Particulars	`
Cost of Materials	1,60,000
Wages paid	2,40,000
Manufacturing expenses	1,00,000
Salaries	1,20,000
Rent, Rates & Insurance	20,000
Selling expenses	60,000
General expenses	40,000
Sales	8,00,000

The Company desires to supply 200 calculators to a commercial concern. You are required to prepare a statement showing the price at which calculators should be sold so as to show a profit of 10% on the selling price.

The following additional information is supplied to you:

(i) The price of materials will rise by 20% on the previous year's level.

(ii) Wages will rise up by 5%.

(iii) Manufacturing expenses will rise by 10%.

(iv) Office and selling expenses per unit will remain the same.

Sol : **(Dec.-18(KU)**

Estimated Cost Sheet for Year 2017 (1000 Radio Sets)

Particulars	Cost Per Unit	Amount (`)	Total Amount (`)
Cost of Materials	160		16,00,000
Wages Paid	240		2,40,000
Prime Cost	400		4,00,000
Factory Overheads:			
Manufacturing Expenses	100		1,00,000
Works Cost	500		5,00,000
Administrative Overheads			
Salaries		1,20,000	
Rents, Rates & Insurance		20,000	
General Expenses		40,000	1,80,000
Cost of Production	680		6,80,000
Selling and Distribution Overheads:			
Selling Expenses	60		60,000
Cost of Sales	740		7,40,000
Profit			60,000
Sales	800		8,00,000

Quotation Price/Estimate for 2017 (200 Radios)

Particulars		Amount (`)
Cost of materials (` 160 @ 200)	32,000	
Add: 20% on Cost of Materials	6,400	38,400
Wages paid (240 @ 200)	48,000	
Add: 5% on wages paid	2,400	50,400
Prime Cost		88,800
Factory Overheads :		
Manufacturing Expenses (` 100 @ 200)	20,000	
Add: 10% on manufacturing expenses	2,000	22,000
Works Cost		1,10,800
Administrative Overheads (` 180 @ 200)		36,000
Cost of Production		1,46,800
Selling and Distribution Expenses (` 60 @ 200)		12,000
Cost of Sales		1,58,800
Profit (10% on Selling Price)		17,644
Sales		**1,76,444**

22. The following figures have been taken from the books of a firm.

Particulars	Rs.	Particulars	Rs.
Raw Materials Opening	**80,000**	**Finished Goods Opening**	**20,000**
Raw Materials - Closing	**60,000**	**Finished Goods - Closing**	**30,000**
Purchase of Raw Materials	**3,00,000**	**Direct Wages**	**2,40,000**
Factory Expenses	**2,40,000**	**Office Expenses**	**1,00,000**
Sales	**9,79,000**		

What should be the quotation of a job requiring Rs.4,000 in material and Rs.6,000 in Direct Wages

Sol : **(July-21)**

Standard Showing the Quotation

Particulars	Amount (`)
Direct Material	4,000
Direct Wages	6,000
I. Prime Cost	10,000

Add:	Factory overheads / Expenses	6,000
	(100% on Direct wages) (6000×100%)	
	II. Factory Cost	16,000
Add:	Office overheads / Expenses	
	(12.5%) on factory cost) (16,000×12.5%)	2,000
	III. Total Cost	18,000
	+ Profit	
	10% on total cost (18,000×10%)	1,800
	Sales	19,800

Work Note :

(a) Factory expenses are 100% on direct wages, so apply the same % for Quotation.

(b) Office expenses are 12.5% on factory cost, so apply the same % for Quotation.

23. From the following, prepare a Cost Sheet and Quote a suitable prices.

Total production	**5,000 tons**
Cost of Raw Material	**` 20,00,000**
Carriage Inwards	**` 2,00,000**
Direct wages	**` 20,00,000**
Indirect wages	**` 1,00,000**
Office Expenses	**` 10,00,000**
Selling Overheads	**` 10,00,000**
Payment of Income Tax	**` 3,00,000**
Dividend paid	**` 5,00,000**

A profit Margin of 50% on cost in desired.

Sol : **(Dec.-19)**

Cost Sheet

Particulars	Amount	Cost Per Unit
Cost of Rawmaterial	20,00,000	400
Carriage Inwards	2,00,000	40
Direct wages	20,00,000	400
Prime Cost	42,00,000	840
(+)Factory Overheads		
Indirect wages	1,00,000	20
Factory cost	43,00,000	860
(+) Office Overheads		
Office Expenses	10,00,000	200
Cost of Production	53,00,000	1,060

Calculation of Quotation Price

Particulars	Amount	Cost Per Unit
Cost of Production	53,00,000	1060
(+) Selling and Distribution		
Selling overheads	10,00,000	200
Cost of sales	63,00,000	1,260
(+) Profit (50% on cost	31,50,000	630
Selling price	94,50,000	1,890

4.4 JOB COSTING

4.4.1 Features

Q5. Define job costing? Explain the features

(OR)

Explain Job Costing.

Ans : **(Dec.-19, Dec.-18, July-19)**

Meaning

Job costing is a type of specific order costing which is applicable to the work that is undertaken for meeting the specific requirement of customer. It is generally a short duration.

Features

The main-Features of Job Costing are:-

1. Each Job is separately identifiable.
2. Each Job is unique. It has its own special characteristics. For example, the time required to complete the job will vary from job to job.
3. Each job is a separate cost unit. Each job is assigned a specific job order number. All costs incurred to complete the job are recorded against the job order number.
4. Jobs are generally posted after the completion of Jobs.
5. A unique feature of Job Costing is that there is no inventory. There is no opening or closing stock of either raw-material or finished goods. Production is against customer's orders and not for stock.
6. In case of Job Costing, production is intermittent. It need not be continuous. Sometimes, there may not be any jobs to execute.

Q6. Explain the advantages of Job costing?

Ans : **(Dec.-18)**

1. The costs may be ascertained at any stage of completion of a job. This gives scope for control of costs by taking suitable steps.
2. The profit earned from each job is known separately in Job costing.
3. On completion of a job, each element of cost, selling price and profit can be compared with the

estimates for the purpose of cost control and reduction so that the profit on each job is maximized in job costing.

4. Management can estimate the cost of job on the basis of past records in job costing.
5. The actual costs of previous job can be compared with present job executed.
6. The overhead recovery rates may be predetermined on the basis of budgets.

4.4.2 Objectives

Q7. Explain the objectives of Job costing?

Ans :

Job Costing aims to achieve the following objectives:

1. To ascertain the cost of each job and to find the profit or loss made on each Individual Job.
2. To estimate the resources required and the expenses that need to be incurred to take a job, so that proper quotation can be given to the customer requesting for the job.
3. To track the progress on each job and take corrective action if necessary
4. To ascertain the value of work-in-progress on different jobs.
5. To help the management in controlling costs by comparing the actual costs incurred on completing a job with the estimated / budgeted costs for the same.
6. To facilitate transition from one person to another and from one process to another
7. To identify profitable and non profitable jobs and prevent non profitable or loss making jobs from being taken up
8. To enable any changes to the job being undertaken on the basis of a change in requirement of the customer and make appropriate changes to the amount chargeable to the customer on account of the change.

4.4.3 Procedure & Preparation of Job Sheet

Q8. Explain the procedure and preparation of job sheet?

Ans :

The following steps are taken in job costing :

1. Job number

When an order has been accepted, an individual job number must be assigned to each such job so that separate jobs are identifiable at all stages of production. Assignment of job numbers also facilitates reference for costing purposes in the ledger and is conveniently short for use on various forms and document.

2. Production order

The Production Control Department then makes out a Production Order thereby authorizing to start work on the job. Several copies of production older are prepared, the copies often being in different colours to distinguish them more easily. These copies are passed on to the following :

(i) All departmental foremen concerned with the job;

(ii) Storekeeper for issuing of materials; and

(iii) Tool room for an advance notification of tools required.

Production Order

Name of the Customer..... Job No.....

Date of Commencement..... Date.....

Date of Completion..... Bill of Material No.....

Special Instructions..... Drawing attached Yes/No.....

Quantity	Description	Machines to be used	Took required

(Sign.).....

Production authorised by:

Head of Production Control Deptt.

Fig. (a): Production Order for Job

Proforma of a Production Order is given in Figure. The columns provided in the production order differ widely, depending largely upon the nature of production. Sometimes orders are accompanied by the blue prints and contain a bill of materials and detailed instructions as to which tools and machinery are to be used.

3. Job cost sheet

The unique accounting document under job costing is the job cost sheet. Receipt of production order is the signal for the cost accountant to prepare a job cost sheet on which he will record the cost of materials used and the labour and machine time taken. Each concern has to design a job cost sheet to suit its needs. A simple proforma of job cost sheet is given in Figure.

Job cost sheets are not prepared for specified periods but they are made out for each job regardless of the time taken for its completion. However, material, labour and overhead costs are posted periodi-cally to the relevant cost sheet. The material, labour and overhead to be absorbed into jobs are collected and recorded in the following way :

(a) Direct materials: Material Requisitions or Bill of Materials show the quantities of materials issued to jobs from store. When copies of these documents reach the cost office, they are priced and entered in the stores ledger account in the "Issues" column. Each requisition shows the job number to which the material is to be charged.

(b) Direct wages: Wages payable to workers are calculated on clock cards, job cards, time sheets, etc. The summaries of job cards are made on Wages Abstract or Wages Analysis Sheets, which

shows the direct wages chargeable to each job. The total of wages chargeable to various jobs is debited to work-in- progress control account.

(c) Direct expenses: These can be identified with specific jobs and are directly charged to these jobs.

Job Cost Sheet

Customer..... Job No.....

Date of Commencement..... Date of Completion.....

Material Cost			Lobour Cost				Factory Overheead(Absorbed)			
Date	Material Req. No.	Amount `	Date	Hours	Rate `	Amount `	Department	Hours	Rate	Amount `
	Total		Total				Total			

Profit/Loss		Cost Summary		
	`			`
Price Quoted	xxx	Materlas		xxx
Less: Cost Price	xxx	Labour		xxx
Profit or Loss	xxx		**Prime Cost**	xxx
		Factor overhead		xxx
			Work Cost	xxx
		Administrative overhead		xxx
			Cost of Production	xxx
		Selling and distribution overhead		xxx
			Total Cost	xxx

Fig. (b): Job Cost Sheet

(d) Overheads: These comprising of indirect materials, indirect wages and indirect expenses which cannot be identified with specific jobs are distributed to cost centres. Absorption of overhead by the jobs passing through the cost centres is based upon percentage of direct wages or direct material cost, direct labour hours or machine hours, etc.

The direct materials, wages and expenses and the overheads absorbed are totalled to give the total cost.

Completion of jobs: When jobs are completed, the cost is transferred to cost of sales account. The total cost of jobs completed during each period is deducted from the sales to determine the profit or toss for the period.

PROBLEMS ON JOB COST SHEET

24. The following information is extracted from the job ledger of Devi Enterprises in respect of Job No. 454

Materials ` 6,800; Wages 100 hours @ ` 5

Variable Overheads incurred for all Job ` 10,000 for 5,000 labour hours

Find the profit if the job is billed for ` 9,000

Sol : **(Dec.-19)**

Job cost sheet of Devi Enterprises of Job No. 454.

Particulars	Amount
Materials	6,800
Wages (100 hours × 5)	500
Variable Overheads (100 hours × 2)	200
Cost of the Job	7,500
(+) Profit	1,500
Billed Amount	9,000

Hence, profit of the Job No. 454 is ` 1500.

Working Notes:

Rate of variable overheads per hour = $\frac{10,000}{5,000}$ = 2 ` per hour

---

25. Following particulars relate to Job No. 323

Materials used ` 500

Direct Wages	Variable Overheads
X – 10 hours @ ` 2.50 per hour	X – 7,000 labour hours = ` 7,000
Y – 8 hours @ ` 3.00 per hour	Y – 3,000 labour hours = ` 6,000
Z – 5 hours @ ` 4.00 per hour	Z – 1,000 labour hours = ` 4,000

Fixed overheads estimated at ` 30,000 for 7,500 normal working hours.

You are required to calculate the cost of Job No. 323 and calculate the price to give the profit of 33 $\frac{1}{3}$ % on selling price.

Sol :

JOB SHEET NO. 323

Particulars	`	`
Materials		500
Wages		
X (10 hours × ` 2.50)	25	
Y (8 hours × ` 3.00)	24	
Z (5 hours × ` 4.00)	20	
Prime Cost		69
		569
Add: Overheads		
X (10 × ` 1)	10	
Y (8 × ` 2)	16	
Z (5 × ` 4)	20	46
		615
Add: Fixed Overheads (For 23 hours @ ` 4)		92
Cost of Production		707
Add: Profit $33\frac{1}{3}$% on sale price 707 × (33.33/66-67)		354
Selling Price		1,061

Working Note

Variable Overheads

for X = ` 7,000 / 7,000 = ` 1 per hour

Y = ` 6,000 / 3,000 = ` 2 per hour

Z = ` 4,000 / 1,000 = ` 4 per hour

Fixed Overheads = ` 30,000 / 7,500 = ` 4 per hour

26. The following direct costs were incurred on Job No. 415 of Standard Radio Company.

Materials ` 4,010

Wages:

Department A — 60 hours @ ` 3 per hr.

B — 40 hours @ ` 2 per hr.

C — 20 hours @ ` 5 per hr.

Overhead expenses for these three departments were estimated as follows:

Variable overheads:

Department A ` 5,000 for 5,000 labour hours

B ` 3.000 for 1,500 labour hours

C ` 2,000 for 500 labour hours

Fixed overheads:

Estimated at ` 20,000 for 10,000 normal working hours.

You are required to calculate the cost of Job 415 and calculate the price to give profit of 25% on selling price.

Sol :

Job Cost Sheet

Job No. 415

Particulars		`	`
Direct Materials :		4,010	
Wages – Department	A — 60 hrs. × ` 3	180	
	B — 40 hrs. × ` 2	80	
	C — 20 hrs. × ` 5	100	360
Variable Overheads:			
Department	A — 60 hrs. @ Re. 1	60	
	B — 40 hrs. @ ` 2	80	
	C — 20 hrs. @ ` 4	80	220
Fixed Overheads : 120 hours @ ` 2			240
	Total Cost		4,830
	Profit — 25% on Selling Price*		1,610
	Selling Price		6,440

27. The following particulars relate to Job No. 323

Materials used Rs. 500

Direct Wages

X 10 hours @ 2.50 per hour

Y 8 hours @ 3.00 per hour

Z 5 hours @ 4.00 per hour

Variable Overheads

X 7000 labour hours Rs. 7,000

Y 3000 labour hours Rs. 6,000

Z 1000 labour hours Rs. 4,000

Fixed overheads Rs. 30,000 for 7500 working hours. You are required to calculate the Cost of Job No. 323 and calculate the Price to give the profit of 33 on Selling Price.

Sol : **(July-19)**

Job Cost Sheet of Job No.323

Particulars	Amount	Amount
Materials		500
Direct Wages		
Dept. X (10 Hours @ 2/50 Per Hour)	25	
Dept. Y (8 Hours @ 3 Per Hour)	24	
Dept. Z (5 Hours @ 4 Per Hour)	20	69
I. Prime Cost		569
Add : Variable overheads		
Dept. X (10 Hours @ 1 Per Hour)	10	
Dept. Y (8 Hours @ 2 Per Hour)	16	
Dept. Z (5 Hours @ 4 Per Hour)	20	46
		615
Add : Fixed overheads		
Dept. X, Y & Z together worked		
for 10 + 8 + 5 = 23 Hours @ 4 Per Hour		92
II. Total Cost		707
Add : Profit (33 $^{1}/_{3}$ on sales)		353
Sales		1,060

Working Notes :

1. Calculation of variable overhead rate per hour

Departments	=	$\frac{\text{Amountt}}{\text{Labour Hours}}$
X	=	$\frac{7,000}{7,000 \text{ Hrs}}$ = ` 1 Per Hour
Y	=	$\frac{6,000}{3,000 \text{ Hrs}}$ = ` 2 Per Hour
Z	=	$\frac{4,000}{1,000 \text{ Hrs}}$ = ` 4 Per Hour

2. Calculation of Fixed overhead rate per hour

$$\frac{\text{Amount}}{\text{Working Hours}}$$

$$\frac{30,000}{7,5000 \text{ Hrs}} = \text{` } 4 \text{ Per Hour}$$

3. Calculation of Profit

Assume sales as		100.00
(–) Profit (33 $^1/_3$)		33.33
Total Cost 1		66.67

If total cost is 66.67 – Profit is 33.33

If total cost is 707 – ?

$$= 707 \times \frac{33.33}{66.67} = \text{` } 353$$

28. Following information extracted from costing records of a company, in respect to

Job No : 100

Material : Rs. 4000

Wages :

A 80 hours @ Rs. 4 per hour

B 70 hours @ Rs. 3 per hour

C 50 hours @ Rs. 5 per hour

Factory overheads :

A Rs. 8000 for 8000 hours

B Rs. 4000 for 2000 hours

C Rs. 2000 for 1000 hours

Fixed overheads : Rs. 9000 for 9000 hours

your are required to calculate the price to be changed so on to give a profit of 20% on selling price.

Sol : **(Dec.-18)**

Working Notes:

1. Calculation of Factory Overheads Cost Per Unit

$$\text{Dept A} = \frac{8,000}{8,000 \text{ Hrs}} = ` 1 \text{ Per Hour}$$

$$\text{Dept B} = \frac{4,000}{2,000 \text{ Hrs}} = ` 2 \text{ Per Hour}$$

$$\text{Dept C} = \frac{2,000}{1,000 \text{ Hrs}} = ` 2 \text{ Per Hour}$$

2. Calculation of fixed cost per hour

$$\frac{9,000}{9,000 \text{ Hrs}} = ` 1 \text{ Per Hour}$$

3. Calculation of Selling price

Assume sales as 100. In that profit is 20.

Total cost is 100 – 20 = ` 80

If Total cost is ` 80 – selling price is ` 100

Total cost is 5,300 – ?

$$\frac{100}{80} \times 5,300 = ` 6,625$$

Cost Sheet of Job. No 100 of a Co., for the period

Particulars	`	`
Direct Materials		4,000
Direct wages		
Dept A 80 hrs @ 4 per hour	320	
Dept B 70 hrs @ 3 per hour	210	
Dept C 50 hrs @ 5 per hour	250	780
I . Prime cost		4,780
Add : Factory overheads		
Dept A 80 hrs @ 1 per hour	80	
Dept B 70 hrs @ 2 per hour	140	
Dept C 50 hrs @ 2 per hour	100	320
		5,100
Add : Fixed overheads		
Dept A + B + C together worked for		
80 + 70 + 50 = 200 hrs @ 1 per hour		200
Total cost		5,300
(+) Profit		1,325
Sales		6,625

29. Following information has been extracted from the costing records of Vinay Engineering Works, Hyderabad in respect of Job No. 75.

Materials ` 20,000

Department A 80 hours @ ` 8 per hour

Department B 70 hours @ ` 6 per hour

Department C 50 hours @ ` 10 per hour

Variable Overheads :

Department A ` 80,000 for 8,000 direct labour hours

Department B ` 4,000 for 2,000 direct labour hours

Department C ` 2,000 for 1,000 direct labour hours

Fixed overheads :

Estimate at ` 9,000 for 9,000 normal working hours. You are required to calculate the price to be charged so as to give a profit of 20% on selling price.

Sol : **(Dec.-18(MGU)**

Cost Sheet for Job No. 75

Particulars	Amount	Amount
Materials		20,000
Wages		
A – 80 × 8	640	
B – 70 × 6	420	
C – 50 × 10	500	1,560
Overheads		21,560
A – 80 × 1	80	
B – 70 × 2	140	
C – 50 × 2	100	320
Fixed $\left(\frac{9000}{9000}\right) = 200 \times 1$		200
Cost of Job		22,080
Profit		5,520
Selling price		27,600

Working Notes:

Calculation of Profit

$$= 22{,}080 \times \frac{20}{80} = 5{,}520$$

Profit = 5,520.

30. Following information in respect of Job No. 222 is given below:

Materials ` 5,800

Wages

Department A - 100 hours @ ` 5 per hour

Department B - 200 hours @ ` 3 per hour

Overheads for the two departments are estimated as

(a) Variable Overheads:

Department A - ` 10,000 for 5,000 direct labour hours

Department B - ` 30,000 for 10,000 direct labour hours

(b) Fixed Overheads:

Rs. 50,000 for 50,000 normal working hours.

Calculate the cost of this job and also the price to be charged so as to give a profit of 20% on selling price.

Ans : **(Dec.-19)**

Cost Sheet Job No. 222

Particulars	**Amount**	**Amount**
Materials		5,800
Wages		
A – 100 hours × 5	500	
B – 200 hours × 3	600	1,100
Prime cost		6,900
Overheads		
Variable Overheads		
A = $\frac{10,000}{5,000}$ = 2 × 100 hours	200	
B = $\frac{30,000}{10,000}$ = 3 × 200 hours	600	800
Fixed heads = $\frac{50,000}{50,000}$ (300 × 1)		300
Cost of Job		8,000
Profit $\left(8,000 \times \frac{1}{4}\right)$		2,000
Selling price		10,000

Exercise Problems

1. From the following information prepare a statement of cost of production for the year 1993:

   Opening stock of raw materials ` 1,44,000; Purchase of raw material ` 8,64,000; Closing stock of raw materials ` 2,16,000; Direct wages ` 3,60,000.

   Calculate factory overheads @ 20% on prime cost and office overheads 80% of factory overheads.

   [Ans: ` 15,66,720]

2. A factory produces 100 units of a commodity. The cost of production is: Direct material ` 10,000; Direct Wages ` 5,000; Direct expenses ` 1,000 Factory overheads ` 6,500; Administrative overheads ` 3,480.

   If profit of 25% on sales is to be realized, what would be the selling price of each unit of the commodity?

   [Ans: Price per unit ` 346.40]

3. Calculate prime cost, given that the work in progress is valued at prime cost Opening Stock: raw materials: ` 4,000; Work in Progress: ` 6,000; Materials Purchased ` 49,000; Direct wages ` 30,000; Direct Expenses ` 9,000; Closing Stock: Raw material: ` 3,000; Work in Progress: ` 5,000.

   [Ans: Prime Cost: ` 90,000]

4. Ascertain Profit from the following:

   Cost of Production ` 44,000 for 11,000 units, Selling expenses Re.0.40 p. per unit, sales ` 54,000 for 9,000 units.

   [Ans: Profit `14,400]

5. Mr. Gopal furnishes the following data relating to the manufacture of B standard product for the month of April 1980.

   Raw materials consumed ` 15,000

   Direct Labour charges ` 9,000

   Machine hours worked 900 Machine hour rate ` 5.

   Administrative overheads 20% on works cost

   Selling overheads Re. 0.50 per unit

   Units Produced 17,100

   Units sold 16,000 at ` 4 per unit

   You are required to prepare a cost sheet from the above showing:

   (A) cost per unit (B) Profit per unit sold and profit for the period

   [Ans: Profit `24,000)) (Ans: `156]

6. The following figures have been taken from the books of a firm.

Raw materials - Opening stock	` 40,000
Raw materials - Closing stock	` 30,000
Finished goods - Opening stock	` 10,000
Finished goods - Closing Stock	` 15,000
Purchase of raw materials	` 1,50,000

Direct wages	` 1,20,000
Factory expenses	` 1,20,000
Office expenses	` 50,000
Sales	` 4,89,500

What should be the quotation of a job requiring ` 2,000 in materials and `3,000 in direct wages.

[Ans: ` 9,900]

7. Op-30th April, 1981 a manufacturer was required to quote contract for the supply of 1,000 Electric stoves. From the following data, prepare a statement showing the price to be quoted to give the same percentage of net profit on turnover as was realized during the six months to 31st March, 1981.

Stock of materials, 01-10-1980	` 35,000
Stock of materials, 31-10-1981	` 4,900
Purchase of materials, 6 months to 31-03-1981	` 52,500
Factory wages 31-03-1981	` 95,000
Factory expenses 31-03-1981	` 17,500
Establishment expenses 31-03-1981	` 10,000
Completed stock in hand, 01-10-1980:	Nil
Completed stock in hand, 31-03-1981	` 35,000
Sales	` 1,89,000

The number of stoves manufactured during the six months was 4,000 including those sold and those in stock at the close of the period. The stoves to be quoted for a uniform quality and similar to those manufactured during six months to 31-03-1981. As from 01-04-81 the cost of factory labour had increased by 10% and materials cost by 15%.

[Ans: Estimate for 1,000 stoves ` 63,053]

8. Following information has been extracted from the costing records of Jay Engineering Works. Hyderabad in respect of Job No. 50. Materilas

Wages : ` 4,000

Department A 80 hours @ ` 4 per hour

Department B 70 hours @ ` 3 per hour

Department C 50 hours @ ` 5 per hour

Variable overheads:

Department A 8,000 for 8,000 direct labour hours.

Department B 4,000 2,000 direct labour hours.

Department B 2,000 1,000 direct labour hours.

Fixed overheads

Estimated at ` 9,000 for 9,000 normal working hours. You are required to calculated the price to be charged so as to give a profit of 20% on selling price.

[Ans : ` 6,625]

Short Question and Answers

1. Unit costing

Ans :

Unit costing is a method of costing by units of production and is adopted where production is uniform and a continuous affair, units of output are identical and the cost units are physical and natural. The cost per unit is determined by dividing the total cost during a given period by the number of units produced during that period. This method of costing is generally adopted where an undertaking is engaged in producing that period. This method of costing is two or more products of the same kind but of varying grades or quality.

2. Features of Unit Costing

Ans :

Following are the characteristics features of the industries where unit costing is used :

i) Production consists of a single product or a few products.

ii) Large number / quantity of identical units are produced with identical costs.

iii) Production is more or less of standard quality.

iv) Production is performed on continuous basis.

v) Cost units are physical and natural e.g. number of bricks, ton of cement, meters of cloth, litres of milk.

3. Cost sheet

Ans :

Cost sheet is "a document which provides for the assembly of the detailed cost of a cost centre or cost unit". Thus cost sheet is a periodical statement of cost designed to show in detail the various elements of cost of goods produced like prime cost, factory cost of production and total cost. It is prepared at regular intervals, e.g., weekly, monthly, quarterly, yearly, etc. Comparative figures of the previous period may also be shown in the cost sheet so that assessment can be made about the progress of the business.

4. Purposes of Cost Sheet

Ans :

i) It reveals the total cost and cost per unit of goods produced.

ii) It discloses the break-up of total cost into different elements of cost.

iii) It provides a comparative study of the cost of current period with that of the corresponding previous period.

iv) It acts as a guide to management in fixation of selling prices and quotation of tenders.

5. Features of Job Costing

Ans :

The main-Features of Job Costing are:-

i) Each Job is separately identifiable.

ii) Each Job is unique. It has its own special characteristics. For example, the time required to complete the job will vary from job to job.

iii) Each job is a separate cost unit. Each job is assigned a specific job order number. All costs incurred to complete the job are recorded against the job order number.

iv) Jobs are generally costed after the completion of Jobs.

6. Objectives of Job Costing

Ans :

Job Costing aims to achieve the following objectives:

i) To ascertain the cost of each job and to find the profit or loss made on each Individual Job.

ii) To estimate the resources required and the expenses that need to be incurred to take a job, so that proper quotation can be given to the customer requesting for the job.

iii) To track the progress on each job and take corrective action if necessary

iv) To ascertain the value of work-in-progress on different jobs.

v) To help the management in controlling costs by comparing the actual costs incurred on completing a job with the estimated / budgeted costs for the same.

vi) To facilitate transition from one person to another and from one process to another

vii) To identify profitable and non profitable jobs and prevent non profitable or loss making jobs from being taken up

7. Production order

Ans :

The Production Control Department then makes out a Production Order thereby authorising to start work on the job. Several copies of production older are prepared, the copies often being in different colours to distinguish them more easily. These copies are passed on to the following :

(i) All departmental foremen concerned with the job;

(ii) Storekeeper for issuing of materials; and

(iii) Tool room for an advance notification of tools required.

8. Job cost sheet

Ans :

The unique accounting document under job costing is the job cost sheet. Receipt of production order is the signal for the cost accountant to prepare a job cost sheet on which he will record the cost of materials used and the labour and machine time taken. Each concern has to design a job cost sheet to suit its needs.

9. Direct materials

Ans :

Material Requisitions or Bill of Materials show the quantities of materials issued to jobs from store. When copies of these documents reach the cost office, they are priced and entered in the stores ledger account in the "Issues" column. Each requisition shows the job number to which the material is to be charged.

10. Overheads

Ans :

These comprising of indirect materials, indirect wages and indirect expenses which cannot be identified with specific jobs are distributed to cost centres. Absorption of overhead by the jobs passing through the cost centres is based upon percentage of direct wages or direct material cost, direct labour hours or machine hours, etc. These methods of absorption have also been discussed in detail in the chapter on Overheads.

The direct materials, wages and expenses and the overheads absorbed are totalled to give the total cost.

Choose the Correct Answer

1. Factory overhead can be charged on the basis of [a]

   (a) Material cost (b) Labour cost

   (c) Prime cost (d) Direct expenses

2. Office and administrative expenses can be charged on the basis of _____. [c]

   (a) Material cost (b) Labour cost

   (c) Prime cost (d) Factory cost

3. Selling and distribution expenses can be charged on the basis [c]

   (a) Material cost (b) Labour cost

   (c) Prime cost (d) Factory cost

4. One of the most important tools in cost planning is [c]

   (a) Direct cost (b) Budget

   (c) Cost sheet (d) Marginal costing

5. An example of variable cost is [c]

   (a) Property tax (b) Interest on capital

   (c) Direct material cost (d) Depreciation of machinery

6. Cost accounting concepts include all the following except [c]

   (a) Planning (b) Controlling

   (c) Profit sharing (d) Product costing

7. The components of factory overhead are as follows: [b]

   (a) Direct material + indirect material + direct expenses

   (b) Indirect material + Indirect labor + others indirect cost

   (c) Direct material + indirect expenses + indirect labor

   (d) Direct labor + indirect labor + indirect expenses

8. Which of the following costs is not a factory overhead expense? [a]

(a) Depreciation of equipment used in the research department

(b) Salary of quality control inspector

(c) Overtime premium paid to direct labour

(d) Machine maintenance labour cost

9. Cost of production is equal to [d]

(a) Prime costs + other manufacturing costs.

(b) Production costs + Administration expenses.

(c) Prime costs + Manufacturing costs + Opening W.I.P – Closing W.I.P.

(d) None of the above.

10. Packing cost is _____. [d]

(a) Production cost (b) Selling cost

(c) Administration cost (d) Distribution cost

Fill in the blanks

1. The _____ sheet is most widely used in case of unit or output costing.
2. The _____ system is used incase of Industries like breweries. Brick works, Diaries, Sugar mills, Paper Mills etc.
3. The system of Cost accounting in which costs are determined per unit of a single product in a continuous manufacturing activity is known as _____.
4. If the information relating to cost incurred, selling price and profits loss during a period is presented in the form of an account, it is called as _____ account.
5. Like cost sheet there is no _____ form for production account which is prepared according to the needs of management.
6. Statement of cost and profit when presented in "T" Form is _____.
7. In _____ costing each Job is a cost unit to which all costs are assigned.
8. _____ is a method of costing adapted by organizations where a large number of identical units are produced.
9. _____ Variable expenses that vary in direct proportion to number units produced.
10. _____ expenses remain fixed in amount irrespective of the number of units produced.

ANSWERS

1. Cost
2. Unit Costing
3. Unit Costing
4. Production
5. Fixedn
6. Production A/c
7. Job
8. Output costing
9. Variable
10. Fixed

UNIT V

CONTRACT AND PROCESS COSTING

Contract Costing: Features – Advantages - Procedure of Contract Costing – Guidelines to Assess profit on incomplete Contracts.

Process Costing: Meaning – Features – Preparation of Process Account – Normal and Abnormal Losses.

5.1 CONTRACT COSTING

5.1.1 Features

Q1. Define contract costing? Explain the feature of contract accounts.

Ans :

Contract costing is that form of specific order costing which applies where the work is undertaken to customer's requirements and each order is of long duration as compared to job costing. The work is generally of constructional nature. A construction contract is a contract for the construction of an asset or of a combination of assets which together constitute a single substantial project. This covers various activities as construction of plants (including site preparation), bridges, roads, dams, ships, buildings, complex pieces of equipment, production of motion pictures etc. That is why this method is used by builders, civil engineering contractors, constructional and mechanical engineering firms etc. These contracts are negotiated in a number of ways.

Features

The work to be executed depends upon customer's specification and is generally done at site. Each contract is treated as cost unit and is generally of long duration for completion. Most of the expenses are direct in nature and payment is received depending on the stage of completion of work. Following are the main distinguishing features of contract accounts :

(i) Higher proportion of direct costs: As most of the items of expenses can be directly identified with a contract, though indirect, are treated as direct expenses. Expenses on telephone installed at site, site power usage, site vehicles, transportation are treated as direct expenses.

(ii) Low indirect cost: The only item of indirect cost may be head office expenses. Such cost represents only a small proportion of the contract cost and is absorbed usually on some overall basis such as percentage of total contract cost.

(iii) Problems of cost control: The large scale of contracts and the size of the site may create some major problems of cost control consuming material usage and losses, pilferage, labour supervision and utilization, damage to and loss of plant and tools etc.

(iv) Surplus materials: Surplus material, if any, will be either credited to the contract account with the cost of material at the end of the contract or will be debited to the new contract account, if directly transferred to another contract. If the material is not required immediately, it will be stored and the cost debited to a stock account.

5.1.2 Advantages

Q2. Explain advantages of contract costing?

Ans :

Advantages

Advantages of Contract Costing are as follows:

1. **Recover of Losses:** The possibility of incurring losses are nil, as all the costs are recovered from the contractee.
2. **Uninterrupted of Work:** No delays will be involved in the completion of work.

3. **Benefits of Cost Plus Contract Method:** This method mostly beneficial if a contract's value is very high.
4. **Simplification:** Working with quotations and tenders are simple.
5. **Fixed Percentage of Profit:** The contractor receives assumed fixed percentage of profit.
6. **Social Justice:** Both the contractor and the contractee gets the benefits of social justice.
7. **Effective Control:** The contract's performance can be controlled effectively by contractee by possessing retention amount.
8. **Use of Escalation Clause by Contractor:** Incorporating escalation clause benefits the contractor if the prices increases.
9. **Use of Escalation Clause by Contractee:** Incorporating escalation clause benefits the contractee if the prices decreases.
10. **Easy Computation of Cost and Profit:** Contract's total cost, cost-per each elements and profit from the contract can easily be assessed by the contractor.

5.1.3 Procedure of Contract Costing

Q3. Explain the procedure of contract cost.

Ans :

A Contract Ledger is maintained in which a separate account is opened for each contract undertaken by a contractor. A Contract Ledger is so ruled out as to give maximum information. A specimen ruling of the same is given below :

CONTRACT LEDGER

Form No..... Contract Price.....

Contract No..... Terms of Payment.....

Site..... Retention Money.....

Completion Date..... Work Certified.....

Remarks..... Date.....`

Date.....`

Dr. Cr.

Date	Particulars	Folio	Materials	Wages	Direct Expenses	Plant	Sub-contract Costs	Establishment Charges	Total	Date	Particulars	Folio	Materials	Wages	Direct Expenses	Plant	Sub-contract Costs	Establishment Charges	Total

The recording procedure of the following items may be noted carefully :

1. Materials

Materials purchased directly or supplied from the store or transferred from other contracts will appear on the debit side. Materials returned to store will appear on the credit side. Amount received from the sale of surplus materials will appear on the credit side, any profit or loss arising from the sale will be transferred to the Profit and Loss Account. Materials stolen or destroyed by fire will be transferred to the Profit and Loss Account. In case any compensation is receivable from the insurance company for loss of materials, the amount due from insurance company is shown in the Balance Sheet. The loss which is not compensated is debited to Profit & Loss Account. Materials in hand at the end of the year will appear on the credit side. Sometimes materials are transferred from one contract to another contract. Contract receiving the materials is debited and the contract giving up the materials is credited. Normal wastage incurred in stores and materials should be charged to contracts by inflating the rates at which materials are priced out. Stores used in the manufacture of tools should be charged to Works Expenses A/c. Sometimes, it happens that the contractee under the terms of the contract, supplies some materials which do not affect the contract price. The value of such material should not be debited to Contract Account but a note will have to be kept to account for the quantity received and issued on a separate memorandum record.

Treatment of material in contract costing is as follows :

Dr. CONTRACT ACCOUNT Cr.

	Particulars	`		Particulars	`
To	Stock of Materials	xx	By	Material transferred to Another Contract	xx
To	Material Issued from Stores	xx			
To	Material Purchases at Site	xx	By	Material Returned to Store	xx
To	Transfer of Material from Another Contract		By	Material Loss	xx
			By	Material Sold	xx
			By	Stock of Material at Site	xx

2. Labour (or) Wages

All labour employed at the contract site should be regarded as direct labour and charged direct to the contract concerned. Where possible, separate wages sheets should be prepared for each contract. If this is not possible, a Wages Analysis Sheet should be prepared wherein should be entered the particulars of the daily or weekly time sheets. The total of each column should be posted to be debit of the appropriate contract. Wages accrued or outstanding at the end of the period should appear on the debit side of the contract account.

3. Site (or Direct) Expenses

All site expenses (other than materials and wages) are charged to individual contract as and when they are incurred.

4. Indirect Expenses (or Overheads)

There are certain expenses (such as salaries of engineers, surveyors, supervisors etc. engaged on various contracts, stores expenses, administrative and office expenses) which cannot be directly charged to contracts. Such expenses may be distributed on several contracts on some suitable basis as a percentage of materials or labour.

5. Plant and Machinery

Careful records of plant and machinery must be maintained to ensure that none is lost or improperly disposed of and that the contract is duly charged for the use of plant.

5.1.4 Proforma of Contract Accounting

Q4. Explain the proforma of contract accounts.

Ans :

While preparing contract account, following proforma is to be prepared,

Dr. Contract No. xxx A/c Cr.

Particulars		Amount	Particulars		Amount
To Materials:			By Materials:		
Purchased		xxx	Returned to stores		xxx
Issued from stores		xxx	Stock at site		xxx
Transferred from other contracts		xxx	Transferred to other contracts	xxx	
To Wages	xxx		By Profit and loss a/c		
Add: Outstanding wages	xxx		Materials lost	xxx	
		xxx	Plant lost	xxx	xxx
To Direct expenses		xxx	By balance of loose tools		xxx
To overhead charges		xxx	By plant returned	xxx	
To Issue of plant		xxx	Less: Depreciation	xxx	xxx
To sub-contract costs		xxx	By sale of plant		xxx
To Issue of loose tools		xxx	By plant at site	xxx	
To cost of extra work		xxx	Less: Depreciation	xxx	
To cost of defective work		xxx	By profit and loss a/c		xxx
To profit and loss a/c		xxx	(Loss on sale of plant)		
(Profit on sale of plan)			By contracts a/c		xxx
To Profit and loss a/c		xxx	(Contract price-incase of		
(Completed contract)			(Incomplete contract		
or			Work certified	xxx	
To Notional profit c/d		xxx	Work uncertified	xxx	
(Incompleted contract)		xxx			xxx
To profit and loss a/c		xxx	By profit and loss a/ c (Loss)		xxx
(profit to be credited)					xxx
To work in progress a/c		xxx	By Notational profit b/d		xxx
(Profit maintained as reserve)					
		xxx			xxx

PROBLEMS ON CONTRACT ACCOUNTS

1. Contract Price Rs.25 Lakhs, Cash Received from the Contractee (being 80% of Work Certified) Rs.12 Lakhs, Uncertified Work Rs.50,000. Actual Expenditure incurred on the Contract Rs.10 Lakhs (including Closing Stock of Materials at Contract Site). Closing Stock at Contract Site Rs.40,000. Calculate the amount of Profit transfer to Profit and Loss Account from the above information.

Sol : **(July-21)**

Dr. Contract Account Cr.

Particulars	`	Particulars		`
To expenses A/c	10,00,000	By Work in progress		
To Notional profit c/d	5,90,000	Certified	1,500,000	
		Uncertified	50,000	
				15,50,000
		By closing stock		40,000
	15,90,000			15,90,000
To P & L A/c	3,14,667	By Notional profit b/d		5,90,000
$\left(\text{Notional Profit} \times \frac{2}{3} \times \frac{4}{5}\right)$				
$5,90,000 \times \frac{2}{3} \times \frac{4}{5}$				
To Reserves A/c	275,333			
	590,000			590,000

Working Notes:

1. Calculation of certified work

$12,00,000 \times \frac{100}{80}$ = ` 15,00,000

2. Calculate the amount of Profit Transferred to Profit of Loss Account from the following: Contract Price Rs. 16,00,000, Cash reserved Rs. 4,90,000 (being 70% of Work Certified), Not Certified Rs. 60,000. Total expenditure incurred Rs. 6,40,000.

Ans : **(July-19)**

Contract A/c

Particulars	`	Particulars	`
		By Work in progress	
To Expenses	6,40,000	Certified	7,00,000
To Notional profit	1,20,000	Uncertified	60,000
	7,60,000		7,60,000
To P & L A/c	2,80,000	By Notional profit	1,20,000
To reserve A/ c	92,000		
	1,20,000		1,20,000

Working Notes :

1. Calculation of work certified

   For 70% of work certified – Cash received is 4,90,000

   For 100% of work certified – ?

$$4,90,000 \times \frac{100}{70} = ` 7,00,000$$

2. Calculation of amount of profit to be transferred to P & L A/c

   Notional profit $\times \frac{1}{3} \times$ % of cash received

$$1,20,000 \times \frac{1}{3} \times \frac{70}{100} = ` 28,000$$

3. Prepare Contract Account from the following

Contract price Rs. 10,00,000. Expenses Incurred Rs. 4,00,000, Work Certified Rs. 8,00,000 Cash received Rs. 6,00,000

Sol : **(Dec.-18)**

Dr. Contract Account Cr.

Particulars	Amount	Particulars	Amount
To Expenses	4,00,000	By Work in progress	
To Notional profit	4,00,000	Certified work	8,00,000
	8,00,000		8,00,000
To profit & Loss A/c	2,00,000	By Notional profit	4,00,000
To Reserves	2,00,000		
	4,00,000		4,00,000

Working Notes:

Calculation of % of work completed

For 1,00,000 contract price - work certified 8,00,000

100 – ?

$$\frac{8,00,000}{1,00,000} \times 100 = 80\%$$

Hence the following formula is applied

$$\text{Notional profit} \times \frac{2}{3} \times \frac{\text{cash received}}{\text{work certified}}$$

$$4,00,000 \times \frac{2}{3} \times \frac{6,00,000}{8,00,000} = ` 2,00,000$$

4. Write up the Contract account from the following details.

Particulars	Rs.
Direct materials	16,200
Wages	10,800
Special plant	8,000
Stores issued	2,880
Loose tools	1,500
Cost of tractor (Fuel, wages of driver and expenses of workers)	3,420
Contract price	40,000

The contract was completed in 20 weeks. The special plant was returned to stores subject to depreciation at 20% on original cost. The value of loose tools and stores returned were Rs. 1,000 and Rs. 400 respectively. The written down value of Tractor used for the contract was Rs. 19,500 and depreciation was to be charged to this Tractor of 20% per annum on this value. Provide 7% for administrative expenses on works cost.

Sol :

Dr. Contract A/c Cr.

Particulars	Rs.	Particulars	Rs.
To Materials	16,200	By Contract price	40,000
To Wages	10,800		
To Special plant depreciation $\left[8000 \times 20\% \times \frac{20}{52}\right]$	615		
To Stores issued	2880		
To Loose tools	1500		
To Tractor exp.	3420		
To Depreciation on tractor $\left[19500 \times 20\% \times \frac{20}{52}\right]$	1500		
Works Cost	36,915		
(+) To Administrative O.H. [7% of 36915]	2584		
Total cost	39,499		
Profit	501		
	40,000		40,000

5. A building contractor have undertaken construction work at contract price of Rs. 6,00,000. The following are the particulars from 1st January 2012 to 31-12-2012.

Material	**Rs. 1,20,000**
Wages	**Rs. 1,38,000**
Plant	**Rs. 30,000**
General expenses	**Rs. 11,100**

Cash received upto to December 2012 Rs. 2,70,000 being 80% of the work certified the value of material on hand Rs. 8100. The work not yet certified Rs. 7500. Depreciation on plant 10% per annum, prepare contract account and state the proportion of profit credited to profit and loss account.

Sol :

Dr. Contract Account Cr.

Particulars	Rs.	Particulars	Rs.
To materials	1,20,000	By work certified	3,37,500
To wages	1,38,000	$\left[27,0000 \times \frac{100}{80}\right]$	
To plant (opening)	30,000	By work uncertified	7,500
To general expenses	11,100	By materials (closing)	8,100
To Notional profit c/d	81,000	By plant [closing]	
		[opening - depreciation]	27,000
		[30,000 – 3,000]	
	3,80,100		3,80,100
To Profit and Loss A/c	43,200	By Notional profit b/d	81,000
$\left[81,000 \times \frac{2}{3} \times \frac{2,70,000}{3,37,500}\right]$			
To general reserve c/d	37,800		
	81,000		81,000

Working Notes:

Calculation of work completed %

For 6,00,000 [Contract price] = 100

For 3,37,500 (work certified) = ?

$$\frac{3,37,500 \times 100}{60,000} = 56.25\%$$

6. Prepare a contract account from the following particulars.

Particulars	Rs.
Materials issued from stores	2,00,000
Materials purchased	1,60,000
Plant installed at site	50,000
Establishment charges	40,000
Materials returned to stores	10,000
Wages paid	1,40,000
Wages accrued	20,000
Direct expenses	6,000
Indirect expenses	14,000
Materials transferred to another contract	30,000
Materials on hand	40,000
Depreciation on plant	20%
Contract price	10,00,000
Works certified	5,00,000
Cost of work not yet certified	50,000
Cash received from the contractee	4,00,000

Sol :

Dr. Contract Account Cr.

Particulars	Rs.	Particulars	Rs.
To materials issued	2,00,000	By work certified	5,00,000
To materials purchased	1,60,000	By work uncertified	50,000
To plant installed at site	50,000	By material returned to store	10,000
To establishment charges	40,000	By materials transferred to another contract	30,000
To wages (1,40,000 + 20,000)	1,60,000	By materials on hand	40,000
To direct expenses	6,000	By plant (closing)	40,000
To indirect expenses	14,000	(50,000 – 10,000)	
To Notional profit c/d	40,000		
	6,70,000		6,70,000
To P & L A/c $\left[40,000 \times \frac{2}{3} \times \frac{4,00,000}{5,00,000}\right]$	21,333	By Notional profit b/d	40,000
To reserve a/c c/d	16,667		
	40,000		40,000

Calculation of Work Completed%

For 10,00,000 [contract price] – [work certified] Rs. 5,00,000.

For 100 – ?

$$\frac{5,00,000 \times 100}{10,00,000} = 50\%$$

7. A contractor has undertaken construction work at contract price of Rs. 12,00,000 on 1-4-2010. The following are the particulars of the contract upto 31-3-2011.

Particulars	Rs.
Material purchased	**2,00,000**
Material issued from stores	**8,000**
Indirect expenses	**70,000**
Labour	**2,02,000**
Plant	**2,81,000**
Material in hand	**15,000**
Material lost by fire	**5,000**
Material at site on 31.3.2011	**8,000**
Plant at site	**2,40,000**

Cash received on account upto 31-3-2011 amounted to Rs. 4,48,000 which represent 80% of work certified. Work not certified represent Rs. 80,000. Prepare contract account and show the amount to be transferred to profit and loss account. Also prepare contractee account and show how the items appear in Balance Sheet.

Sol :

Dr. Contract Account Cr.

Particulars	Amount	Particulars	Amount
To Materials purchased	2,00,000	By Material lost by fire	5,000
To Materials issued	8,000	By Closing material	8,000
To Indirect expenses	70,000	By Plant (closing)	2,40,000
To Labour	2,02,000	By Work certified	5,60,000
To Plant	2,81,000	$\left(4,48,000 \times \frac{100}{80}\right)$	
To Material in hand	15,000	By Work uncertified	80,000
To Notional profit c/d	1,17,000		
	8,93,000		8,93,000
To Profit & Loss A/c.	62,400	By Notional profit b/d	1,17,000
$\left(1,17,000 \times \frac{2}{3} \times 80\%\right)$			
To Reserve A/c. c/d	54,600		
	1,17,000		1,17,000

Calculation of work certified%

For 12,00,000 (contract price) = 100

For 5,60,000 (work certified) = ?

$$\frac{5,60,000 \times 100}{12,00,000} = 46.67\%$$

It is between 25% to 49% hence the following formula is applied

$$\left[\text{Notional profit} \times \frac{2}{3} \times \text{Cash Received \%}\right]$$

Dr. Contractee Account Cr.

Particulars	Amount	Particulars	Amount
To Balance c/d	1,28,000	By Cash A/c.	1,28,000
	1,28,000		1,28,000

Balance Sheet as on 31-3-2011

Liabilities	Rs.	Rs.	Assets	Rs.	Rs.
Profit & Loss	62,400		Work-in-progress		
(–) Loss of materials	5,000	57,400	Work certified	5,60,000	
			Work uncertified	80,000	
				6,40,000	
			(–) Reserve	54,600	
				5,85,400	
			(–) Cash Received	4,48,000	1,37,400
			Material (Closing)		8,000
			Plant (Closing)		2,40,000

8. The following expenditure was incurred on a contract of ` 12,00,000 for the year ending 31-12-2017.

`

Materials	**2,40,000**
Wages	**3,28,000**
Plant	**40,000**
Overheads	**17,200**

Cash received on account of the contract to 31st Dec., 2017 was ` 4,80,000, being 80% of the work certified. The value of materials in hand was ` 20,000. The plant had undergone 20% depreciation.

Prepare Contract Account.

Sol : **(Dec.-18)**

Contract Account for the year ending 31st December, 2017

Particulars	`	Particulars	`
To Materials	2,40,000	By Materials in hand	20,000
To Wages	3,28,000	By Plant in hand (40,000 less 20%)	32,000
To Plant	40,000		
To Overheads	17,200	By Work-in-Progress	
To Notional Profit c/d	26,800	Work certified $\left(4,80,000 \times \frac{100}{80}\right)$	6,00,000
	6,52,000		6,52,000
To Profit & Loss A/c (26,800 × 2/3 × 80%)	14,293	By Notional Profit b/d	26,800
To Reserve	12,507		
	26,800		26,800

Working Notes

1) Calculation of certified work

If Certified Work is 80% – cash received ` 4,80,000

100 % – ?

$$\frac{4,80,000}{80} \times 100 = ` 6,00,000$$

2) Calculation of % of work completed

For ` 12,00,000 contract - work certified ` 6,00,000

100 ?

$$\frac{6,00,000}{12,00,000} \times 100 = 50\%$$

Hence the following formula is applied to transfer a portion of notional profit to be transferred to profit & Loss Account.

$$\text{Notional profit} \times \frac{2}{3} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

$$26,800 \times \frac{2}{3} \times \frac{4,80,000}{6,00,000} = ` 14,293$$

9. Compute a conservative estimate of profit on a contract (which has been 80% complete) from the following particulars. Illustrate at least 4 methods of computing the profit:

Particulars	Rs.
Total expenditure to date	**85,000**
Estimated further expenditure to complete the contract (including contigencies)	**17,000**
Contract price	**1,53,000**
Work certified	**1,00,000**
Work not certified	**8,500**
Cash received	**81,600**

Sol :

Calculation of Notional Profit

Particulars	Rs.	Rs.
Work certified		1,00,000
Uncertified		8,500
		1,08,500
Less: Total Expenditure		85,000
Notional Profit		23,500
Calculation of Estimated Profit		
Contract Price		1,53,000
Less: Expenditure incurred	85,000	
Estimated further expenditure	17,000	
		1,02,000
Estimated Profit		51,000

Methods of computing the profit to be transferred to P & L Account

1. Notional Profit $\times \frac{2}{3} \times$ Cash ratio $= 23,500 \times \frac{2}{3} \times \frac{81,600}{1,00,000}$

$= $ Rs. 12,784 (Approx.)

2. Notional Profit $\times \frac{\text{Work certified}}{\text{Contract price}} = 23,500 \times \frac{1,00,000}{1,53,000}$

$= $ Rs. 15,359 (Approx.)

3. Estimated Profit $\times \frac{\text{Work certified}}{\text{Contract price}} \times$ Cash ratio

$= 51,000 \times \frac{1,00,000}{1,53,000} \times \frac{81,600}{1,00,000}$

$= $ Rs. 27,200

4. Estimated Profit × $\frac{\text{Total cost to date}}{\text{Estimated total cost}}$ × Cash ratio

$$= 51,000 \times \frac{85,000}{1,02,000} \times \frac{81,600}{1,00,000}$$

$$= \text{Rs. } 34,680$$

10. Prepare (i) Contract A/c and (ii) Contractee A/c for the year 2018 and 2019 taking into consideration such profit for transfer to Profit & Loss A/c as you think proper.

Particulars	2018 (Rs.)	2019 (Rs.)
Materials used	6,00,000	1,68,000
Direct Wages	4,60,000	2,10,000
Direct Expenses	44,000	20,000
Indirect Expenses	12,000	2,800
Work Certified	15,00,000	20,00,000
Work Uncertified	16,000	- -
Materials at Site	10,000	14,000
Plant Issued	28,000	4,000
Cash Received from Contractee	12,00,000	20,00,000

The value of the Plant at the end of 2018 was Rs. 14,000 and at the end of 2019 Rs.10,000.

Sol : **(July-21)**

Dr. Contract A/c for the Year ended 31/12/2019 Cr.

Particulars	Amount (`)	Particulars		Amount (`)
To Materials	6,00,000	By Working in progress		
To Direct wages	4,60,000	Work certified	15,00,000	
To Direct expenses	44,000	Work uncertified	16,000	15,16,000
To Indirect expenses	12,000	By Materia at site		10,000
To Plant issued	28,000	By Plant at size		
To Notional profit c/d	3,96,000			
	15,40,000			15,40,000
To P & L A/c		By Notional profit b/d		3,96,000
$\left[\text{Notional profit} \times \frac{2}{5} \times \frac{\text{Cash received}}{\text{Work certified}}\right]$ $3,96,000 \times \frac{2}{3} \times \frac{12,00,000}{15,00,000}$	2,11,200			
To Reserves	1,84,800			
	3,96,000			3,96,000

Dr. Contract A/c for the Year ended 31/12/2019 Cr.

Particulars		Amount (`)	Particulars	Amount (`)
1/1/2016			1/1/2019	
To Working in progress A/c			By Contractee A/c	
Work certified	15,00,000		Contract price	20,00,000
Work uncertified	16,000		By material at site	14,000
	15,16,000		By Plant at site	10,000
(–) Reserves	1,84,800	13,31,200		
To Material at site		10,000		
To Plant at site		14,000		
To Plant Issued		4,000		
To Materials		1,68,000		
To Direct wages		2,10,000		
To Direct expenses		20,000		
To Indirect expenses		2,800		
To Profit				
(Transfer to P & L A/c)		2,64,000		
		20,24,000		20,24,000

Contractee A/c

Particulars	Amount (`)	Particulars	Amount (`)
31/12/2018		31/12/2018	
To Balance c/d	12,00,000	By Balance	12,00,000
31/12/2019		31/12/2019	
To Contract A/c	20,00,000	By Balance b/d	12,00,000
		By Bank	8,00,000
	20,00,000		20,00,000

11. Prepare Contract Account from the information given below:

Particulars	1988-89 Rs	1989-90 Rs
Materials	**3,00,000**	**84,000**
Wages	**2,30,000**	**1,05,000**
Expenses	**35,000**	**15,400**
Materials at end	**13,000**	**7,000**
Cash received	**6,00,000**	**10,00,000**
Certified Completion of Work	**75%**	**100%**

Sol : **(July-19)**

Dr. Contract A/c for 1988 – 89 Cr.

Particulars	Amount	Amount	Particulars	Amount	Amount
To Materials		3,00,000	By Work in progress		
To Wages		2,30,000	Certified		7,50,000
To Expenses		35,000	By Materials at the end		13,000
To Notional profit		1,98,000			
		7,63,000			7,63,000
To P & L A/c		1,05,600	By Notional profit		1,98,000
To Reserves		92,400			
		1,98,000			1,98,000

Dr. Contract A/c for 1989 – 90 Cr.

Particulars	Amount	Amount	Particulars	Amount	Amount
To Work in progress			By Reserves		92,400
Certified		7,50,000	By Materials at the end		7,000
To Materials					
b/f 1988 - 89	13,000				
To Purchased	84,000	97,000	By Contract price		10,00,000
To Wages		1,05,000			
To Expenses		15,400			
To P & L A/c (Profit)		1,32,000			
		10,99,400			10,99,400

Working Notes :

1. Calculation of certified work for 1988 - 89

   Contract price × % certified completion of work

   10,00,000 × 75% = ` 7,50,000

2. Calculation of amount of Notional Profit to be transferred to P & L A/c for 1988 - 89

   ▶ As certified work is 75% of contract price, the following formula is used

   $$\text{Notional profit} \times \frac{2}{3} \times \text{cash received work certified}$$

   $$198{,}000 \times \frac{2}{3} \times \frac{6{,}00{,}000}{7{,}50{,}000} = ` 1{,}05{,}600$$

12. From the following information prepare

a) The Contract Accounts

b) Contractee's Accounts

Materials sent to site	**85,349**
Labour engaged on site	**74,375**
Plant installed at cost	**15,000**
Direct Expenditures	**4,126**
Establishment charges	**3,167**
Materials returned to stores	**549**
Work Certified	**1,95,000**
Cost of work not certified	**4,500**
Material on hand, Dec. 31	**1,883**
Wages accrued on Dec. 31	**2,400**
Direct expenses accrued on 31st Dec.	**240**
Value of plant on Dec. 31st	**11,000**

The contract price has been agreed at ` 2,50,000. Cash has been received from the contractee amounting to ` 1.80,000.

Sol : **(Dec.-19)**

Dr. Contract A/c Cr.

Particulars		Amount	Particulars		Amount
To Materials sent to site		85,349	By Materials returned to Store		549
To wages	74,375		By Materials on Land		1,883
(+) Accrued	2,400	76,775	By plant		11,000
To plant		15,000	By work certified	1,95,000	
To Direct expenditure	4,126		Uncertified	4,500	1,99,500
(+) accured	240	4,366			
To establishment charges		3,167			
To Notional profit C/d		28,275			
		2,12,932			2,12,932
To P & L A/c			By Notional profit b/d		28, 275
$\left(28,275 \times \frac{2}{3} \times \frac{1,80,000}{1,95,000}\right)$		17,400			
To work in progress		10,875			
		28,275			28,275

Dr. **Contractee A/c** **Cr.**

Particulars	Amount	Particulars	Amount
To contract a/c	1,95,000	By Cash	1,80,000
		By balance c/d	15,000
	1,95,000		1,95,000

Calculation of work completed (%)

2,50,000 ... 100%

1,95,000 ... ?

$$\frac{1,95,000}{2,50,000} \times 100 = 78\%$$

13. The following was the expenditure on a contract of Rs. 12,00,000.

Material	**Rs. 2,40,000**
Wages	**Rs. 3,28,000**
Plant	**Rs. 40,000**
Other expenses	**Rs. 17,200**

Cash received Rs. 4,80,000 being 80% of work certified Material on hand Rs. 20,000, Plan had undergone 20% depreciation. Prepare Contract Account.

Sol : **(Dec.-18)**

Contract No –– Account of –– for the year ended

Particulars	`	Particulars	`
To Materials	2,40,000	By Work in progress	
To Wages	3,28,000	Certified work	6,00,000
		Uncertified work	–
To Plant (At cost)	40,000		
		By material on hand	20,000
To Other Expenses	17,200	By plant (closing value)	32,000
To Notional profit	26,800		
	6,52,000		6,52,000
To Profit & Loss A/c	14,293	By Notional profit	26,800
To Reserves	12,507		
	26,800		26,800

Working Notes

1. Calculation of certified work

If Certified Work is 80% – cash received ` 4,80,000

100 % – ?

$$\frac{4,80,000}{80} \times 100 = ` 6,00,000$$

2. Calculation of % of work completed

For ` 12,00,000 contract - work certified ` 6,00,000

100 ?

$$\frac{6,00,000}{12,00,000} \times 100 = 50\%$$

Hence the following formula is applied to transfer a portion of notional profit to be transfered to profit & Loss Account.

$$\text{Notional profit} \times \frac{2}{3} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

$$26,800 \times \frac{2}{3} \times \frac{4,80,000}{6,00,000} = ` 14,293$$

14. A Contractor's accounting year ends on 31st December every year. The following particulars relate to Contract No. 715, which remains incomplete on 31st December, 2017.

Particulars	`
Wages paid	1,62,000
Materials used	1,68,000
Plant sent to site	24,800
Direct expenses paid	9,200
Value of plant on 31.12.2017	20,000
Work certified by engineer	4,00,000
Cost of work not yet certified	6,600
Agreed contract price	5,00,000
Cash received	3,60,000
Wages accrued on 31.12.2017	3,120
Direct expenses accrued on 31.12.2017	640
Establishment charges applicable to work No. 715	27,360
Materials on hand on 31.12.2017	4,520

Prepare Contract Account crediting Profit & Loss A/c with two thirds of profit as reduced to the cash received.

Sol : **(Dec.-18(KU)**

Dr. Contract A/c Cr.

Particulars		Amount	Particular	Amount
To materials used		1,68,000	By plant in hand	20,000
To wages	1,62,000		By Materials on hand	4,520
(+) Accured	3,120	1,65,120	By work certified	4,00,000
To plant sent to site		24,800	By work on certified	6,600
To Direct expenses	9,200			
(+) Direct expenses	640	9,840		
To establishment charges		27,360		
To Notional profit c/d		36,000		
		4,31,120		4,31,120

15. The following was the expenditure on contract No. 646 for 45,00,000 which started in January 2016.

	`
Materials	**9,00,000**
Wages	**12,30,000**
Plant	**1,50,000**
Direct charges	**64,500**

Cash received on account upto 31st December, amounted to ` 18,00,000 being 80% of the work certified. The value of materials on hand at 31st. December is ` 75,000. Prepare contract account. 10% depreciation on plant was to be charged.

Sol : **(Dec.-18(MGU)**

Dr. Contract A/c Cr.

Particulars	Amount	Particulars	Amount
To Materials	9,00,000	By Work certified (18,00,000 × $\frac{100}{80}$)	22,50,000
To Wages	12,30,000	By Material on hand	75,000
To Plant	1,50,000	By plant (1, 50,000 × 10%)	1,35,000
To Direct Charges	64,500		
To Notional Profit	1,15,500		
	24,60,000		24,60,000
To P & L A/c	61,600	By Notional profit b/d	1,15,500
(1,15,500 × 2/3 × $\frac{80}{100}$)	53,900		
To balance c/d	1,15,000		1,15,500

5.1.5 Guidelines to Assess profit on incomplete Contracts

Q5. Explain the Guidelines to Assess profit on incomplete Contracts

Ans :

At the end of an accounting period it may be found that certain contracts have been completed while others are still in process and will be completed in the coming years. The total profit made on completed contracts may be safely taken to the credit of Profit and Loss Account. But the same cannot be done in case of incomplete contracts. These contracts are still in process, and there are possibilities of profits being turned into losses on account of heavy rise in prices of materials and labour and losses on account of other unforeseen contingencies. At the same time it does not also seem desirable to consider the profit only on completed contracts and ignore altogether incomplete ones because this may result in heavy fluctuation in the figure of profit from year to year. A year in which a large number of contracts have been completed will show an abnormally high figure of profit while reverse may be the case in the year in which a large number of contracts remain incomplete. Therefore, profit on incomplete contracts should be considered, of course, after providing adequate sums for meeting unknown contingencies.

(a) Profit should be considered in respect of work certified only, work uncertified should always be valued at cost.

(b) No profit should be taken into consideration of the value of work certified is less than ¼ of the contract price because in such a case it is not possible to foresee the future clearly.

(c) If the value of work certified is ¼ or more but less than ½ of the contract price, 1/3 of the profit disclosed, as reduced by the percentage of cash received from the contractee, should be taken to the Profit and Loss Account. The balance should be allowed to remain as a reserve.

(d) If the value of work certified is ½ or more or the contract price, 2/3 of the profit disclosed as reduced by the percentage of cash received from the contractee, should be taken to the Profit and Loss Account. The balance should be treated as a reserve.

(e) In case, the contract is very much near completion, the total cost of completing contract should be estimated if possible. The estimated total profit on the contract can be calculated by deducting the total cost from the contract price. The profit and loss account should be credited with the proportion of total estimated profit on cash basis, which the value of work certified bears to the total contract price.

5.2 PROCESS COSTING

5.2.1 Meaning, Features

Q6. What is process costing? Explain the characteristics of process costing.

(OR)

Explain the meaning of process costing.

Ans : **(July-19, Dec.-18)**

Meaning

In many industries, for manufacturing a product, the raw material has to pass through several distinct stages of manufacture in a predetermined sequence. Each such stage of manufacture is called a 'process'. The goods produced are identical and all factory processes are standardized. Method of cost ascertainment in such industries is known as process costing in which costs are compiled for each process by preparing a separate account of each process.

It should be noted that in certain industries either process costing or unit costing may be used, e.g., cement, sugar, steel, etc. It all depends upon the type of cost information that is required.

Characteristics

1. The production is continuous and the final product is the result of a sequence of processes.
2. Costs are accumulated by processes.
3. The products are standardized and homogeneous.
4. The cost per unit produced is the average cost which is calculated by dividing the total process cost by the number of units produced.
5. The finished product of each but last process becomes the input for the next process in sequence and that of the last process is transferred to the finished goods stock.
6. The sequence of operations or processes is specific and pre-determined.
7. Some loss of materials in processes (due to chemical action, evaporation, etc.) is unavoidable.
8. Processing of a raw materials may give rise to the production of several products. These several products produced from the same raw material may be termed as joint products or by products.

Q7. Explain advantages and disadvantages of process costing?

Ans : **(Dec.-18)**

Advantages

The following are some of the advantages of process costing :

(a) Process costs can be determined periodically at short intervals i.e., weekly even daily. This is not possible in job costing.

(b) The cost finding procedure is simple and less expensive than that in job costing.

(c) Managerial control may be employed by evaluation the performance of each process.

(d) Expenses may be allocated to process easily.

(e) Costs may be calculated accurately.

(f) As processes can be standardised price quotations may be made easily.

Disadvantages

The following are some of the disadvantages of process costing :

i) As costs are obtained at the end of the period, they are not of much use for effective control.

ii) The ascertainment of work in progress is difficult and introduces some inaccuracies.

iii) When more than one type of product is manufactured, a division of the cost elements is necessary and the computation of average cost is more different.

iv) Average costs are not always accurate and there is some times wide scope for errors.

Q8. What are the differences between process costing and job costing?

Ans :

A comparison of process and job costing methods will help in the better understanding of process costing system.

S.No.	Process Costing	S.No.	Job costing
1.	Costs are compiled process-wise and cost per unit is the average cost, i.e. the total cost of the process divided by the number of units produced.	1.	Costs are separately ascertained for each job, which is cost unit.
2.	Production is of standardised products and cost units are identical. from the customers.	2.	Production is of non-standard items with specifications and instructions
3.	Production is for stocks.	3.	Production is against orders from customers.
4.	Costs are computed at the end of a specific period.	4.	Costs are calculated when a job is completed.
5.	The cost of one process is transferred to the next process in the sequence.	5.	Cost of a job is not transferred to another job but to finished stock account.
6.	On account of continuous nature of production, work-in-progress in the beginning and end of the accounting period is a regular feature.	6.	There may or may not be work-in-progress in the beginning and end of the accounting period.
7.	Cost control is comparatively easier. This is because factory processes and products are standardised.	7.	Cost control is comparatively more difficult because each cost unit or job needs individual attention.

5.2.2 Preparation of Process Account

5.2.2.1 Normal and Abnormal Losses

Q9. Explain about various process account and discuss.

Ans :

Forms of Normal Losses

Normal loss maybe any one of the two forms,

(i) Normal Waste

According to Theodore Lang "Normal waste is the part of the basic raw material lost in processing which does not have any recovery value".

Accounting Treatment of Normal Waste

If there is any normal loss in a process then the costs incurred for that loss would be charged on the remaining production. Normal loss can be absorbed by the good production units which would increase the cost per unit.

Cost per unit of a product can be calculated with the help of the following formula,

$$\text{Cost per unit} = \frac{\text{Total cost of production}}{\text{Total output-Normal loss units}}$$

(ii) Normal Scrap

"Normal scrap is the residual material left in the manufacturing process which cannot be used in further process which have low recovery value".

Treatment of Normal Scrap

Incase of normal loss with a scrap value the cost per unit is calculated after deducting the scrap value from the total cost of production.

(iii) Abnormal Loss

The losses that may take place unexpectedly under abnormal conditions are called 'abnormal losses'. These losses are different from the normal losses, which are not easily predictable before the commencement of production. These losses can be controlled to some extent with the help of certain measures. The abnormal losses basically takes place due to breakdown of machinery, carelessness, accidents improper supply of labour, use of defective materials and so on. These losses are not recorded in the process account.

Treatment of Abnormal Losses with No Scrap Value

The abnormal losses with no scrap value are not included in the process account. They have to be recorded in a separate account or in profit and loss account.

Treatment of Abnormal Losses with a Scrap Value

Abnormal losses with a scrap or recovery value are recorded both in process account and abnormal loss account. Abnormal losses are calculated on the basis of the average unit cost of production. The abnormal losses are treated in the following manner,

(i) Determine the normal loss.

(ii) Determine the cost per unit in normal loss.

(iii) Multiply the cost per unit with the number of abnormal loss units to determine the abnormal loss value.

(iv) Record the value of abnormal loss and units once credit side of the process account.

(v) In the abnormal loss account shows the net loss and this balance must be transferred it to the profit and loss account.

$$\text{Abnormal Loss} = \frac{\text{Normal Cost of Normal Output}}{\text{Normal Output}} \times \text{Abnormal Loss(in units)}$$

Note:

Normal Cost of Normal Output = Debit Side Total Amount – Normal Loss Amount

Normal Output = Debit Side Total Units – Loss in Weights – Normal Loss(in units)

(iv) Abnormal Gain

$$\text{Abnormal Gain} = \frac{\text{Normal Cost of Normal Output}}{\text{Normal Output}} \times \text{Abnormal Gain(in units)}$$

Note:

Normal Cost of Normal Output = Debit Side Total Amount – Normal Loss Amount

Normal Output = Debit Side Total Units – Loss in Weights – Normal Loss(in units)

PROBLEMS ON PROCESS COSTING

16. Calculate the Cost of Abnormal Loss from the figures given below:

Normal Output = 9000 units

Actual Output = 8500 units

Normal Cost of Normal Output = Rs. 27,000.

Sol : **(July-19)**

Calculation of Abnormal loss

$$\frac{\text{Normal Cost of Normal output}}{\text{Normal output}} \times \text{Abnormal loss in units}$$

$$\frac{27000}{9{,}000 \text{ units}} \times 500 \text{ units} = ` 1{,}500$$

Working Notes :

Calculation of Abnormal loss units

Normal output – Actual output = Abnormal loss

9,000 units – 8,500 units = ` 500 units

17. The output of process X was 5000 units, normal loss allowed was 10% of input. Abnormal loss was 400 units. The following further information is obtained. Material Rs. 5 per unit, Overheads ` 6,700, Labour ` 8,000, Wastage realized ` 2.50 per unit Prepare Process X Account.

Sol : **(Dec. -19)**

Dr. Process 'X' A/c Cr.

Particulars	Units	Amount	Particulars	Units	Amount
To Materials	6,000 (6,000×5)	30,000	By Normal loss @ 2.50 per unit	600	1,500
To labour		8,000	By Abnormal loss @ 8.00 per unit	400	3,200
To overheads		6,700	By output @ 8.00	5,000	40,000
	6,000	44,700		6,000	44,700

Working Notes

i) Calculation of Input Units

Let Input = x units

Normal loss (10% of input) = $\frac{x}{10}$

$= \frac{9x}{10}$

$= \frac{9x}{10} = 5,400$

$9x = 5,400 \times 10$

$9x = \frac{54,000}{9}$

$x = 6,000$ units.

ii) Calculation of Cost Per Unit

$= \frac{\text{Total cost} - \text{Normal loss}}{\text{Total output} - \text{Normal loss units}}$

$= \frac{44,700 - 1,500}{6,000 - 600}$

$= \frac{43,200}{5,400} = 8$ `

18. In a process 1000 units introduced at a cost Rs. 20,000, other Expenses were Rs. 10,000, Wages Rs. 1020. Normal loss 10% and scrap is Rs. 5 per unit. Normal output 1000 units, Actual output is 700 units. Find out the Abnormal loss.

Sol : **(Dec.-18)**

Dr. Process Account Cr.

Particulars	Units	Amount	Particulars	Units	Amount
To Material	1,000	20,000	By Normal Loss	100	–
To wages		1,020	(10% of 1,000 units)		
			By Abnormal Loss	200	1,000
To other expenses		10,000	(@ 5/- p.u)		
			By output	700	30,020
	1,000	31,020		1,000	31,020

19. Calculate cost of abnormal loss from the figures given below:

Normal output	**18,000 Units**
Actual output	**17,000 units**
Normal cost of normal output	**` 54,000**

Sol : **(Dec.-18(MGU)**

Calculation of Abnormal loss

= Normal output – Actual output

18,000 – 17,000 = 1000 Units.

$$= \frac{54,000}{18,000} \times 1000 = 3000$$

20. Product B is obtained after it passes through three distinct processes. The following information is obtained from the accounts for the week ending 31st October 2015.

Items	Total (`)	Process-I (`)	Process-II (`)	Process-III (`)
Direct material	**7,542**	**2,600**	**1,980**	**2,962**
Direct wages	**9,000**	**2,000**	**3,000**	**4,000**
Production over head	**9,000**	**–**	**–**	**–**

1000 units at ` 3 each were introduced to Process I. There was no stock of material or work in Progress at the beginning or at the end of the period. The output of each process passes direct to the next process and finally to the finished stock. Production overhead is recovered on 100% of direct wages. The following additional data are obtained.

Process	Output in units	Normal loss%	Value of Scrap
I	**950**	**5%**	**2**
II	**840**	**10%**	**4**
III	**750**	**15%**	**5**

Prepare process cost accounts

Sol :

Dr. Process I A/c Cr.

Particulars	Units	Amount	Particulars	Units	Amount
To Inputs	1000	3,000	By Normal loss		
To Materials		2,600	1000 @ 5%	50 @ 2	100
To Wages		2,000	By Transfer to		
To Overheads		2,000	Process II [b/f]	950	9,500
	1000	9,600		1000	9,600

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

Particulars	Units	Amount	Particulars	Units	Amount
To Transfer from Process I	950	9,500	By Normal loss		
To Materials		1,980	(950 × 10%)	95 @ 4	380
To Wages		3,000	By Abnormal loss	15	300
To Overheads		3,000	By transfer to		
			Process II a/c [b/f]	840	16,800
	950	**17,480**		**950**	**17,480**

Units Introduced	950
(–) Normal loss	95
Normal output	855
(–) Actual output	840
Abnormal loss in units	15

$$\text{Abnormal loss (invalue)} = \text{Normal cost of } \frac{\text{Normal output}}{\text{Normal output}} \times \text{Abnormal loss}$$

$$= \frac{17480 - 380}{855} \times 15 = 300$$

Process III A/c

Particular	Units	Amount	Particular	Units	Amount
To Transfer from Process II	840	16,800	By Normal loss		
To Materials		2962	(840 × 15%)	126	630
To Wages		4,000	By Finished Stock	750	28,500
To Overheads		4,000			
To Abnormal gain [b/f]		1368			
	876	**29,130**		**876**	**29130**

Units Introduced	840
(–) Normal loss	126
Normal output	714
(–) Actual output	750
Abnormal gain	36

$$\text{Abnormal Gain (in value)} = \text{Normal cost of} = \frac{\text{Normal output}}{\text{Normal output}} \times \text{Abnormal Gain in(value)}$$

$$= \frac{27,762 - 630}{714} \times 36$$

$$= 1368$$

21. A Product passes through two distinct process A and B, and then to Finished Stock. The normal wastage of each process is as follows:

Process 'A': 3% of input introduced in the process

Process 'B': 5% of input introduced in the process

Wastage of process 'A' was sold at Re. 0.50 per unit and that of process B at Re. 1 per unit. 10,000 units were issued to process A' at a cost of Rs. 2 per unit. The other expenses were as follows:

Particulars	Process 'A' Rs.	Process 'B' Rs.
Sundry materials	2,000	3,000
Wages	10,000	16,000
Manufacturing expenses	2,100	2,375

Actual output

Process 'A' = 9,500 units;

Process 'B' = 9,100 units.

Prepare process accounts of A and B, Normal loss account, abnormal loss account and abnormal gain account.

Sol :

Dr. Process 'A' Account Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To units introduced	10,000	20,000	By normal loss	300	150
To sundry materials		2,000	[10,000 × 3%]		
To Wages		10,000	[300 × 0.50]		
To Manufacturing expenses		2,100	By abnormal loss	200	700
			By Transfer to process B	9,500	33,250
	10,000	34,100		10,000	34,100

Calculation of Abnormal Loss units value

In units	
Total units	10,000 units
(–) Normal loss units	300 units
	9,700 units
In Amount	
Total expenditure	34,100
(–) Normal loss units value	150
	39,950

For 9,700 units – 33,950

For 200 units – ?

$\frac{33,950 \times 200}{9,700}$ = Rs. 700.

Dr. **Process 'B' Account** **Cr.**

Particulars	Units	Rs.	Particulars	Units	Rs.
To Transfer for Process	9,500	33,250	By Abnormal Loss	475	475
To Sundry materials		3,000	[9,500 × 5%]		
To Wages		16,000	[475 × Rs.1]		
To Manufacturing expenses		2,375	By Transfer to process C	9,100	54,600
	9,500	54,625			
To Abnormal gain	75	450			
	9,575	55,075		9,575	55,075

Calculation of Abnormal gain units value

In units	
Total units (before gain)	9,500
(–) Normal loss units	475
	9,025
In Amount	
Total expenditure (before gain)	54,625
(–) Normal loss units value	475
	54,150

For 9,025 units – Rs. 54,150

For 75 units – ?

$\frac{54,150 \times 75}{9025}$ = Rs.450

22. A product passes through two distinct processes A and B, after B passes to finished product. Prepare the A and B process Accounts.

Particulars	Process A (Rs.)	Process B (Rs)
Material	**12,000**	**6,000**
Direct wages	**14,000**	**8,000**
Work expenses	**4,000**	**4,000**
Input to process A (units) 10,000 @ Rs. 1 per unit		
Normal loss	**5%**	**10%**
Output (Units)	**9,400**	**8,300**
Scrap value per 100 units	**8**	**10**

Sol :

Dr. **Process 'A' Account** **Cr.**

Particulars	Units	Rs.	Particulars	Units	Rs.
To units introduced	10,000	10,000	By normal loss	500	40
To materials		12,000	[10,000 × 5%]		
			[For 100 units - Rs. 8]		
			[For 500 units - ?]		
To Direct wages		14,000	By abnormal loss	100	421
To work expenses		4,000			
			By Transfer to		
			process B	9,400	39,539
	10,000	40,000		10,000	40,000

Calculation of Abnormal Loss units value

In units

Total units	10,000 units
(–) Normal loss units	500 units
	9,500 units

In Amount

Total expenditure	40,000
(–) Normal loss value	40
	39,960

For 9,500 units – 39,960

For 100 units – ?

$$\left[\frac{39,960 \times 100}{9,500} = \text{Rs. } 421\right]$$

Process B A/c

Particulars	Units	Rs.	Particulars	Units	Rs.
To Transfer from process A	9,400	39,539	By Normal loss (9400 × 10%)	940	94
To materials		6,000	For 100 units Rs. 10		
			for 940 units – ?		
To direct wages		8,000	By abnormal loss	160	1086
To work expenses		4,000	By Transfer to process c	8,300	56,359
	9,400	57,539		9,400	57,539

Calculation of Abnormal Loss Units Value

In units

Total units	9,400
(–) Normal loss units	940
	8,460

In Amount

Total expenditure	57,539
(–) Normal loss value	94
	57,445

For 8,460 units – 57,445

For 160 units – ?

$$\left[\frac{57,445 \times 160}{8,460} = \text{Rs. } 1086\right]$$

23. A product passes through two distinct processes. A and B and then to finished stock. The output of process A passes direct to B and that of B passes to finished product. From the following information your are required to prepare accounts.

Particulars	Process 'A' (Rs.)	Process 'B' (Rs.)
Materials consumed	**12,000**	**6,000**
Direct labour	**14,000**	**8,000**
Manufacturing expenses	**4,000**	**4,000**
Input to Process 'A' (units)	**10,000**	
Input to Process 'A' (Value)	**10,000**	
Output (Units)	**9,400**	**8,300**
Normal loss (% of output)	**5%**	**10%**
Value of normal loss (per 100 units)	**8**	**10**
No opening or closing stock is held.		

Sol :

Dr. Process A Account Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To units introduced	10,000	10,000	By normal loss	500	40
To materials consumed	–	12,000	[For 100 units - Rs. 8 / For 500 units - ?]		
To direct labour		14,000	$\left[\frac{8 \times 500}{100}\right]$		
To manufacturing expenses	–	4,000	By Abnormal Loss	100	421
			By Transfer to process 'B'	9,400	39,539
	10,000	40,000		10,000	40,000

In units

Total Units = 10,000

(–) Normal Loss Units = 500

9,500

In value

Total expenditure = 40,000

(–) Normal Loss Value = 40

39,960

For 9,500 units – Rs. 39,960

For 100 units – ?

$\left[\frac{39,960 \times 100}{9,500} = \text{Rs. } 421\right]$

Dr. Process B Account Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To transfer from process - A	9,400	39,539	By normal loss (9,400 × 10%)	940	94
To materials consumed	–	6,000	[For 100 units - Rs. 10 / For 940 units - ?]		
To direct labour		8,000	By Abnormal Loss	160	1086
To manufacturing expenses	–	4,000	By Transfer to finished stock	8,300	56,359
	9,400	57,539		9,400	57,539

In units

Total Units	=	9,400
(–) Normal Loss Units	=	940
		8,460

In value

Total expenditure	=	57,539
(–) Normal Loss Value	=	94
		57,445

For 8,460 units – Rs. 57,445

For 160 units – ?

$$\left[\frac{57,445 \times 160}{8,460} = \text{Rs. } 1086\right]$$

24. Make out the necessary Accounts from the following details:-

Particulars	Process A	Process B
Materials	**Rs. 60,000**	**Rs. 6,000**
Labour	**Rs. 20,000**	**Rs. 24,000**
Overheads	**Rs. 14,000**	**Rs. 17,200**
Inputs (Units)	**20,000**	**17,500**
Normal Loss	**10%**	**4%**
Sale Value of Wastage per Unit	**Rs. 1**	**Rs. 2**

There was no Opening or Closing Stock or Work in Progress Final Output from Process 'B' was 17,000 Units.

Sol : **(July-21)**

Dr. Process 'A' Account Cr.

Particulars	Units	Amount (`)	Particulars	Units	Amount (`)
To Materials	20,000	60,000	By Normal loss (10% of Input @ 1 Rs. per unit)	2,000	2,000
To Labour		20,000			
To Overheads		14,000	By Abnormal loss	500	2,555*
			By Output (Transfer to process 'B' A/c	17,500	89,445
	20,000	94,000		20,000	94,000

Dr. Process 'B' Account Cr.

Particulars	Units	Amount (`)	Particulars	Units	Amount (`)
To Input (Transfer from process 'A' A/c)	17,500	89,445	By Normal Loss A/c (4% of Input @ 2 P.U)	700	1,400
To Materials		6,000			
To Labour		24,000	By Finished stock A/c	17,000	1,38,855
To Overheads		17,200			
To Abnormal gain	200	*1,610			
	17,700	1,38,255		17,700	1,38,255

Working Notes

1. Calculation of Abnormal Loss value

$$\frac{\text{Cost incurred} - \text{Amount realised from sale of normal loss}}{\text{Normal output}} \times \text{Abnormal loss units}$$

$$\frac{94000 - 2000}{20,000 \text{ units} - 2000 \text{ units}} \times 500 \text{ units} = ` 2,555$$

2. Calculation of Abnormal gain value

$$\frac{\text{Cost incurred} - \text{Amount realised from sales of normal loss}}{\text{Normal output}} \times \text{Abnormal gain units}$$

$$\frac{1,36,645 - 1,400}{17,500 - 700} \times 200 \text{ units} = ` 1,610$$

25. Prepare the Process Accounts A and B from the following details.

Particulars	Process - A	Process - B
Materials	**30,000**	**3,000**
Labour	**10,000**	**12,000**
Overheads	**7,000**	**8,600**
Input (units)	**20,000**	**17,500**
Normal loss	**10%**	**4%**
Sale Value of Wastage per unit	**1**	**2**
There was no Opening and Closing Stock.		
Final output from Process - B was 17,000 units.		

Sol : **(July-19)**

Dr. Process A A/c Cr.

Particulars	Units	Amount	Particulars	Units	Amount
To Materials	20,000	30,000	By Normal loss		
To Labour		10,000	(10% of 20,000 units @1 P.U)	2,000	2,000
To overheads		7,000	By Abnormal loss	500	1,250
			By Output (Transferred to	17,500	43,750
			process B A/c)		
	20,000	47,000		20,000	47,000

Calculation of Abnormal Loss Value

$$\frac{\text{Normal Cost of Normal output}}{\text{Normal output}} \times \text{Abnormal loss in units}$$

$$\frac{47,000 - 2,000}{18,000 \text{ units}} \times 500 \text{ units}$$

$$\frac{45000}{18,000 \text{ units}} \times 500 \text{ units} = ` 1,250$$

Dr. Process B A/c Cr.

Particulars	Units	Amount	Particulars	Units	Amount
To Input (Transfer	17,500	43,750	By Normal loss (4% of	700	1,400
from process A A/c)			17,500 units @ ` 2/- P.U)		
To Materials		3,000			
To Labour		12,000			
To overheads		8,600			
To Abnormal gain	200	785	By Finished stock	17,000	66,735
	17,700	68,135		17,700	68,135

Calculation of Abnormal Gain Value

$$\frac{\text{Normal Cost of Normal output}}{\text{Normal output}} \times \text{Abnormal gain in units.}$$

$$\frac{67350 - 1,400}{16,800 \text{ units}} \times 200 \text{ units}$$

$$\frac{65950}{16,800 \text{ units}} \times 200 \text{ units} = ` 785$$

26. Product X is obtained after it passes through 3 district processes. You are required to prepare process accounts from the following information.

Particulars	Total	Process - I	Process - II	Process - III
Material	15,084	5,200	3,960	5,924
Direct Wages	18,000	4,000	6,000	8,000
Production Overheads	18,000	-	-	-

1,000 units @ ` 6 per unit were introduced in Process-I. Production Overheads are to be distributed at 100% on Direct Wages.

	Actual Output	Normal Loss	Value of Scrap per unit
Process - I	950	5%	` 4.00
Process - II	840	10%	` 8.00
Process - III	750	15%	` 10.00

Sol : **(Dec.-19)**

Dr. Process I Account Cr.

Particulars	Units	Amount	Particulars	Units	Amount
To units introduced @ 6 ` per unit	1,000	6,000	By Normal loss (5% of 1,000)	50	200
To Materials		5,200	By process II	950	19,000
To Direct wages		4,000			
To Production overheads		4,000			
	1,000	19,200		1,000	19,200

Calculation of Normal output

Actual Input	1000
(–) Normal loss	50
Normal output	950

Dr. Process II Account Cr.

Particulars	Units	Amount	Particular	Units	Amount
To process-I A/c	950	19,000	By Normal loss	95	760
To Materials		5,200	(10% of 950)		
To wages		6,000	By abnormal loss	15	600
To Production overheads		6,000	By process III	840	33,600
	950	34,960		950	34,960

Calculation of Abnormal loss (`) = $\frac{34,960 - 760}{855} \times 15 = 600$

Dr. **Process III Account** **Cr.**

Particulars	Units	Amount	Particular	Units	Amount
To process-II	840	33,600	By Normal loss	126	1,260
To Materials		5,924	(15% of 840)		
To Direct Wages		8,000	By finished stock	750	57,000
To production overheads		8,000			
To abnormal gain	36	2736		876	58,260
	876	58,260		876	58,260

Abnormal Gain = $\frac{55,524 - 1260}{840 - 126} \times 36$ = 2,736 Units

27. The product of a Manufacturing concern passes through two process A and B then to Finished product.

Each process normally has 5% loss in weight and 10% is scrap which from A and B realises Rs. 80 per kg and Rs. 200 per kg. respectively.

Following are the figures relating to two process :

Particulars	Process - A	Process - B
Material in kgs	**1000**	**70**
Cost of the Material (Rs) per kg	**125**	**200**
Wages (Rs.)	**28000**	**10,000**
Expenses (Rs.)	**8000**	**5250**
Output in kgs	**830**	**780**

Prepare process accounts showing Cost per kg of each process.

Sol : **(Dec.-18)**

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

Particulars	Units	Amount	Particulars	Units	Amount
To Material	1,000	1,25,000	By Normal Loss A/c	50	–
(@ ` 125/- per kg)			(5% of 1,000 kgs)		
To wages		28,000	By Scrap (10% of 1,000 kg	100	8,000
			@ 80 per kg		
To Expenses		8,000	By Abnormal Loss	20	3,788
			By output		
			(Transfer to process - B A/c)	830	1,49,212
	1,000	1,61,000		1,000	1,61,000

1. Calculation of Abnormal Loss

$$\frac{\text{Normal cost of normal output}}{\text{Normal output}} \times \text{Kgs of Abnormal Loss}$$

$$\frac{1,61,000}{850 \text{ Kgs}} \times 20 \text{ Kgs} = ` 3,788$$

2. Calculation of cost per kg

$$\frac{\text{Cost}}{\text{Output}} \quad \frac{`1,49,212}{830 \text{ Kgs}} = ` 360 \text{ Per Kg}$$

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

Particulars	Units	Amount	Particulars	Units	Amount
To Input (Transfer from			By Normal Loss		
Process A A/c	830	1,49,212	(5% of 830 + 70 = 900 kgs)	45	–
To Materials	70	14,000	By Scrap (10% of 900 kgs	90	18,000
(@ 200 /- per kg)			@ 200 per kg)		
To Wages		10,000			
To Expenses		5,250			
To Abnormal Gain	15	3,500	By Finished stock	780	1,63,962
	915	1,81,962		915	1,81,962

1. Calculation of Abnormal Gain

$$\frac{\text{Normal Cost of Normal output}}{\text{Normal output}} \times \text{Kgs of Abnormal Gain}$$

$$\frac{1,78,462}{765 \text{ Kgs}} \times 15 \text{ Kgs} = ` 3500$$

2. Calculation of cost per kg

$$\frac{\text{Cost}}{\text{Output}} \quad \frac{`1,63,962}{780 \text{ Kgs}} = ` 210.20 \text{ Per kg}$$

28. A product passes through three stages of production and the product of each stage becomes the raw materials of the next stage. Further raw materials are also added at each stage. During March 2014, 2000 units of finish product were produced with the following expenditure.

Particulars	Stage-A	Stage-B	Stage-C
Materials	20,000	16,000	8,000
Labour	16,000	24,000	12,000
Direct expenses	1,200	2,000	800

Indirect expenses amounted to ` 2,600. It is to be apportioned on the basis of labour. Main raw issued to stage (besides above) was worth ` 12,000. Prepare the process cost accounts.

Sol : **(Dec.-18(MGU)**

Dr. Stage 'A' Account Cr.

Particulars	Cost Per Unit	Total Cost	Particulars	Cost Per Unit	Total Cost
To Raw materials	6.00	12,000	By stage B A/c	25.00	50,00
To Materials	10.00	20,000			
To Labour	8.00	16,000			
To Direct expenses	0.60	1,200			
To Indirect expenses	0.40	800			
16,000/52,000×2,600					
	25.00	50,000		25.00	50,000

Dr. Stage 'B' Account Cr.

Particulars	Cost Per Unit (`)	Total Cost (`)	Particulars	Cost Per Unit (`)	Total Cost (`)
To Transfer from stage A	25.00	50,000	By stage C A/s	46.60	93,200
To Materials	8.00	16,000			
To Labour	12.00	24,000			
To Direct expenses	1.00	2,000			
To Indirect expenses	0.60	1,200			
$\frac{24,000}{52,000} \times 2,600$					
	46.60	93,200		46.60	93,200

Dr. **Stage 'C' Account** **Cr.**

Particulars	Cost Per Unit (`)	Total Cost (`)	Particulars	Cost Per Unit (`)	Total Cost (`)
To Transfer from stage B	46.50	93,200	By Finished stock A/c	57.30	1,14,600
To Materials	4.00	8,000			
To Labour	6.00	12,000			
To Direct expenses	0.40	800			
To Indirect expenses	0.30	600			
$\frac{12000}{52000} \times 2600$					
	57.30	1,14,600		57.30	1,14,600

Exercise Problems

1. Normal cost of Normal output ` 1,00,000
   Normal output 5,200 units
   Abnormal loss 200 units
   Find out the value of abnormal loss.

   [Ans : 200 units valued ` 3,846.15]

2. Calculate cost of abnormal loss from the figures given below. Normal output 9,000 units. Actual output 8,500 units
   Normal Cost of normal output ` 27,000

   [Ans : Abnormal Loss 500 units valued at ` 1,500]

3. Product X is produced after three distinct processes. The following information is obtained from the accounts of a period.

Items	Total `	Process I `	Process II `	Process III `
Direct Materials	2,200	1,800	300	100
Direct Wages	400	100	200	100
Direct Expenses	500	300	-	200

   Production overhead incurred is ` 800 and is recovered on 200% of direct wages. Production during the period was 100 kgs. There was no opening or closing stocks. Prepare process cost accounts.

   [Ans: Cost per Kg. Process I ` 24; Process II ` 33; Process III ` 39]

4. A product passes through three stages of production and the product of each stage becomes the raw material for the next stage. Further raw materials are also added at each stage. During March 1983, 2,000 units of finished product were produced with the following expenditure.

	Stage A	Stage B	Stage C
Materials	20,000	16,000	8,000
Labour	16,000	24,000	12,000
Direct expenses	1,200	2,000	800

   Indirect expenses amounted to ` 2,600. It is to be apportioned on the basis of labour. Main raw materials issued to stage to stage A (besides above) was worth ` 12,000. Prepare the process cost account showing the cost per unit at each stage and the total cost of finished product at the final stage.

   [Ans: Transfer to stage B ` 50,000; Stage C ` 93,200 and to finished Stock account ` 1,14,600]

5. A particular brand of phenyle passed through three important processes. During the month of June 1983, 600 gross of bottles were produced. The cost books show the following information.

	Process I	Process II	Process III
Materials	5,000	3,000	2,000
Labour	3,000	2,500	1,500
Direct expenses	1,200	800	500
Cost of bottles	Nil	2,300	Nil
Cost of corks	Nil	Nil	300

The indirect expenses for the period were ` 1,400. They by-product of process **II** was sold for ` 200 and the residue of process III were sold for ` 120.

Prepare the account in respect of each process showing its cost and cost of production of finished product per gross of bottles.

[Ans: Transfer to Process II ` 9,800; III ` 18,700; Finished stock account ` 23,180]

6. A Foundry engages in the production of castings. The processes involved are :

(a) Foundry work

(b) Turning

(c) Drilling

(d) Inspection, and

(e) Packing

Foundry produces 1 kg. (net) castings at a cost of ` 3.50 per unit.

	`
Cost of turning	1.75
Cost of drilling	1.25

Cost of inspection (at all stages) and packing per unit on final net 0.50 Inspection rejects 2 castings per 100 on completion of turning and 3 castings on completion of drilling process. The rejected castings after turning are sold for `1.80 per unit and those after drilling @ `1.75 per unit. Credit for sale of scrappings is ` 2.50 per hundred castings put through. Assuming that 10,000 castings are put through each month, prepare a process cost sheet indicating the final output and net cost per unit.

[Ans : Cost per unit ` 7.193]

7. Calculate the amount of profit to be transferred to profit and loss account from the following particulars relating to a contract:- Contract Price ` 16,00,000; Cash received from the Contractee (being 70% of work certified) ` 4,90,000; Cost of work not yet certified ` 60,000; Total expenditure incurred on the contract ` 6,40,000.

[Ans: Notional Profit ` 1,20,000; Profit to be transferred to profit and loss account ` 28,000]

8. Calculate the amount of profit transferable to P & L a/c from the following:- Contract Price ` 25 Lakhs; Cash received from the Contractee (being 80% of work certified) ` 12 lakhs; Uncertified Work ` 50,000; Actual expenditure incurred on the contract ` 10 Lakhs (including closing stock of materials at contract site). Closing stock at contract site ` 40,000.

[Ans: Notional Profit ` 5,90,000; profit to be transferred to profit and loss account ` 3,14,667]

9. Prepare a Contract account from the following particulars:

Particulars	`
Materials issued from stores	2,00,000
Materials purchased	1,60,000
Plant installed at site	50,000
Establishment charges	40,000
Materials returned to stores	10,000
Wages paid	1,40,000
Wages accrued	20,000
Direct Expenses	6,000
Indirect Expenses	14,000
Materials transferred to another account	30,000
Materials on hand	40,000
Depreciation on Plant	20%
Contract Price	10,00,000
Work Certified	5,00,000
Cost of work not yet certified	50,000
Cash received from the Contractee	4,00,000

[Ans : Notional Profit ` 40,000, Amount transferred to Profit & Loss Accounts `21,333]

10. APWD Contractor's accounting year ends on 31st December every year. The following particulars relate to contract No.714, which remains incomplete on 31st December 1975.

Particulars	`
Wages Paid	81,000
Materials used	84,000
Plant sent to site	12,400
Direct expenses paid	4,600
Value of plant on 31-12-1975	10,000
Work Certified by Engineer	2,00,000
Cost of work not yet Certified	3,300
Agreed contract price	2,50,000
Cash received	1,80,000
Wages accrued on 31-12-1975	1,560
Direct expenses accrued on 31-12-1975	320
Establishment charges applicable to work No. 714	13,680
Materials on hand on 31-12-1975	2,260

Prepare contract account crediting P & L A/c with two thirds of profit as reduced to the cash received.

[Ans: Notional Profit ` 18,000, Profit credited to P & L A/c ` 10,800]

11. A building contractor having undertaken construction work at contract price of ? 6,00,000 began execution of the work on 1st January, 1980. The following are the particulars of the contract up to 31st December, 1980.

Particulars	`
Materials	1,20,000
Wages	1,38,000
Plant	30,000
Establishment Charges	11,100

Cash received on account up to 31st December, 1980 amounted to ` 2,70,000 representing 80% of the work certified, the remaining 20 percent being retained until completion. The value of materials on hand was ` 8,100 and the work finished but not certified was ` 7,500. Prepare the Contract A/c assuming depreciation on plant at 10% p.a. and state the proportion of profit the contractor would be justified in talking to the credit of the P & L A/c. Also show how the work in progress would appear in the Balance Sheet as on 31st December, 1980.

[Ans: Notional Profit ` 81,000, Profit credited to P & L A/c, ` 43,200]

Short Question and Answers

1. Contract costing.

Ans :

Contract costing is that form of specific order costing which applies where the work is undertaken to customer's requirements and each order is of long duration as compared to job costing. The work is generally of constructional nature. A construction contract is a contract for the construction of an asset or of a combination of assets which together constitute a single substantial project. This covers various activities as construction of plants (including site preparation), bridges, roads, dams, ships, buildings, complex pieces of equipment, production of motion pictures etc. That is why this method is used by builders, civil engineering contractors, constructional and mechanical engineering firms etc. These contracts are negotiated in a number of ways.

2. Advantages of Contract Costing

Ans :

i) Recover of Losses: The possibility of incurring losses are nil, as all the costs are recovered from the contractee.

ii) Uninterrupted of Work: No delays will be involved in the completion of work.

iii) Benefits of Cost Plus Contract Method: This method mostly beneficial if a contract's value is very high.

iv) Simplification: Working with quotations and tenders are simple.

v) Fixed Percentage of Profit: The contractor receives assumed fixed percentage of profit.

vi) Social Justice: Both the contractor and the contractee gets the benefits of social justice.

vii) Effective Control: The contract's performance can be controlled effectively by contractee by possessing retention amount.

3. Process costing.

Ans :

In many industries, for manufacturing a product, the raw material has to pass through several distinct stages of manufacture in a pre-determined sequence. Each such stage of manufacture is called a 'process'. The goods produced are identical and all factory processes are standardised. Method of cost ascertainment in such industries is known as process costing in which costs are compiled for each process by preparing a separate account of each process.

It should be noted that in certain industries either process costing or unit costing may be used, e.g., cement, sugar, steel, etc. It all depends upon the type of cost information that is required.

4. Characteristics of Process Costing

Ans :

(i) The production is continuous and the final product is the result of a sequence of processes.

(ii) Costs are accumulated by processes.

(iii) The products are standardised and homogeneous.

(iv) The cost per unit produced is the average cost which is calculated by dividing the total process cost by the number of units produced.

(v) The finished product of each but last process becomes the input for the next process in sequence and that of the last process is transferred to the finished goods stock.

5. Advantages of Process Costing

Ans :

(a) Process costs can be determined periodically at short intervals i.e., weekly even daily. This is not possible in job costing.

(b) The cost finding procedure is simple and less expensive than that in job costing.

(c) Managerial control may be employed by evaluation the performance of each process.

(d) Expenses may be allocated to process easily.

(e) Costs may be calculated accurately.

6. Disadvantages Process Costing

Ans :

i) As costs are obtained at the end of the period, they are not of much use for effective control.

ii) The ascertainment of work in progress is difficult and introduces some inaccuracies.

iii) When more than one type of product is manufactured, a division of the cost elements is necessary and the computation of average cost is more different.

7. Abnormal Loss

Ans :

The losses that may take place unexpectedly under abnormal conditions are called 'abnormal losses'. These losses are different from the normal losses, which are not easily predictable before the commencement of production. These losses can be controlled to some extent with the help of certain measures. The abnormal losses basically takes place due to breakdown of machinery, carelessness, accidents improper supply of labour, use of defective materials and so on. These losses are not recorded in the process account.

8. Materials

Ans :

Materials purchased directly or supplied from the store or transferred from other contracts will appear on the debit side. Materials returned to store will appear on the credit side. Amount received from the sale of surplus materials will appear on the credit side, any profit or loss arising from the sale will be transferred to the Profit and Loss Account. Materials stolen or destroyed by fire will be transferred to the Profit and Loss Account. In case any compensation is receivable from the insurance company for loss of materials, the amount due from insurance company is shown in the Balance Sheet. The loss which is not

compensated is debited to Profit & Loss Account. Materials in hand at the end of the year will appear on the credit side. Sometimes materials are transferred from one contract to another contract. Contract receiving the materials is debited and the contract giving up the materials is credited. Normal wastage incurred in stores and materials should be charged to contracts by inflating the rates at which materials are priced out. Stores used in the manufacture of tools should be charged to Works Expenses A/c. Sometimes, it happens that the contractee under the terms of the contract, supplies some materials which do not affect the contract price. The value of such material should not be debited to Contract Account but a note will have to be kept to account for the quantity received and issued on a separate memorandum record.

9. Explain about "Idle Time".

Ans :

Idle time represents the wages paid for the time Lost during which the worker does not work. During Idle time, the workers remain idle but full wages are paid to them. Idle time is of 2 types.

(i) Normal Idle time

(ii) Abnormal Idle time

(i) Normal Idle Time

It results usually from unavoidable causes. Examples of normal idle time include time taken from factory gate to the place of work, time taken for personal needs and tea breaks, time taken for tool setting adjustment of machines etc.

(ii) Abnormal Idle Time

Abnormal Idle time arises due to avoidable causes. Abnormal idle time may be caused due to the following.

(a) Idle time due to machine break down or power cuts.

(b) Waiting for work or tools or raw material.

(c) Time lost due to strikes or lock outs in the factory.

10. What do you mean by Notional Profit ?

Ans :

Many contracts take two or more years for completion. The entire profit shown by contract account in such a case can't be transfered to profit and loss account as the possibility of loss in the succeeding years can't be ruled out. Hence, the profit shown by the contract is termed as "National Profit".

Notional Profit is ascertained by deducting the expenditure incurred on the contract from the total of work certified & uncertified.

11. Abnormal Gain.

Ans :

$$\text{Abnormal Gain} = \frac{\text{Normal Cost of Normal Output}}{\text{Normal Output}} \times \text{Abnormal Gain(in units)}$$

Note:

Normal Cost of Normal Output = Debit Side Total Amount – Normal Loss Amount

Normal Output = Debit Side Total Units – Loss in Weights – Normal Loss(in units)

Choose the Correct Answer

1. The first step in process costing system is to [a]
   (a) Summarize flow of output (b) Compute output in units
   (c) Summarize total costs (d) Compute cost for each equivalent unit
2. The costs that are incurred in last department, where the product has been processed and will be carried to next department for further processing are called [b]
   (a) Partial work costs (b) Transferred-in costs
   (c) Transferred-out costs (d) Weighted average costs
3. 'Contract costing' is used in which of the following [a]
   (a) Ship building (b) Textile industry
   (c) Paper manufacturing (d) Nursing homes
4. Process costing is suitable for_____. [b]
   (a) Hospitals (b) Oil refining firms
   (c) Transport firms (d) Brick laying firms
5. The sum of value of work certified and uncertified appearing in the Contract Account is called _____ [d]
   (a) Work done (b) Work in Process
   (c) Work Completed (d) Work in Progress
6. Machine hour rate is obtained by dividing the total running expenses of a machine during a particular period by the _____ [d]
   (a) Wages (b) Number of products produced
   (c) Number of workers (d) Number of hours
7. Works cost is a total of _____ [b]
   (a) Indirect material, Indirect labour
   (b) Direct material, direct labour, direct or chargeable expenses and works expenses
   (c) Direct material, direct labour
   (d) Indirect material, Indirect labour, Indirect expenses
8. When the completion stage of the contract is more than half, the profit to be credited to Profit and Loss account will be equal to _____ [c]
   (a) 1/3rd of Notional Profit x cash received Work certified
   (b) ½ of Notional Profit x cash received Work certified
   (c) 2/3rd of Notional profit x cash received Work certified
   (d) full Notional Profit.
9. The loss incurred on an incomplete contract is transferred to _____ account. [b]
   (a) Costing profit and loss account (b) Profit and loss account
   (c) Trading account (d) Deferred to next year
10. When the completion stage of a contract is less than ¼, the total expenditure on the contract is transferred to _____ account [b]
   (a) Work-in-Progress (b) Profit and loss account
   (c) Miscellaneous account (d) None of these

Fill in the blanks

1. _____ Costing is used in Industries where materials pass through two or more process in such a way that output of one process is input for the next process.
2. Loss inherent in the production process is _____
3. Excess of actual loss over normal loss is _____
4. Excess of actual output over normal output is _____
5. _____ process loss should be transferred to costing P and L A/c.
6. Contract costing is that form of _____ costing under which each contract is treated as cost unit.
7. _____ is that portion of the work completed which has been approved by contractees architect.
8. _____ is that portion of the work completed which has not been certified by the contractees architect.
9. In contract costing, the most of the items of cost are _____.
10. _____ in a contract provides that the contract price would be suitably enhanced on occurrence of a specified contingency.

ANSWERS

1. Process
2. Normal Loss
3. Abnormal Loss
4. Abnormal gain
5. Abnormal
6. Specific Order
7. Work Certified
8. Work uncertified
9. Direct
10. Escalation clause

FACULTY OF COMMERCE

B.Com III Year V-Semester (CBCS) Examination

(Common Paper for General / Computers / Computer Applications / Advertising / Foreign Trade and Tax Procedure Courses)

July - 2021

COST ACCOUNTING

Time : 3 Hours] **[Max. Marks : 80**

PART – A (4 × 5 = 20 Marks)

Note: Answer any **FOUR** questions

ANSWERS

1. What is meant by Cost Centre? **(Unit-I, SQA-8)**
2. What are the limitations of Cost Accounting? **(Unit-I, SQA-7)**
3. ABC Analysis **(Unit-II, SQA-5)**
4. Annual Consumption 1200 Units, Ordering Cost of Rs.24 per order, Price per Unit Rs.20 and Carrying Cost 20%. Calculate E.O.Q. **(Unit-II, Prob.8)**
5. A worker under the Halsey method of remuneration has a day rate of Rs.24 per week of 48 hours, plus a cost of Living Allowance of 20 paise per hour worked. He is given 8 hours task to perform. Which he complete in 6 hours. He is allowed 30% of time saved as Premium Bonus. What would be his Total and Hourly Rate of Earning? **(Unit-III, Prob.8)**
6. Classification of Overheads. **(Unit-III, SQA-16)**
7. Ascertain Profit from the following :
   Cost of Production Rs.88,000 for 22,000 Units, Selling Expenses Rs. 0.40 per Unit, Sales Rs.1,08,000 for 18,000 Units. **(Unit-IV, Prob.1)**
8. Contract Price Rs.25 Lakhs, Cash Received from the Contractee (being 80% of Work Certified) Rs.12 Lakhs, Uncertified Work Rs.50,000. Actual Expenditure incurred on the Contract Rs.10 Lakhs (including Closing Stock of Materials at Contract Site). Closing Stock at Contract Site Rs.40,000. Calculate the amount of Profit transfer to Profit and Loss Account from the above information. **(Unit-V, Prob.1)**

PART – B (4 × 15 = 60 Marks)

Note: Answer any **FOUR** questions

9. Explain the nature and scope of the Cost Accounting. **(Unit-I, Q.No.2,5)**
10. Explain the essentials of a Good Cost Accounting System. **(Unit-I, Q.No.8)**

11. The following transactions occur in the Purchases and issue of materials

	Purchases	Issues
March 1st	200 Units (5) Rs. 10 each	March 20th 160 Units
March 4th	50 Units @ Rs. 10.50 each	March 27th 160Units
March 15th	100 Units (5) Rs.11.00 each	March 30th 100Units
March 22nd	100 Units @ Rs.11.00 each	
March 26th	100 Units @ Rs.11.50 each	

Prepare the Stock Account showing the Balance on March 31st by using LIFO method. **(Unit-II, Prob.19)**

12. Prepare the Stores Ledger from the following transaction adopting the Weighted Average Method of Pricing out issues.
1st July Opening Balance 100 Units @ Rs. 6 per Unit
5th July Purchased 96 Units @ Rs.8 per Unit
7th July Issued out to Production 4 Units
9th July Issued out 40 Units to Production
19th July Purchased 152 Units @ 6 per Unit
25th July Received back into Stores 38 Units out of 40 Units issued on 9th July
28th July Issued to Production 20 Units. **(Unit-II, Prob.24)**

13. From the following particulars, calculate the earnings of P and Q on the Straight Piece Rate basis and Taylor's Differential Piece Rate System. Standard Production is 16 Units per hour and normal time rate 0.80 paise per hour. In a 9 hour day 'P' produced 108 Units, Q produced 150 Units. Differentiate to be applied (i) 80% of piece rate at below standard and (ii) 120% of piece rate at or above standard. **(Unit-III, Prob.18)**

14. Compute the Machine Hour Rate from the following data.
Cost of the Machine Rs.2,00,000, Installation Charges Rs.20,000, Estimated Scrap Value after Expiry of its life of 15 years Rs. 10,000. Rent and Rates of the Shop per month Rs.400, General Lighting Rs.600 p.m. for the shop. Shop Supervisor's Salary Rs.1,200 p.m., Insurance Premium for the Machine Rs.1,920 p.a., Estimated Repairs and Maintenance Rs.2,000 p.a., Power Consumption of the Machine: 10 Units per hour, at Rs.40 per 100 Units. Estimated working hours of the Machine per year (including set up time of 200 hours): 2,200. The machine occupies 1/4 of the total floor area of the shop. The Supervisor of the shop devotes 1 /5th of his time for Supervising the Machine. **(Unit-III, Prob.32)**

15. In a factory two types of articles are produced viz., A and B. From the following particulars prepare a Statement of Cost showing Total Cost of each variety and ascertain the Total profit.

	A	B
Materials	60,000	1,00,000
Wages	1,20,000	1,40,000

Works on Cost is charged at 40% of Works Cost and Office on Cost is taken at 20% on Total Cost. Article 'A' sold during the period are 180 at Rs. 2,400 each and Article of B' sold are 200 at Rs. 3,000 each. **(Unit-IV, Prob.12)**

16. The following figures have been taken from the books of a firm.

	Rs.		Rs.
Raw Materials Opening	80,000	Finished Goods Opening	20,000
Raw Materials - Closing	60,000	Finished Goods - Closing	30,000
Purchase of Raw Materials	3,00,000	Direct Wages	2,40,000
Factory Expenses	2,40,000	Office Expenses	1,00,000
Sales	9,79,000		

What should be the quotation of a job requiring Rs.4,000 in material and Rs.6,000 in Direct Wages **(Unit-IV, Prob.22)**

17. Prepare (i) Contract A/c and (ii) Contractee A/c for the year 2018 and 2019 taking into consideration such profit for transfer to Profit & Loss A/c as you think proper.

	2018 (Rs.)	2019 (Rs.)
Materials used	6,00,000	1,68,000
Direct Wages	4,60,000	2,10,000
Direct Expenses	44,000	20,000
Indirect Expenses	12,000	2,800
Work Certified	15,00,000	20,00,000
Work Uncertified	16,000	- -
Materials at Site	10,000	14,000
Plant Issued	28,000	4,000
Cash Received from Contractee	12,00,000	20,00,000

The value of the Plant at the end of 2018 was Rs. 14,000 and at the end of 2019 Rs.10,000. **(Unit-V, Prob.10)**

18. Make out the necessary Accounts from the following details:-

	Process A	Process B
Materials	Rs. 60,000	Rs. 6,000
Labour	Rs. 20,000	Rs. 24,000
Overheads	Rs. 14,000	Rs. 17,200
Inputs (Units)	20,000	17,500
Normal Loss	10%	4%
Sale Value of Wastage per Unit	Rs. 1	Rs. 2

There was no Opening or Closing Stock or Work in Progress Final Output from Process 'B' was 17,000 Units. **(Unit-V, Prob.24)**

FACULTY OF COMMERCE

B.Com III Year V-Semester (CBCS) Examination

(Common Paper for General / Computers / Computer Applications / Advertising / Foreign Trade and Tax Procedure Courses)

November / December - 2019

COST ACCOUNTING

Time : 3 Hours] **[Max. Marks : 80**

PART – A (5 × 4 = 20 Marks)

[Short Answer Type]

Note: Answer any **FIVE** of the following questions

ANSWERS

1. Cost Sheet **(Unit-IV, SQA- 3)**
2. Just in Time (JIT) **(Unit-II, SQA-7)**
3. Indirect Labour Cost **(Unit-III, SQA-2)**
4. Features of Job Costing **(Unit-IV, SQA-5)**
5. Abnormal Gain **(Unit-V, SQA-11)**
6. From the information given below calculate EOQ

   Annual usage 8000 units

   Purchase Price per unit ` 10

   Ordering Cost per Order ` 80

   Carrying Cost 20% p.a. per Unit Cost. **(Unit-II, Prob.9)**
7. The following information is extracted from the job ledger of Devi

   Enterprises in respect of Job No. 454

   Materials ` 6,800; Wages 100 hours @ ` 5

   Variable Overheads incurred for all Job ` 10,000 for 5,000 labour hours

   Find the profit if the job is billed for ` 9,000 **(Unit-IV, Prob.24)**
8. The output of process X was 5000 units, normal loss allowed was 10% of input.

   Abnormal loss was 400 units. The following further information is obtained.

   Material Rs. 5 per unit, Overheads ` 6,700, Labour ` 8,000,

   Wastage realized ` 2.50 per unit

   Prepare Process X Account. **(Unit-V, Prob.17)**

PART – B (5 × 12 = 60 Marks)

[Essay Answer Type]

Note: Answer all the questions

9. (a) Define Cost Accounting? Explain objectives and scope of Cost Accounting. **(Unit-I, Q.No.1,4,5)**

OR

(b) Discuss the difference between Cost Accounting and Financial Accounting. **(Unit-I, Q.No.9)**

10. (a) Discuss the various types of Inventory Control Techniques. **(Unit-II, Q.No.3)**

OR

(b) From the following details, prepare the Store Ledger using "Weighted Average" method of valuing the issues.

Nov. 2018	1	Opening Stock 2,000 units @ ` 5.00 each
	3	Issued 1,500 units to production department
	5	Received 4,500 units ` Rs. 6.00 each
	10	Issued 1,600 units
	12	Returned to stores 100 units by Production Department (from the issue of Nov. 3)
	16	Received 2,400 units @ ` 6.50 each
	19	Returned to supplier 200 units out of humanity received on Nov. 5.
	20	Received 1,000 units @ ` 7.00 each
	24	Issued to production 2,100 units
	27	Received 1,200 units @ ` 7.50 each
	29	Issued to production 2,800 units.

(Unit-II, Prob.26)

11. (a) A worker takes 48 hours to do a job for which the time allowed is 60 hours. His wage rate is Rs.10 per hour.

Calculate the works cost of the job under the following methods of payment of wages

a) Halsey plan

b) Rowan Plan

Additional Information

Material Cost ` 1,000

Overheads @ 150% of wages **(Unit-III, Prob.20)**

OR

(b) In a manufacturing concern there are court departments viz A, B, C & D. A and B are production departments and C & D are Service Departments. C renders service worth ` 12,000 to D and Balance to A & B in the ratio of 3:2. D renders service to A and B in the ratio of 9:1.

The overhead expenses incurred in a year are as follows:

	`
Depreciation	95,000
Rent, Rates and Taxes	18,000
C Insurance	7,600
Power	10,000
Canteen Expenses	5,400
Electricity	2,400

Following further information are given regarding the departments.

	A	B	C	D
Direct Material `	6,000	5,000	3,000	2,000
Direct labour `	20,000	10,000	10,000	5,000
Floor Space occupied (Sq.ft)	5,000	4,000	1,000	2,000
Value of Assets (in lakhs)	10	5	3	1
H.P. of Machines	1,000	500	400	100
No. of workers	100	50	50	25
Light and Fan Points	50	30	20	20

From the above particulars prepare a statement showing overhead expenses of production Departments A and B after distribution of Service Department's expenses. **(Unit-III, Prob.25)**

12. (a) Following information in respect of Job No. 222 is given below:

Materials ` 5,800

Wages

Department A - 100 hours @ ` 5 per hour

Department B - 200 hours @ ` 3 per hour

Overheads for the two departments are estimated as

A) Variable Overheads:

Department A - ` 10,000 for 5,000 direct labour hours

Department B - ` 30,000 for 10,000 direct labour hours

B) Fixed Overheads:

Rs. 50,000 for 50,000 normal working hours.

Calculate the cost of this job and also the price to be charged so as to give a profit of 20% on selling price.

(Unit-IV, Prob.30)

OR

(b) From the following, prepare a Cost Sheet and Quote a suitable prices.

Total production	5,000 tons
Cost of Raw Material	` 20,00,000
Carriage Inwards	` 2,00,000
Direct wages	` 20,00,000
Indirect wages	` 1,00,000
Office Expenses	` 10,00,000
Selling Overheads	` 10,00,000
Payment of Income Tax	` 3,00,000
Dividend paid	` 5,00,000

A profit Margin of 50% on cost in desired **(Unit-IV, Prob.23)**

13. (a) From the following information prepare

a) The Contract Accounts

b) Contractee's Accounts

Materials sent to site	85,349
Labour engaged on site	74,375
Plant installed at cost	15,000
Direct Expenditures	4,126
Establishment charges	3,167
Materials returned to stores	549
Work Certified	1,95,000
Cost of work not certified	4,500
Material on hand, Dec. 31	1,883
Wages accrued on Dec. 31	2,400
Direct expen. accrued on 31st Dec.	240
Value of plant on Dec. 31st	11,000

The contract price has been agreed at ` 2,50,000. Cash has been received from the contractee amounting to ` 1.80,000. **(Unit-V, Prob.12)**

OR

(b) Product X is obtained after it passes through 3 district processes. You are required to prepare process accounts from the following information.

	Total	Process - I	Process - II	Process - III
Material	15,084	5,200	3,960	5,924
Direct Wages	18,000	4,000	6,000	8,000
Production Overheads	18,000	-	-	-

1,000 units @ ` 6 per unit were introduced in Process-I. Production Overheads are to be distributed at 100% on Direct Wages.

	Actual Output	Normal Loss	Value of Scrap per unit
Process - I	950	5%	` 4.00
Process - II	840	10%	` 8.00
Process - III	750	15%	` 10.00

(Unit-V, Prob.26)

FACULTY OF COMMERCE

B.Com III Year V-Semester (CBCS) Examination

(Common Paper for General / Computers / Computer Applications / Advertising / Foreign Trade / and Procedure Tax Courses)

June / July - 2019

COST ACCOUNTING

Time : 3 Hours] **[Max. Marks : 80**

PART - A - (5 × 4 = 20 Marks)

[Short Answer Type]

Note : Answer any **FIVE** of the following questions

ANSWERS

1. What is a Cost Centre? **(Unit-I, SQA-8)**
2. Define Economic Order Quantity. **(Unit-II, SQA-4)**
3. What do you understand by Labour Turnover? **(Unit-III, SQA-17)**
4. On the basis of the following information, calculate the total earnings of a worker under Halsey Plan.
   Standard Time = 15 hours
   Time taken = 10 hours
   Rate per hour = 3 Rs. **(Unit-III, Prob.5)**
5. Explain Job Costing. **(Unit-IV, SQA-8)**
6. Calculate the amount of Profit Transferred to Profit of Loss Account from the following: Contract Price Rs. 16,00,000, Cash reserved Rs. 4,90,000 (being 70% of Work Certified), Not Certified Rs. 60,000. Total expenditure incurred Rs. 6,40,000. **(Unit-V, Prob.2)**
7. Explain the meaning of Process Costing. **(Unit-V, SQA- 3)**
8. Calculate the Cost of Abnormal Loss from the figures given below:
   Normal Output = 9000 units
   Actual Output = 8500 units
   Normal Cost of Normal Output = Rs. 27,000. **(Unit-V, Prob.16)**

PART - B - (5 × 12 = 60 Marks)

[Essay Answer Type]

Note : Answer all the questions

9. (a) Define Cost Accounting? And explain its advantages and disadvantages. **(Unit-I, Q.No.1,6,7)**

OR

(b) Explain the differences between Cost Accounting and Financial Accounting. **(Unit-I, Q.No.9)**

10. (a) Two components A and B are used as follows:

Normal Usage 50 units per week

Minimum Usage 25 units per week

Maximum Usage 75 units per week

Re-order Quantity A - 300 units, B - 500 units

Re-order Period A - 4 to 6 weeks B - 2 to 4 weeks

Calculate Stock Levels for each Component. **(Unit-II, Prob.3)**

OR

(b) Following transactions are recorded in respect of Materials.

Date	Recovered Units	Date (Per unit)	Issued Quantity
3-12-2017	400	2.10	–
15-12-2017	500	2.20	–
20-12-2017	–	–	500
26-12-2017	600	2.50	–
28-12-2017	–	–	900

Prepare Stores Ledger by using Weighted Average Method. **(Unit-II, Prob.25)**

11. (a) Calculate the Earnings of a worker from the following information.

a) Time Rate Method

b) Halsey Plan and

c) Rowan Plan

Standard Time = 30 hours

Time taken = 20 hours

Hourly rate = 1 Re per hour plus Dearness Allowance Rs. 0.50 Paise per hour worked. **(Unit-III, Prob.19)**

OR

(b) The following figures are available for the month of 25 working days 8 hours every day.

Expenses	Total	Service Dept.	Production Dept.		
			A	B	C
Power	1000	240	200	200	360
Salary	2000	–	–	–	–
Rent	500	–	–	–	–
Welfare	600	–	–	–	–
Others	1200	200	200	400	400
No. of workers		10	30	40	20
Floor Area		500	600	800	600
Salary		20%	30%	30%	20%
Service Dept., to Production Dept.		–	50	30%	20%

Calculate Labour Hour Rate for each Dept. A, B and C. **(Unit-III, Prob.24)**

12. (a) Following information is from manufacturing account of a Factory, for the year ending 31-12-1980.

Material Consumed Rs. 6,00,000

Wages Rs. 4,00,000

Factory Expenses Rs. 2,40,000

Office Expenses Rs.1,55,000

During 1981, the factory received a request from customer for quotation, which estimated Material Rs. 40,000 and Wages Rs. 30,000. What should be the quotation if the factory desires to make a profit 25% on Selling Price?

(Unit-IV, Prob.20)

OR

(b) The following particulars relate to Job No. 323

Materials used Rs. 500

Direct Wages

X 10 hours @ 2.50 per hour

Y 8 hours @ 3.00 per hour

Z 5 hours @ 4.00 per hour

Variable Overheads

X 7000 labour hours Rs. 7,000

Y 3000 labour hours Rs. 6,000

Z 1000 labour hours Rs. 4,000

Fixed overheads Rs. 30,000 for 7500 working hours. You are required to calculate the Cost of Job No. 323 and calculate the Price to give the profit of 33 on Selling Price. **(Unit-IV, Prob.25)**

13. (a) Prepare Contract Account from the information given below:

	1988-89 Rs	1989-90 Rs
Materials	3,00,000	84,000
Wages	2,30,000	1,05,000
Expenses	35,000	15,400
Materials at end	13,000	7,000
Cash received	6,00,000	10,00,000
Certified Completion of Work	75%	100%

(Unit-V, Prob.11)

OR

(b) Prepare the Process Accounts A and B from the following details.

	Process - A	Process - B
Materials	30,000	3,000
Labour	10,000	12,000
Overheads	7,000	8,600
Input (units)	20,000	17,500
Normal loss	10%	4%
Sale Value of Wastage per unit	1	2

There was no Opening and Closing Stock.2

Final output from Process - B was 17,000 units. **(Unit-V, Prob.25)**

FACULTY OF COMMERCE

B.Com III Year V-Semester (CBCS) Examination

(Common for General / Computers / Computer Applications / Advertising / Foreign Trade and Tax Procedure Courses)

November / December - 2018

COST ACCOUNTING

Time : 3 Hours] **[Max. Marks : 80**

PART - A (5 × 4 = 20 Marks)

Note : Answer any **FIVE** of the following questions.

ANSWERS

1. Mention the various Elements of Cost. **(Unit-I, SQA-16)**
2. Find the Price to be quoted for the following :
   Direct Material Rs. 1500, Labour 1200, Direct Expenses Rs. 100
   Work overheads 50% of Prime Cost, Office overheads 10% of works cost,
   Profit on Selling Price 25%. **(Unit-IV, Prob.14)**
3. What is EOQ ? **(Unit-II, SQA-4)**
4. Explain about "Idle Time". **(Unit-V, SQA-9)**
5. Prepare Contract Account from the following
   Contract price Rs. 10,00,000. Expenses Incurred Rs. 4,00,000, Work Certified Rs. 8,00,000 Cash received Rs. 6,00,000 **(Unit-V, Prob.3)**
6. What do you mean by Notional Profit ? **(Unit-V, SQA-10)**
7. In a process 1000 units introduced at a cost Rs. 20,000, other Expenses were Rs. 10,000, Wages Rs. 1020. Normal loss 10% and scrap is Rs. 5 per unit. Normal output 1000 units, Actual output is 700 units. Find out the Abnormal loss. **(Unit-V, Prob.18)**
8. Write about ABC Analysis. **(Unit-II, SQA.5)**

PART - B (5 × 12 = 60 Marks)

Note : Answer all the questions.

9. (a) What is Cost Accounting ? State briefly the scope of Cost Accounting. **(Unit-I, Q.No.1,5)**

   OR

   (b) What are the characteristics of an ideal Costing system? **(Unit - I, Q.No.8)**

10. (a) What do you understand by Re-order level? Calculate the Maximum, Minimum and Re-order level from the given data :

Re-Ordering Quantity	1500 units
Re-Ordering Period	4 to 6 weeks
Maximum Consumption	400 units per week
Minimum Consumption	250 units per week
Normal Consumption	300 Units per week

(Unit-II, Prob.4)

OR

(b) From the following particulars, prepare stores Ledger by using FIFO method.

Jan 1 Opening Balance 500 units @ 4 Rs. per unit

Jan 5 Received from Vendor 200 units @ 4.25 Rs. per unit

Jan 12 Received from Vendor 150 units @ 4.10 Rs. per unit

Jan 20 Received from Vendor 300 units @ 4.50 Rs. per unit

Jan 25 Received from Vendor 400 units @ 4.00 Rs. per unit

Issue of Materials :

Jan. 4 – 200 units, Jan. 10th – 400 units

Jan. 15 – 100 units, Jan. 19th – 100 units

Jan. 26 – 200 units, Jan. 30th – 250 units **(Unit-II, Prob.11)**

11. (a) From the following particulars, calculate earnings of two workers (A & B) who are paid wages under Merriek differential system.

Normal piece rate (upto 83%) Rs. 5 per unit

Task rate is 40 units per week

Output of the workers : A – 32 units
B – 42 units **(Unit-III, Prob.21)**

OR

(b) Apportion the overheads among the Department A, B, C & D

	Rs.
Works Manager Salary	4,000
Power	21,000
P. F.	9,000
Plant Maintenance	4,000
Depreciation	20,000
Canteen Expenses	12,000
Rent	6,000

Additional Information :

	A	B	C	D
No. of Employees	16	8	4	4
Area Occupied (SFT)	2,000	3000	500	500
Plant (Rs.)	75,000	1,00,000	25,000	–
Wages (Rs.)	40,000	20,000	10,000	5,000
H.P.	3	3	1	–

(Unit-III, Prob.26)

12. (a) The accounts of a manufacturing Company showed the following details :

Material used Rs. 6,00,000 ; Wages Rs. 5,00,000, Works expenses Rs. 1,00,000; General Expenses Rs. 60,000

What price the company should quote, on the basis of above information to manufacture a machine which would require Material Rs. 6000 and Labour Rs. 3000. So, that the price will yield a profit of 25% on selling price.

(Unit-IV, Prob.15)

OR

(b) Following information extracted from costing records of a company, in respect to

Job No : 100

Material : Rs. 4000

Wages :

A 80 hours @ Rs. 4 per hour

B 70 hours @ Rs. 3 per hour

C 50 hours @ Rs. 5 per hour

Factory overheads :

A Rs. 8000 for 8000 hours

B Rs. 4000 for 2000 hours

C Rs. 2000 for 1000 hours

Fixed overheads : Rs. 9000 for 9000 hours

your are required to calculate the price to be changed so on to give a profit of 20% on selling price. **(Unit-IV, Prob.28)**

13. (a) The following was the expenditure on a contract of Rs. 12,00,000.

Material	Rs. 2,40,000
Wages	Rs. 3,28,000
Plant	Rs. 40,000
Other expenses	Rs. 17,200

Cash received Rs. 4,80,000 being 80% of work certified Material on hand Rs. 20,000, Plan had undergone 20% depreciation. Prepare Contract Account. **(Unit-V, Prob.13)**

OR

(b) The product of a Manufacturing concern passes through two process A and B then to Finished product.

Each process normally has 5% loss in weight and 10% is scrap which from A and B realises Rs. 80 per kg and Rs. 200 per kg. respectively.

Following are the figures relating to two process :

	Process - A	Process - B
Material in kgs	1000	70
Cost of the Material (Rs) per kg	125	200
Wages (Rs.)	28000	10,000
Expenses (Rs.)	8000	5250
Output in kgs	830	780

Prepare process accounts showing Cost per kg of each process. **(Unit-V, Prob.27)**

KAKATIYA UNIVERSITY

FACULTY OF COMMERCE

B.Com III Year V-Semester (CBCS) Examination

December - 2018

COST ACCOUNTING

Time : 3 Hours] **[Max. Marks : 80**

SECTION – A (5 × 4 = 20 Marks)

Note: Answer all the questions

ANSWERS

1. Write any five of the following questions:

   (a) Write any four advantages of Cost Accounting. **(Unit-I, SQA-6)**

   (b) What is ABC analysis? Explain. **(Unit-II, SQA-5)**

   (c) Calculate EOQ from the following

   Annual Consumption = 3,600 units, Ordering Cost `144 per order, Carrying Cost 20%, Price per unit ` 400. **(Unit-II, Prob.10)**

   (d) Distinguish between direct and indirect labour. **(Unit-III, SQA-18)**

   (e) From the following particulars, calculate the earnings of 2 workers A and B who are paid wages under the Merrick Differential System.

   Normal piece rate (upto 83% of high task output) ` 40 per unit.

   High task rate 40 units per week. Output of the workers for the week: A-32 units, B-42 units. **(Unit-III, Prob.22)**

   (f) How do you classify overheads? Discuss briefly. **(Unit-III, SQA-16)**

   (g) For product A, the prime cost is ` 200 per unit, factory overheads are 20% of prime cost.

   Administrative overheads are 25% of works cost. Profit is 25% on selling price. Calculate Selling Price. **(Unit-IV, Prob.4)**

   (h) Calculate cost of abnormal loss from the figures given below:

   Normal Output 18,000 units, Actual Output 17,000 units, Normal Cost of Normal Output ` 54,000. **(Unit-V, Prob.19)**

PART – B (5 × 12 = 60 Marks)

[Essay Answer Type]

Note: Answer all the questions

2. (a) Define Cost Accounting. Write its advantages. **(Unit-I, Q.No.1,6)**

OR

(b) The Ajantha Engineering Co. Ltd. manufactured and sold 1,000 calculators in 2017. The following are the particulars regarding the calculators sold and manufactured by them.

Particulars	`
Cost of Materials	1,60,000
Wages paid	2,40,000
Manufacturing expenses	1,00,000
Salaries	1,20,000
Rent, Rates & Insurance	20,000
Selling expenses	60,000
General expenses	40,000
Sales	8,00,000

The Company desires to supply 200 calculators to a commercial concern. You are required to prepare a statement showing the price at which calculators should be sold so as to show a profit of 10% on the selling price.

The following additional information is supplied to you:

(i) The price of materials will rise by 20% on the previous year's level.

(ii) Wages will rise up by 5%.

(iii) Manufacturing expenses will rise by 10%.

(iv) Office and selling expenses per unit will remain the same. **(Unit-IV, Prob.21)**

3. (a) What is centralized buying? Write its advantages and disadvantages. **(Unit-II, Q.No.6)**

OR

(b) From the following information, prepare Stores Ledger Account showing the issue of material on FIFO Method and give the value of stock at the end of the period.

1s' October 2017	Balance 500 units at ` 5 per unit
10th October 2017	Purchased 350 units at ` 5 per unit
18th October 2017	Issued 550 units to Department X
21st October 2017	Purchased 180 units at ` 5-50 p per unit
25th October 2017	Purchased 350 units at ` 6 per unit
1st November 2017	Issued 375 units' to Department Y
10th November 2017	Purchased 200 units at ` 6-50 per unit
20lh November 2017	Issued 250 units to Department Z

(Unit-II,Prob.12)

4. (a) Discuss about the various Incentive Wage Plans. **(Unit-III, Q.No.4)**

OR

(b) A Company has three Production Departments and two Service Departments and for the year 2017, the departmental distribution summary has the following totals.

Production Departments:

A ` 30,000, B ` 20,000 and C ` 10,000	` 60,000
Service Departments:	
X ` 5,850, Y ` 7,500	` 13,350
Total	` 73,350

The expenses of the Service Departments are charged out on a percentage basis as follows:

	A	B	C	X	Y
Service Department X	30%	40%	20%	–	10%
Service Department Y	20%	20%	40%	20%	–

Prepare a statement showing the apportionment of two Service Departments expenses to Production Departments by simultaneous

Equation Method and Repeated Distribution Methods. **(Unit-III, Prob.31)**

5. (a) Define Job Costing. Write its features and advantages. **(Unit-IV, Q.No.5,6)**

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(b) The Ajantha Engineering Co. Ltd. manufactured and sold 1,000 calculators in 2017. The following are the particulars regarding the calculators sold and manufactured by them.

	`
Cost of Materials	1,60,000
Wages paid	2,40,000
Manufacturing expenses	1,00,000
Salaries	1,20,000
Rent, Rates & Insurance	20,000
Selling expenses	60,000
General expenses	40,000
Sales	8,00,000

The Company desires to supply 200 calculators to a commercial concern. You are required to prepare a statement showing the price at which calculators should be sold so as to show a profit of 10% on the selling price.

The following additional information is supplied to you:

(i) The price of materials will rise by 20% on the previous year's level.

(ii) Wages will rise up by 5%.

(iii) Manufacturing expenses will rise by 10%.

(iv) Office and selling expenses per unit will remain the same.

(Unit-IV, Prob.21)

6. (a) What is Process Costing? Write its features and advantages. **(Unit-V, Q.No.6,7)**

OR

(b) A Contractor's accounting year ends on 31st December every year. The following particulars relate to Contract No. 715, which remains incomplete on 31st December, 2017.

	`
Wages paid	1,62,000
Materials used	1,68,000
Plant sent to site	24,800
Direct expenses paid	9,200
Value of plant on 31.12.2017	20,000
Work certified by engineer	4,00,000
Cost of work not yet certified	6,600
Agreed contract price	5,00,000
Cash received	3,60,000
Wages accrued on 31.12.2017	3,120
Direct expenses accrued on 31.12.2017	640
Establishment charges applicable to work No. 715	27,360
Materials on hand on 31.12.2017	4,520

Prepare Contract Account crediting Profit & Loss A/c with two thirds of profit as reduced to the cash received. **(Unit-V, Prob.14)**

MAHATMA GANDHI UNIVERSITY

FACULTY OF COMMERCE

B.Com III Year V-Semester (CBCS) Examination

November / December - 2018

COST ACCOUNTING

Time : 3 Hours] **[Max. Marks : 80**

PART – A (5 × 4 = 20 Marks)

[Short Answer Type]

Note: Answer all the questions

ANSWERS

1. What is a "Cost Centre"? **(Unit-I, SQA-8)**
2. What do you mean by ABC Analysis? **(Unit-II, SQA-5)**
3. Distinguish between direct labour cost and indirect labour cost. **(Unit-III, SQA-18)**
4. Define "Job Costing". **(Unit-IV, SQA-8)**
5. Calculate cost of abnormal loss from the figures given below:

Normal output	18,000 Units
Actual output	17,000 units
Normal cost of normal output	` 54,000

(Unit-V, Prob.19)

PART – B (5 × 12 = 60 Marks)

[Essay Answer Type]

Note: Answer all the questions

6. (a) Define Cost Accounting. Explain its advantages and disadvantages. **(Unit-I, Q.No.1,6,7)**

OR

(b) Describe the differences between Financial Accounting and Cost Accounting. **(Unit-I, Q.No.9)**

7. (a) From the following particulars prepare the stores ledger under weighted average price method.

October 1 Opening balance 500 units @ ` 9.50 per unit.
October 6 Issued 250 units
October 8 Received 250 units @ ` 8.75 per unit
October 13 Issued 350 units
October 19 Received 450 units @ ` 9.50 per unit
October 23 Issued 350 units
October 30 Received 350 units @ ` 9.40 per unit

(Unit-II, Prob.27)

(b) Set up a "Stores ledger" form and enter the following transactions adopting the FIFO method of pricing out issues.

2015

September 1	Opening balance 100 units @ ` 4 per unit.
September 5	Issued out to production 40 units
September 7	Purchased 90 units @ ` 5 per unit
September 9	Issued out 40 units to production
September 19	Purchased 140 units @ ` 4 per unit
September 24	Received back into stores 38 units out of 40 units issued on 9th September 2015
September 27	Issued to production 20 units

(Unit-II, Prob.13)

8. (a) Based on the following information, calculate the earning of P, Q, R and S under Merrick's multiple piece rate system. Standard production per hour 12 units. Normal rate ` 0.80 per hour. In an 8 hour day. P produces 75 units, Q produces 85 units, R 99 units and S 105 units. **(Unit-III, Prob.23)**

OR

(b) Prepare a machine hour rate to cover the overhead expenses given below:

Electric power	0.80 per hour
Steam	0.15 per hour
Water	0.025 per hour
Repairs	` 650 per annum
Rent	` 540 per annum
Original cost of machinery	` 25,000 per annum
Running hours during the year	2000 hours
Depreciation	15% p.a on the original cost.

(Unit-III, Prob.33)

9. (a) From the following particulars, prepare a cost sheet showing

(i) Cost of materials used

(ii) Prime cost

(iii) Works cost

(iv) Cost of Production

(v) Percentage of works overhead to productive wages and

(vi) Percentage of general overhead to works cost.

Stock materials, 1st January 2013 ` 20,000

Stock of finished goods on 1st January 2013 ` 51,000

Raw materials purchased ` 5,80,000.

Productive wages ` 2,90,000 Sales ` 12,12,000

Stock of materials unused, 31st December 2013 ` 25,000

Works overhead ` 86,000

Office and general expenses ` 72,000

Stock of finished goods 31st December 2013 ` 48,000

(Unit-IV, Prob.13)

OR

(b) Following information has been extracted from the costing records of Vinay Engineering Works, Hyderabad in respect of Job No. 75.

Materials ` 20,000

Department A 80 hours @ ` 8 per hour

Department B 70 hours @ ` 6 per hour

Department C 50 hours @ ` 10 per hour

Variable Overheads :

Department A ` 80,000 for 8,000 direct labour hours

Department B ` 4,000 for 2,000 direct labour hours

Department C ` 2,000 for 1,000 direct labour hours

Fixed overheads :

Estimate at ` 9,000 for 9,000 normal working hours. You are required to calculate the price to be charged so as to give a profit of 20% on selling price.

(Unit-IV, Prob.29)

10. (a) The following was the expenditure on contract No. 646 for 45,00,000 which started in January 2016.

	`
Materials	9,00,000
Wages	12,30,000
Plant	1,50,000
Direct charges	64,500

Cash received on account upto 31st December, amounted to ` 18,00,000 being 80% of the work certified. The value of materials on hand at 31st. December is ` 75,000. Prepare contract account. 10% depreciation on plant was to be charged.

(Unit-V, Prob.15)

OR

(b) A product passes through three stages of production and the product of each stage becomes the raw materials of the next stage. Further raw materials are also added at each stage. During March 2014, 2000 units of finish product were produced with the following expenditure.

	Stage-A	Stage-B	Stage-C
Materials	20,000	16,000	8,000
Labour	16,000	24,000	12,000
Direct expenses	1,200	2,000	800

Indirect expenses amounted to ` 2,600. It is to be apportioned on the basis of labour. Main raw issued to stage (besides above) was worth ` 12,000. Prepare the process cost accounts. **(Unit-V, Prob.28)**

FACULTY OF COMMERCE

B.Com III Year V-Semester (CBCS) Examination

(Common Paper for General / Computers / Computer Applications / Advertising / Foreign Trade and Tax Procedure Courses)

MODEL PAPER - I

COST ACCOUNTING

Time : 3 Hours] **[Max. Marks : 80**

PART – A (5 × 4 = 20 Marks)

Note: Answer any **FIVE** questions

ANSWERS

1. Define cost accounting. **(Unit-I, SQA-1)**
2. ABC Analysis **(Unit-I, SQA-5)**
3. Calculate EOQ from the following Annual Consumption = 3,600 units, Ordering Cost `144 per order, Carrying Cost 20%, Price per unit ` 400. **(Unit-II, Prob.10)**
4. On the basis of the following information, calculate the total earnings of a worker under Halsey Plan.
   Standard Time = 15 hours
   Time taken = 10 hours
   Rate per hour = 3 Rs. **(Unit-III, Prob.5)**
5. Machine hour rate **(Unit-III, SQA.13)**
6. Unit costing **(Unit-IV, SQA.1)**
7. Prepare Contract Account from the following
   Contract price Rs. 10,00,000. Expenses Incurred Rs. 4,00,000, Work Certified Rs. 8,00,000 Cash received Rs. 6,00,000 **(Unit-V, Prob.3)**
8. In a process 1000 units introduced at a cost Rs. 20,000, other Expenses were Rs. 10,000, Wages Rs. 1020. Normal loss 10% and scrap is Rs. 5 per unit. Normal output 1000 units, Actual output is 700 units. Find out the Abnormal loss. **(Unit-V, Prob.18)**

PART – B (5 × 12 = 60 Marks)

Note: Answer all the questions

9. (a) Discuss the essential principle of good cost accounting system. **(Unit-I, Q.No.8)**

   OR

   (b) Explain the various methods of cost. **(Unit-I, Q.No.1)**

10. (a) Set up a "Stores ledger" form and enter the following transactions adopting the FIFO method of pricing out issues.

2015

September 1 Opening balance 100 units @ ` 4 per unit.

September 5 Issued out to production 40 units

September 7 Purchased 90 units @ ` 5 per unit

September 9 Issued out 40 units to production

September 19 Purchased 140 units @ ` 4 per unit

September 24 Received back into stores 38 units out of 40 units issued on 9th September 2015

September 27 Issued to production 20 units **(Unit-II, Prob.13)**

OR

(b) Discuss in detail about the issue of materials to production. **(Unit-II, Q.No.5)**

11. (a) Calculate the Earnings of a worker from the following information.

(a) Time Rate Method

(b) Halsey Plan and

(c) Rowan Plan

Standard Time = 30 hours

Time taken = 20 hours7

Hourly rate = 1 Re per hour plus Dearness Allowance Rs. 0.50 Paise per hour worked. **(Unit-III, Prob.19)**

OR

(b) Compute the Machine Hour Rate from the following data. Cost of the Machine Rs.2,00,000, Installation Charges Rs.20,000, Estimated Scrap Value after Expiry of its life of 15 years Rs. 10,000. Rent and Rates of the Shop per month Rs.400, General Lighting Rs.600 p.m. for the shop. Shop Supervisor's Salary Rs.1,200 p.m., Insurance Premium for the Machine Rs.1,920 p.a., Estimated Repairs and Maintenance Rs.2,000 p.a., Power Consumption of the Machine: 10 Units per hour, at Rs.40 per 100 Units. Estimated working hours of the Machine per year (including set up time of 200 hours): 2,200. The machine occupies ¼ of the total floor area of the shop. The Supervisor of the shop devotes 1 /5th of his time for Supervising the Machine. **(Unit-III, Prob.32)**

12. (a) From the following particulars, prepare a cost sheet showing

(i) Cost of materials used

(ii) Prime cost

(iii) Works cost

(iv) Cost of Production

(v) Percentage of works overhead to productive wages and

(vi) Percentage of general overhead to works cost.

Stock materials, 1st January 2013 ` 20,000

Stock of finished goods on 1st January 2013 ` 51,000

Raw materials purchased ` 5,80,000.

Productive wages ` 2,90,000 Sales ` 12,12,000

Stock of materials unused, 31st December 2013 ` 25,000

Works overhead ` 86,000

Office and general expenses ` 72,000

Stock of finished goods 31st December 2013 ` 48,000 **(Unit-IV, Prob.13)**

OR

(b) Explain the procedure and preparation of job sheet? **(Unit-IV, Q.No.8)**

13. (a) From the following information prepare

(a) The Contract Accounts

(b) Contractee's Accounts

Materials sent to site	85,349
Labour engaged on site	74,375
Plant installed at cost	15,000
Direct Expenditures	4,126
Establishment charges	3,167
Materials returned to stores	549
Work Certified	1,95,000
Cost of work not certified	4,500
Material on hand, Dec. 31	1,883
Wages accrued on Dec. 31	2,400
Direct expenses accrued on 31st Dec.	240
Value of plant on Dec. 31st	11,000

The contract price has been agreed at ` 2,50,000. Cash has been received from the contractee amounting to ` 1.80,000. **(Unit-V, Prob.12)**

OR

(b) The product of a Manufacturing concern passes through two process A and B then to Finished product.

Each process normally has 5% loss in weight and 10% is scrap which from A and B realises Rs. 80 per kg and Rs. 200 per kg. respectively.

Following are the figures relating to two process :

Particulars	Process - A	Process - B
Material in kgs	1000	70
Cost of the Material (Rs) per kg	125	200
Wages (Rs.)	28000	10,000
Expenses (Rs.)	8000	5250
Output in kgs	830	780

Prepare process accounts showing Cost per kg of each process. **(Unit-V, Prob.27)**

FACULTY OF COMMERCE

B.Com III Year V-Semester (CBCS) Examination

(Common Paper for General / Computers / Computer Applications / Advertising / Foreign Trade and Tax Procedure Courses)

MODEL PAPER - II

COST ACCOUNTING

Time : 3 Hours] **[Max. Marks : 80**

PART – A (5 × 4 = 20 Marks)

Note: Answer any **FIVE** questions

ANSWERS

1. Explain the features of cost accounting. **(Unit-I, SQA-2)**
2. EOQ **(Unit-II, SQA- 4)**
3. The annual demand for an electronic item is approximately 9125 items. Every time an order is placed a fixed cost of Rs. 25 is incurred. The holding cost per item of inventory is Rs. 146. Calculate Economic Order Quantity. **(Unit-II, Prob.5)**
4. Prepare a machine hour rate to cover the overhead expenses given below:

Electric power	0.80 per hour
Steam	0.15 per hour
Water	0.025 per hour
Repairs	` 650 per annum
Rent	` 540 per annum
Original cost of machinery	` 25,000 per annum
Running hours during the year	2000 hours
Depreciation	15% p.a on the original cost.

(Unit-III, Prob.33)

5. Classfication of overheads. **(Unit-III, SQA.16)**
6. Features of Job Costing **(Unit-IV, SQA.5)**
7. Calculate the amount of Profit Transferred to Profit of Loss Account from the following: Contract Price Rs. 16,00,000, Cash reserved Rs. 4,90,000 (being 70% of Work Certified), Not Certified Rs. 60,000. Total expenditure incurred Rs.6,40,000. **(Unit-V, Prob.2)**
8. Calculate cost of abnormal loss from the figures given below:

Normal output	18,000 Units
Actual output	17,000 units
Normal cost of normal output	` 54,000

(Unit-V, Prob.19)

PART – B (5 × 12 = 60 Marks)

Note: Answer all the questions

9. (a) Explain the functions and scope of cost accounting. **(Unit-I, Q.No.5)**

OR

(b) What are the elements of cost ? **(Unit-I, Q.No.11)**

10. (a) What is centralized buying? Write its advantages and disadvantages. **(Unit-II, Q.No.6)**

OR

(b) From the following particulars, prepare stores Ledger by using FIFO method.

Jan 1 Opening Balance 500 units @ 4 Rs. per unit

Jan 5 Received from Vendor 200 units @ 4.25 Rs. per unit

Jan 12 Received from Vendor 150 units @ 4.10 Rs. per unit

Jan 20 Received from Vendor 300 units @ 4.50 Rs. per unit

Jan 25 Received from Vendor 400 units @ 4.00 Rs. per unit

Issue of Materials

Jan. 4 – 200 units, Jan. 10^{th} – 400 units

Jan. 15 – 100 units, Jan. 19^{th} – 100 units

Jan. 26 – 200 units, Jan. 30^{th} – 250 units **(Unit-II, Prob.11)**

11. (a) The following particulars relate to a manufacturing company which has three production departments P_1, P_2, P_3 and two service departments S_1 and S_2.

Department overhead as per primary distribution summary

Dpeartments

P_1	P_2	P_3	S_1	S_2
800	700	500	234	300

The company decided to charge the service department overheads on the basis of following percentages.

Service Departments	Production Departments			Service Departments	
	P1	P2	P3	S1	S2
S1	20%	40%	30	–	10%
S2	40%	20%	20%	20%	–

Find the total overheads of production departments charging service department costs to production departments on (a) repeated distribution and (b) by simultaneous equation method. **(Unit-III, Prob.30)**

OR

(b) What do you understand by reapportionment ? Write about the basis and various methods of reapportionment ? **(Unit-III, Q.No.7)**

12. (a) Following information is from manufacturing account of a Factory, for the year ending 31-12-1980.

Material Consumed	Rs. 6,00,000
Wages	Rs. 4,00,000
Factory Expenses	Rs. 2,40,000
Office Expenses	Rs.1,55,000

During 1981, the factory received a request from customer for quotation, which estimated Material Rs. 40,000 and Wages Rs. 30,000. What should be the quotation if the factory desires to make a profit 25% on Selling Price? **(Unit-IV, Prob.20)**

OR

(b) Following information extracted from costing records of a company, in respect to

Job No : 100

Material : Rs. 4000

Wages :

A 80 hours @ Rs. 4 per hour

B 70 hours @ Rs. 3 per hour

C 50 hours @ Rs. 5 per hour

Factory overheads :

A Rs. 8000 for 8000 hours

B Rs. 4000 for 2000 hours

C Rs. 2000 for 1000 hours

Fixed overheads : Rs. 9000 for 9000 hours

your are required to calculate the price to be changed so on to give a profit of 20% on selling price. **(Unit-IV, Prob.28)**

13. (a) A Contractor's accounting year ends on 31st December every year. The following particulars relate to Contract No. 715, which remains incomplete on 31st December, 2017.

Particulars	`
Wages paid	1,62,000
Materials used	1,68,000
Plant sent to site	24,800
Direct expenses paid	9,200
Value of plant on 31.12.2017	20,000
Work certified by engineer	4,00,000
Cost of work not yet certified	6,600
Agreed contract price	5,00,000
Cash received	3,60,000
Wages accrued on 31.12.2017	3,120
Direct expenses accrued on 31.12.2017	640
Establishment charges applicable to work No. 715	27,360
Materials on hand on 31.12.2017	4,520

Prepare Contract Account crediting Profit & Loss A/c with two thirds of profit as reduced to the cash received. **(Unit-V, Prob.14)**

OR

(b) Prepare the Process Accounts A and B from the following details.

Particulars	Process - A	Process - B
Materials	30,000	3,000
Labour	10,000	12,000
Overheads	7,000	8,600
Input (units)	20,000	17,500
Normal loss	10%	4%
Sale Value of Wastage per unit	1	2
There was no Opening and Closing Stock.		
Final output from Process - B was 17,000 units.		

(Unit-V, Prob.25)

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MODEL PAPER - III

COST ACCOUNTING

Time : 3 Hours] **[Max. Marks : 80**

PART – A (5 × 4 = 20 Marks)

Note: Answer any **FIVE** questions

ANSWERS

1. Cost Centre **(Unit-I, SQA-8)**
2. VED **(Unit-II, SQA-6)**
3. What do you understand by Re-order level? Calculate the Maximum, Minimum and Re-order level from the given data :

Re-Ordering Quantity	1500 units
Re-Ordering Period	4 to 6 weeks
Maximum Consumption	400 units per week
Minimum Consumption	250 units per week
Normal Consumption	300 Units per week

(Unit-II, Prob.4)

4. Distinguish between direct and indirect labour. **(Unit-III, SQA.18)**
5. Halsey Premium Plan **(Unit-III, SQA.6)**
6. Cost sheet **(Unit-IV, SQA.3)**
7. Contract Price Rs.25 Lakhs, Cash Received from the Contractee (being 80% of Work Certified) Rs.12 Lakhs, Uncertified Work Rs.50,000. Actual Expenditure incurred on the Contract Rs.10 Lakhs (including Closing Stock of Materials at Contract Site). Closing Stock at Contract Site Rs.40,000. Calculate the amount of Profit transfer to Profit and Loss Account from the above information. **(Unit-V, Prob.1)**
8. Calculate the Cost of Abnormal Loss from the figures given below:

   Normal Output = 9000 units

   Actual Output = 8500 units

   Normal Cost of Normal Output = Rs. 27,000. **(Unit-V, Prob.16)**

PART – B (5 × 12 = 60 Marks)

Note: Answer all the questions

9. (a) Explain the nature of cost accounting. **(Unit-I, Q.No.2)**

   OR

   (b) Distinguish between cost accounting and financial accounting. **(Unit-I, Q.No.9)**

10. (a) Prepare the Stores Ledger from the following transaction adopting the Weighted Average Method of Pricing out issues.

1st July Opening Balance 100 Units @ Rs. 6 per Unit
5th July Purchased 96 Units @ Rs.8 per Unit
7th July Issued out to Production 4 Units
9th July Issued out 40 Units to Production
19th July Purchased 152 Units @ 6 per Unit
25th July Received back into Stores 38 Units out of 40 Units issued on 9th July
28th July Issued to Production 20 Units. **(Unit-II, Prob.24)**

OR

(b) From the following details, prepare the Store Ledger using "Weighted Average" method of valuing the issues.

Nov. 2018 1 Opening Stock 2,000 units @ ` 5.00 each
3 Issued 1,500 units to production department
5 Received 4,500 units ` Rs. 6.00 each
10 Issued 1,600 units
12 Returned to stores 100 units by Production Department (from the issue of Nov. 3)
16 Received 2,400 units @ ` 6.50 each
19 Returned to supplier 200 units out of humanity received on Nov. 5.
20 Received 1,000 units @ ` 7.00 each
24 Issued to production 2,100 units
27 Received 1,200 units @ ` 7.50 each
29 Issued to production 2,800 units.

(Unit-II, Prob.26)

11. (a) Explain briefly about allocation and apportionment of overheads and the bases for both allocation and apportionment. **(Unit-III, Q.No.6)**

OR

(b) From the following details, compute hourly rate of a machine installed in a shop.

(a) Capital cost of the machine Rs. 10,000
Installation charges Rs. 1000
(b) The estimated scrap value after the expiry of its life = 3000 (10 yrs)
(c) General lighting of the shop per month Rs. 25
(d) Rent of the shop Rs, 125 per month.
(e) Shop supervisor's salary per month Rs. 240
(f) Insurance premium for the machine per year = 60
(g) Estimated repair and maintenance expenses for the Machine per year = Rs. 100.

(h) Power consumption of machine = 2 units per hour.
rate of power per 100 units = Rs. 5.

(i) Estimated working hours of the machine per year = 2000

(j) The machine occupies $\frac{1}{5}^{th}$ of the total floor area of the shop.

The supervisors in the shop is expected to devote $\frac{1}{6}^{th}$ of his time for supervising the machine. Generally lighting expenses are to be apportioned on the basis of the floor area. **(Unit-III, Prob.39)**

12. (a) The following particulars relate to Job No. 323
Materials used Rs. 500
Direct Wages
X 10 hours @ 2.50 per hour
Y 8 hours @ 3.00 per hour
Z 5 hours @ 4.00 per hour
Variable Overheads
X 7000 labour hours Rs. 7,000
Y 3000 labour hours Rs. 6,000
Z 1000 labour hours Rs. 4,000
Fixed overheads Rs. 30,000 for 7500 working hours. You are required to calculate the Cost of Job No. 323 and calculate the Price to give the profit of 33 on Selling Price. **(Unit-IV, Prob.27)**

OR

(b) From the following you are require prepare cost sheet

Opening stock of raw materials	22,000
Closing stock of raw materials	24,464
Opening stock of finished	17,600
Closing stock of finished	35,200
Opening work in progress	14,450
Closing work in progress	7,500
Material purchase	1,32,000
Closing inwards	5,000
D. Wages	1,10,000
Factory rent	44,000
Lighting, heating of factory	5,000

Office electricity	2,450
Office staff salary	10,000
Dep. on plant & machinery	3,300
Dep. on office furniture	5,400
Repairs to delivery van	2,000
Advertisement	10,000
Warehouse rent	7,500
Cost a/c salary	4,800
Chief a/c salary	2,200
Legal charges	4,000
Donations	4,500
Transfer fee	2,200
Sales	6,00,000

(Unit-IV, Prob.8)

13. (a) The following was the expenditure on contract No. 646 for 45,00,000 which started in January 2016.

	`
Materials	9,00,000
Wages	12,30,000
Plant	1,50,000
Direct charges	64,500

Cash received on account upto 31st December, amounted to ` 18,00,000 being 80% of the work certified. The value of materials on hand at 31st. December is ` 75,000. Prepare contract account. 10% depreciation on plant was to be charged. **(Unit-V, Prob.15)**

OR

(b) A product passes through three stages of production and the product of each stage becomes the raw materials of the next stage. Further raw materials are also added at each stage. During March 2014, 2000 units of finish product were produced with the following expenditure.

Particulars	Stage-A	Stage-B	Stage-C
Materials	20,000	16,000	8,000
Labour	16,000	24,000	12,000
Direct expenses	1,200	2,000	800

Indirect expenses amounted to ` 2,600. It is to be apportioned on the basis of labour. Main raw issued to stage (besides above) was worth ` 12,000. Prepare the process cost accounts. **(Unit-V, Prob.28)**