STUDY MATERIAL

SUBJECT : COST ACCOUNTING I
CLASS : B.com (CCF)
SEMESTER : II
UNIT : 3 and 4
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Labour: System of wage payment – Idle time – Control over idle time – Labour turnover. Overhead – Classification of overhead – allocation and absorption of overhead.

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LABOUR DIRECT LABOR

Direct labor is that labor which is directly engaged in the production of goods and services. The wages of such labor are known as direct wages. These labor cost or direct wages can be identified with and allocated to a particular product, process, or job. It is a part of the prime cost. Example: wages of spinners and weavers in a textile factory

INDIRECT LABOR

Indirect labor is that labor which is not directly engaged in production of goods or services. It indirectly helps the direct labor engaged in production. The wages paid for indirect labor is known as indirect wages. Indirect wages are those which cannot be identified with and allocated but can be apportioned to a particular product, process or job. Example: wages of supervisor, supervisors etc.,

LABOR TURNOVER

INTRODUCTION

Workers may come and go. This is a normal feature in every organization. However, higher level of labor shifting is not desirable for an organization. The movement of shifting into and out of the organization by employees is known as labor turnover.

MEANING

Labor turnover denotes the percentage of change in the labor force of an organization. High percentage denotes that labor is not stable.

CAUSES OF LABOR TURNOVER I. PERSONAL CAUSES

Workers may leave the organization on personal grounds. Examples: domestic troubles and family responsibilities, retirement due to old age, accident making workers permanently incapable of doing work, death, workers finding better jobs at some other places. In all such cases, labor turnover is unavoidable and the employer can do nothing to reduce the labor turnover.

II. UNAVOIDABLE CAUSES

In certain circumstances, it becomes necessary for the management to ask some of the workers to leave the organization. The circumstances may be:

i. Workers may be discharged due to their inefficiency.

ii. Workers may be discharged due to continuous or long absence. iii. Workers may be retrenched due to shortage of work.

III. AVOIDABLE CAUSES

The avoidable causes are low wages, job dissatisfaction, poor working conditions, unsuitable working hours, lack of job security, lack of proper training facilities, lack of promotion, unfair method of promotion, and unsympathetic attitude of management.

EFFECTS OF LABOR TURNOVER

A high rate of labor turnover results in loss of output and higher cost of production due to following reasons:

i. Frequent changes in labor force causes disturbance in the continuous flow of production. This leads to reduced output.
ii. Cost of selection and training of new workers increase the cost of production.
iii. Newly employed workers are likely to mishandle tools and machines results in break down which affects production.
iv. Inefficiency and inexperience of newly recruited workers lead to defective work and increase wastage in production.
v. Lack of cooperation and coordination between old and new workers resulting in fall in output and increased cost of production

COST OF LABOR TURNOVER

The effect of labor turnover when it is expressed in terms of money, it can be called as the cost of labor turnover the cost of labor turnover may be classified into preventive costs and replacement costs.

1. PREVENTIVE COSTS:

These are costs, which are incurred to prevent excessive labor turnover. The aim of these costs is to keep the workers satisfied so that they may not leave the job. These costs include: i. Cost of providing good working conditions.

ii. Cost of providing medical, housing and recreation. iii. Cost of providing educational facilities to the children of the employees. iv. Cost of providing subsidized meals.

v. Cost of providing benefits like gratuity, pension etc.

2. REPLACEMENT COSTS:

These costs include the following:

i. loss of output due to delay in recruiting new workers.

ii. Loss of output due to the inefficiency of new workers

iii. Cost of recruitment and training of new workers iv. Cost of tools and machine breakages. v. Cost of accidents. vi. Cost of supervision.

CONTROL OF EXCESSIVE LABOR TURNOVER

1. An adequate and satisfactory wage system should be adopted.
2. Better working conditions and welfare facilities should be provided.
3. Scientific method of recruitment, training and job placement should be introduced.
4. Job security and promotion opportunities must be provided.
5. Qualified personnel officers should be appointed for dealing with workers grievances.
6. Men management relationship should be improved encouraging labor participation in management.
7. Attractive pension and gratuity scheme should be introduced.
8. In order to encourage efficient workers, incentive schemes must be introduced.

METHODS OF MEASUREMENT OF LABOUR TURNOVER 1.

SEPARATION METHOD:

This is the most commonly used method. Under this method, labor turnover is measured by dividing the total number of separations during the period by the average number of workers on the payroll during the same period.

2. REPLACEMENT METHOD:

This method takes into account only the actual replacement of labor during the period irrespective of the number of workers leaving. While calculating the number of replacements, new workers employed because of expansion of business should not be taken.

3. FLUX METHOD:

This method is the combination of the above two methods.

FEATURES OF GOOD WAGE SYSTEM

There are two principal wage systems. They are a. Time wage system

b. Piece wage system

Under time wage system, the workers are paid on hourly, monthly, daily, weekly basis. It is not related to units produced but related to the hours worked.

Under piece rate system, the workers are paid for work performed.

FEATURES

1. It should guarantee minimum wage irrespective of the work done.
2. It should be based on scientific time and motion study.
3. It should enable efficient worker to earn more.
4. It should encourage productivity.
5. It should ensure equal pay for equal work.
6. It should be flexible.
7. It should reduce labor turnover.
8. It should be accepted by the trade unions.
9. It should not be in violation of the government policy.
10. It should be fair to both employee and employer.
11. It should minimize absenteeism.

TIME WAGE SYSTEM

Under this system, the worker is paid on hourly, daily, weekly or monthly basis. The payment is made according to the time worked irrespective of the quantity of the work done.

***Time Wages = Hours worked x rate per hour*.**

SUITABILITY OF THIS METHOD

1. Where quality of work is more important than the quantity of work.\
2. Where the work requires high degree of skill
3. Where the output of indirect workers cannot be measures
4. Where production involves delay and interruption due to unavoidable factors

MERITS

1. It is simple to understand and easy to operate.
2. Each worker is assured of minimum wages.
3. Standard of the quality is maintained.
4. It is preferred by trade unions.
5. There is no discrimination among workers.
6. Average and below average workers are benefited.

DEMERITS

1. Efficient and inefficient workers get the same wages.
2. Equality in wages to all will depress superior workers.
3. Labor cost cannot be estimated in advance. Therefore, it is difficult to submit tenders.
4. Slow workers go slow further leading to overtime.
5. Effective supervision is necessary in order to reduce idle time. This increases the cost of production.

PIECE RATE SYSTEM

It is also called payments by results method. Under this method, payment is made for the quantity of work done rather than the time spent on the jobs. Earnings under piece rate are calculated as follows: ***Piece Wages = No. of units produced x Rate per unit.***

SUITABILITY

1. Quality of work is not important.
2. Work is of repetitive nature.
3. Quantity of work can be measured.
4. Where it is not possible to control effectively the wasting of time by workers

MERITS

1. This system is simple to understand and easy to operate.
2. No payment is made for idle time.
3. It requires less supervision.
4. It gives encouragement for higher production by rewarding efficient workers.
5. Increased volume of production reduces cost per unit.

DEMERITS

1. Fixation of satisfactory piece rate is a difficult task.
2. It does not assure minimum wages.

3. Inefficient workers are penalized.
4. Increase in production is likely to affect the quality of work.
5. High speed of work is injurious to the health of the workers.
6. It cannot be adopted in cases where work is measurable.

DIFFERENCE BETWEEN TIME AND PIECE RATE SYSTEM

TIME RATE SYSTEM	**PIECE RATE SYSTEM**
Minimum wages are not guaranteed	Minimum wages are guaranteed
It is suitable to learners and beginners	It is not suitable for learners and beginners
This pertains to hours of work	This pertains to output
Cost reduction is not possible	Cost reduction is possible
Individual efficiency is not accounted for	Individual efficiency is measured and accounted
Idle time is also paid	Idle time is not paid
Quality of work is more important than the quantity	Quantity is given more importance
Inefficiency is not penalized	Inefficiency is penalized

INCENTIVE WAGE PLAN

An incentive may be defined as a benefit either monetary or otherwise offered to stimulate effort. An incentive may be either monetary or non monetary. It may be given either individually or collectively. The main object is to induce the worker to produce more and to earn more.

INCENTIVES SCHEMES HALSEY

PLAN:

This plan was introduced by F.A. Taylor, an American engineer. Under this plan, an hourly rate is guaranteed. A standard time is set for each job. The worker is paid for the hours worked at the agreed rate plus bonus depending on time saved. The bonus is 50% of time saved. **Formula**:

Hours worked X Rate per hour + 50% of (Time saved x rate per hour). **MERITS**

1. It is simple to understand and easy to calculate.
2. It guarantees time wages.
3. Both employer and employees get equal benefit from the time saved by workers.
4. Savings in time reduce both labor cost and overhead expenses.
5. The inefficient worker is not penalized.

For efficient worker, this plan is more profitable than the time wage system.

DEMERITS

1. Fixation of standard time is very difficult.
2. At higher level of efficiency, the earnings are reduced.

ROWAN PLAN:

This plan was introduced in the year 1901 by David Rowan. Under this plan, time rate is guaranteed. The worker is paid for the hours worked at an agreed hourly rate plus bonus depending upon the time saved. Here, bonus payable is not a fixed percentage but payable in proportion of time saved which time taken bears to the standard time.

FORUMLA:

Hours worked X Rate per hour + Time Taken Time allowed X Time saved X Rate per hour. **MERITS**

1. It guarantees time wages.
2. It pays higher bonus to workers when compared with Halsey plan.

3. The employer is protected even if there is an error in fixing standard.

DEMERITS

1. Workers find it difficult to understand and calculate wages.
2. It time saved is more than half of the standard time, the total earnings starts decreasing. This affects extra ordinary efficiency.

TAYLORS DIFFERENTIAL PIECE RATE SYSTEM**:**

F.W. Taylor, the father of Scientific Management introduced this system. Under this system, minimum time rate is not guaranteed. It provides two piece rate, a low piece rate for output below standard and high piece rate for output above standard.

MERITS

1. It is simple to understand and easy to operate.
2. It attracts efficient workers.
3. It helps employer much in increasing production by offering higher rates to efficient workers.
4. As the production increases, cost per unit of production decreases.

DEMERITS

1. It does not guarantee minimum wages.
2. It penalizes inefficient workers.
3. It creates disparity among workers and may weaken their unity.

IDLE TIME INTRODUCTION

Idle time may be defined as the difference between the time for which the workers are paid and the time that they actually spend on production. It is the time for which payment is made even without any production was carried out. Idle time arises only when the wages are paid on time basis and not on piece rate basis.

CAUSES FOR IDLE TIME

Idle time may arise due to waiting for job, waiting for instructions, waiting for materials, power failure, machinery break down, time taken for machine settings and adjustments etc.,

TYPES OF IDLE TIME

Idle time is of two types. They are

1. Normal Idle Time
2. Abnormal Idle Time

1. NORMAL IDLE TIME:

Normal idle time is a wasted time, which cannot be avoided and is bound to arise. It is regular and uncontrollable.

EXAMPLE: Time taken to reach the place of work from factory gate, time taken for machine setting and adjustments, time taken for tea break and power failure.

2. ABNORMAL IDLE TIME:

Abnormal idle time is wasted time, which can be avoided and controlled.

EXAMPLE: The time wasted due to break down of machinery on account of the inefficiency of the works engineer, the time wasted on account of the failure of the power supply, the time wasted due to unnecessary waiting for instructions, the time wasted due to unnecessary waiting for tools and raw materials and the time wasted due to strikes etc.

TREATMENT OF IDLE TIME COST OF NORMAL IDLE TIME

1. The labor cost of normal idle time may be treated as an item of factory expenses and recovered as an indirect charge.
2. It may be charged direct to production at a grossed up rate to include normal idle time.

COST OF ABNORMAL IDLE TIME

It is a principle of costing that not all abnormal expenses and losses should be included in costs and as such, wages paid for abnormal idle time should not form part of cost of production. The wages paid for abnormal idle

time should not form part of cost of production and so debited to costing profit and loss. The main objective of transferring to costing profit and loss is to have a meaningful comparison of cost of production at different times by keeping away abnormal wages from cost of production. It is to be noted that idle time can be isolated only in case of direct workers. In case of indirect or non-productive workers i.e. fitter, ward staff etc., the whole of their wages will be shown as indirect expenses and so wages for idle time will be absorbed automatically. **CONTROL OF IDLE TIME**

Production should be planned and supervised so that idle time can be reduced to a minimum, all the jobs in hand should be properly planned so that the workers may complete them in sequence and may not have to wait for getting the work.

OVERTIME

Overtime is a time worked beyond normal working hours. If a worker works more that 9 hours on any day or 48 hours in a week, the worker is entitled to overtime payment. According to the Factories Act 1948, the amount paid for overtime is double the normal rate of wages. If the Factories Act does not apply, Establishment Act will apply. According to this act, overtime has to be paid at 11/2 times the normal rate of wages. The excess paid over usual normal rate is called overtime premium.

Overtime work should be avoided as far as possible due to the following reasons:

1. Overtime leads to excessive labor cost and will reduce profit.
2. It leads to unusual strain on plant and machinery.
3. Expenses like lighting, cost of supervision etc will also increase considerably.
4. Workers start doing regular work slow to secure overtime work.
5. Quality suffers because workers are tired.

Overtime may arise in the department due to any one of the following reasons:

1. To complete the work within a specified time
2. To make up any shortfall in production due to break down of machinery of power supply
3. To make up any shortfall in production caused by abnormal circumstances such as fire, flood, strike etc.,
4. To increase the production to meet the huge demand for the product in the market

CONTROL OF OVERTIME

The following steps may be taken to control overtime work.

1. All the overtime work should be duly authorized by the works manager in advance.
2. Overtime cost should be recorded separately for the purpose of cost control and cost planning.
3. If overtime is due to lack of machines, steps may be taken to install more machines.
4. There must be proper flow of work to the workers, so that their time is not lost.
5. There must be proper instructions to the workers, so that they need not wait for instructions.
6. Regular maintenance of plant, regular supply of raw materials of standard quality has a good effect in reducing the waste of time or idle time.

OVERHEAD DEFINITION

Overhead is defined as," the aggregate of indirect material cost, indirect wages and indirect expenses. The term indirect means that which cannot be allocated, but which can be apportioned to, absorbed by cost units, or cost centers. Therefore, overhead refers to those expenses, which cannot be identified with particular products, process or jobs.

CLASSIFICATION OF OVERHEADS

Classification is the process of grouping of costs according to their common characteristics. Classification of overhead is important in order to identify costs with cost units or cost centers. There are various methods for the classification of overhead. The method to be adopted depends upon the type of business, nature of product or services rendered and policy of management. Overheads may be classified in the following ways.

1. CLASSIFICATION ACCORDING TO NATURE

i. Indirect Materials:

Indirect materials are those materials, which do not form a part of the finished product. Cost of indirect materials cannot be identified with and allocated but can be apportioned to a particular product, process or job. Example: Cotton waste, lubricant, grease etc., **ii. Indirect Labour**:

Indirect labor is that labour which is not directly engaged in production of goods or services. It indirectly helps the direct labour engaged in production. The wages paid for indirect labour is known as indirect wages. Indirect

wages are those which cannot be identified with and allocated but can be apportioned to a particular product, process or job. Example: Wages of mechanics, supervisors, security guard etc., **iii. Indirect Expenses**:

Expenses (other than indirect material and indirect labour) that are not directly charged to production are indirect expenses. Example: Office expenses and selling and distribution expense

2. CLASSIFICATION ACCORDING TO FUNCTIONS

i. Factory Overheads:

These are also called as Manufacturing overheads, works overhead or factory on cost. Factory overheads cover all expenses incurred from the stage of raw materials to finished goods. It includes indirect material, indirect lab our and indirect expenses in producing an article. Example: factory rent, supervisor's salary, power and fuel, heating and lighting etc., **ii. Administrative Overheads**:

These are expenses incurred for running the administrative office. Example: Office rent and salaries, printing and stationery, telephone expenses etc., **iii. Selling Overheads**:

These are expenses incurred for actual sales and promotion of sales. Examples: salaries of sales manager, commission, traveling expenses etc., **iv. Distribution Overheads**:

These are expenses concerned with packing and delivery of goods to the customer. Example: packing charges, warehouse expenses etc.,

3. CLASSIFICATION ACCORDING TO VARIABILITY

i. Fixed Overheads:

Expenses that do not vary with the volume of production are known as fixed overheads. Examples salaries, rent, insurance etc., **ii. Variable Overheads**:

Expenses that vary with the volume of production are known as variable overheads. These are direct costs. Examples material, wages, selling commission etc., **iii. Semi Variable Overheads**:

Expenses that are partly fixed and partly variable are called semi variable overheads. These expenses do not vary in the same ration in which the output changes.

4. CLASSIFICATION ACCORDING TO NORMALITY

i. Normal Overheads:

Normal overheads refer to such overheads, which are expected to incur in attaining a given output. These overheads are unavoidable. They are, therefore, included in production costs. **ii. Abnormal Overheads**:

Abnormal overheads refer to such overheads, which are not expected to incur in attaining a given output. Such overhead costs are charged to costing profit and loss account. Example: cost of abnormal idle time, abnormal wastage etc.

5. CLASSIFICATION ACCORDING TO CONTROLLABILITY

i. Controllable Overheads:

Controllable costs are variable costs, which can be controlled. Examples cost of power used in a particular department is controllable by the departmental manager. **ii. Un Controllable Overheads**:

Uncontrollable costs are fixed costs, which cannot be controlled. Examples rent, salaries. These expenses are incurred on time basis.

ALLOCATION

Allocation is defined as the allotment of whole item of cost-to-cost centers or cost units. In other words, it is the process of charging the full amount of overhead without division to a particular department or cost centers. Examples salary of sales manager is allocated to sales department. Similarly, overtime premium of a particular department can be allocated to that department.

APPORTIONMENT

Apportionment is defined as the allotment of proportions of cost center or cost units. In other words, it is the process of distribution of overheads to various departments or cost centers on some equitable basis. Example factory rent is an expense, which cannot be allocated to any one department but is to be shared by all production departments based on floor areas.

DIFFERENCES

1. Allocation means the allotment of whole item of cost-to-cost center or cost units. Apportionment means the allotment of proportions of cost-to-cost centers or cost units.
2. Expenses that can be directly identified with a particular department or cost centers is called allocation. On the other hand, expense that cannot be directly identified with a particular department or cost centers is called apportionment.

3. Allocation is much wider than apportionment.

BASES OF APPORTIONMENT

The main bases of overhead apportionment utilized are as follows:

1. Direct Allocation:

Overheads are directly allocated to various departments based on expenses for each department. Example: Overtime wages, Power etc.

2. Direct Labor Hours:

Under this basis, the overhead expenses are distributed to various departments in the ratio of total labor worked in each department. Example: Salary of the Supervisor **3. Direct Wages**:

According to this basis, expenses are distributed amongst the departments in the ratio of direct wages. This method is used only for those items of expenses, which are booked with the amount of wages. Example: P.F. Contribution, Workmen Compensation

4. Number of Workers:

Under this, total number of workers in each department is taken as the base for apportionment of overhead among departments. **5. Relative areas of departments**:

This basis is adopted for the apportionment of certain expenses like lighting, heating, rent, rates and taxes on building etc.

6. Capital Values:

In this method, the capital values of certain assets like plant and building are used as a basis for the apportionment of certain expenses. Examples: Rates, taxes, depreciation, insurance charges on the building etc., **7. Light Points**:

This method is used for apportioning lighting expenses.

8. Kilowatt Hours:

This basis is used for the apportionment of power expenses.

9. Technical estimates:

This base is used for the apportionment of those expenses for which it is difficult to find out any other basis of apportionment. Examples: works manager salary, internal transport, steam, water etc.

COST CLASSIFICATION

Cost classification is the process of grouping of costs according to their common characteristics. Classification of overhead is important in order to identify costs with cost units or cost centers. There are various methods of classification of overheads. The method to be adopted depends upon the type and size of business, nature of product or service rendered and policy of the management. Cost may be classified according to their function, variability, normality and controllability.

VARIOUS COSTS FIXED COST

Fixed costs are commonly described as those, which remain fixed in total amount with the increase or decrease in the volume of output for a given period of time. Fixed cost per unit decreases as production increases and increases as production declines. These costs are known as period costs because these are dependent on time rather than an output. Example: Rent, insurance of factory building, factory manager's salary

VARIABLE COST

Variable Costs are those, which vary in total in direct proportion to the volume of output. These costs per unit remain relatively constant with changes in production. The variable cost fluctuates in total amount but tend to remain constant per unit. Example: direct material, direct labor, power, repairs etc.,

SEMI VARIABLE COST

These costs are those, which are partly fixed and partly variable. Examples: Telephone expenses include a fixed portion of annual charges plus variable charges according to calls. Thus total telephone expenses are semi variable.

UNDER ABSORPTION AND OVER ABSORPTION OF OVERHEADS

LABOUR TURNOVER PROBLEM: 1

From the following information, calculate the labor turnover rate and labor flux rate

Number of workers at the beginning of the year 3,800

Number of workers at the end of the year 4,200

During the year 40 workers, leave while 160 workers are discharged 600 workers are required during the year, of these, 150 workers are recruited because of leavers and the rest are engaged in accordance with an expansion scheme.

PROBLEM: 2

From the following particulars supplied by the personnel department of a firm, calculate the labor turnover.

Total number of employees at the beginning of the month 2,010

Total number of employees who are recruited during the month 30

Number of employees who left during the month 50

Total number of employees at the end of the month 1,990

PROBLEM: 3

The personnel department of a concern gives you the following information in respect of labor.

No. of employees on 1st Jan 1800 No.

of employees on 31st Jan 2200.

During the month 20 persons quit and 80 persons are terminated. 300 workers are needed. Of these, 50 workers are recruited in the vacancies and the rest were engaged in the expansion scheme. Calculate the labor turnover ratio.

PROBLEM: 4

From the following information calculate the labor turnover ratio

No. of workers at the beginning of the month 900 No. of

workers at the end of the month 1,100.

During the month, 10 workers left, 40 persons were discharged and 150 workers are recruited. Of these, 25 workers are recruited in the vacancies of those leaving, while the rest were engaged for an expansion schemes.

PROBLEM: 5

From the following particulars, prepare a statement showing the labor cost sheet showing labor cost per day.

Monthly salary Rs. 225

Leave Salary 5% of 1

Employer's contribution to Provident Fund 81/3% of 1 and 2.

Employer's contribution to ESI 3% of 1 and 2.

Pro rata expenditure on amenities to labor Rs. 28 per head per month.

PROBLEM: 6

From the following data prepare a statement showing the cost per man day of 8 hours.

Basic salary and D.A. Rs. 300 per month.

Leave Salary to the work man 6% of the basic and D.A.

Employer contribution to P.F. 6% of 1 plus 2.

PROBLEM: 7

From the following data prepare the statement showing the cost per man day of eight hour.

Basic salary and D.A. Rs. 300 p.m.

Leave salary to the workman 6% of the basic and D.A.

Employer's contribution to P.F. 6% of 1 and 2.

Employees contribution to P.F. 6% of 1 and 2.

Pro rata expenditure on amenities to labor Rs. 25 per head per month.

Number of working hours in a month 200.

PROBLEM: 8

From the following data, prepare a statement showing the cost per day of 8 hours of engaging a particular type of labor:

Monthly salary (basis plus dearness allowance) Rs.1,400.

Employer's contribution to provident fund : 8% of salary 1 and 3.

Leave Salary payable to workmen 51%.

Employer's contribution to ESI 21/2% of salary (1 and 3).

Pro rata expenditure on amenities to labor Rs. 20 per head per month.

No. of working labor hours in a month 200.

9.From the particulars given below, prepare labor cost per man-day of 8 hours:

1. Basic salary Rs. 2 per day
2. Dearness Allowance: 25 paise per every point over 100 cost of living index for working class Current cost of living index 700 points.
3. Leave Salary: 10% of 1 and 2.

4. Employer contribution to P.F. 8% of 1,2, and 3.
5. Employer's contribution to state insurance: 2.5% of 1,2 and 3.
6. Expenditure on amenities to labour: Rs. 20 per head per mensem

Number of working days in a month 25 days of 8 hours each.

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HALSEY PREMIUM PLAN

PROBLEM: 4

From following, calculate the wages under Halsey and Rowan system. Time allowed 40 hours, Time taken 30 hours, Rate per hour Re. 1.

PROBLEM: 5

Calculate the earnings of a worker under Halsey premium plan.
Time allowed 48 hours, Time taken 40 hours, rate per hour Rs. 10.

PROBLEM: 6

A worker is paid at Re.1 per hour for completing a work within 8 hours. If he completes the work within 6 hours, calculate his wages for 6 hours and 8 hours under Halsey plan when the rate of premium is 50%. 7. Calculate the earnings of a worker under halsey weir plan Time allowed 48 hours, time taken 40 hours, rate per hour Rs.10.

8.

Calculate the wages under Rowan plan with the following data:
Standard time 9 hours, time taken 6 hours, normal rate Rs. 8 per hour, Material cost Rs. 40, overhead recovered 150% of direct wages. Find out the total cost also.

9.

Calculate the total earnings and the rate earned per hour of three workmen under the Halsey and Rowan plans, the bonus under Halsey plan is 50% of the time saved. Standard time 20 hours, hourly rate of wages Rs.4, Time taken by A 16 hours, B 10 hours and C 8 hours.

PROBLEM: 10

The following particulars apply to a job
Standard time 10 hours, time taken 8 hours, time rate Rs.2 per hour. Calculate the earnings under Rowan Plan.

PROBLEM: 11

Standard time allotted for a job is 20 hours and the rate per hour is Rs. 2 plus a dearness allowance @ 50 paise per hour worked. The actual time taken by a worker is 15 hours. Calculate the earnings under a. Time system, b. Piece wage system, c. Halsey plan and d. Rowan scheme.

PROBLEM: 12

For a certain work order, the standard time is 20 hours, wages Rs. 5 per hour, the actual time taken is 13 hours and the factory overhead charges are 80%of standard time. Set out a comparative statement showing the effect on paying wages on the halsey and rowan incentive bonus system.

PROBLEM: 13

A worker completes a job in a certain number of hours. The standard time allowed for the job is 10 hours and the hourly rate of wages is Re. 1. The worker earns at 50% rate a bonus of Rs.2 under Halsey Plan. Find out his total earnings under the Rowan plan.

PROBLEM: 14

A worker completes a job in a certain number of hours. The standard time allowed for the job is 10 hours and the hourly rate of wages is Re.1. The worker earns at 50% rate as bonus of Rs.2 under halsey plan. Calculate the earnings under Rowan plan.

HALSEY AND ROWAN PLAN

PROBLEM: 1

From the following particulars, work out the total amount payable to three workers and the rate earned per hour by them under Halsey and Rowan premium bonus scheme. Standard time allowed 12 hours, Actual time taken by A 8 hours, B 6 hours and C 4 hours.

PROBLEM: 2

Calculate the earnings of a worker under the Rowan plan and Halsey Weir bonus system (50% to worker) from the following particulars.
Hourly rate of wages guaranteed Re.1
Standard time for producing one dozen articles 5 hours.
Actual time taken by the worker to produce 20 dozen 80 hours.

PROBLEM: 3

Calculate the earnings of a worker under Rowan plan and halsey weir plan (40% to worker) form the following particulars. Hourly rate of wages (guaranteed) 0.75 paise, standard time for producing 1 dozen article is 3 hours. Actual time taken by the worker to produce 20 dozen articles is 48 hours.

PROBLEM: 4

Calculate the earnings of a worker under the time rate, piece rate, halsey and rowan plan

Standard time 30 hours, time taken 20 hours, hourly rate of wages is Re.1 per hour plus dearness allowance at 50 paise per hour worked.

PROBLEM: 5

A worker takes 80 hours to do a job for which the time allowed is 100 hours. His daily rate is Rs.2.50 per hour. Calculate the work cost of the job under the following methods of payment of wages: time wages, piece rate, halsey plan and rowan pan. Material cost Rs.120 and factory overhead 125% of wages.

TAYLOR'S PIECE RATE SYSTEM

PROBLEM: 1

ON the basis of the following information calculate the earnings of X and Y under the Straight piece rate system and Taylor's Differential Piece rate system.

Standard Production 10 units per hour.

Normal time rate Rs. 5 per hour.

Differential piece rate to be applied

80% of piece rate for below standard performance.

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

Actual performance:

X produced 80 units in a day of 10 hours. Y produced 110 units in a day of 10 hours.

PROBLEM: 2

With the help of the following information ascertain the wages paid to workers Ram and Shyam under Taylor's differential Piece rate system.

Standard time allowed 40 units per hour.

Normal time rate Rs.4 per hour.

Differential to be applied;

75% of piece rate when below standard.

125% of piece rate when at or above standard.

In a day of 8 hours, the workers have produced as follows: Ram 280 units and Shyam 400 units.

PROBLEM: 3

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

Normal rate per hour Rs.18

Standard time per unit 20 seconds.

Differentials to be applied:

80% of piece rate below standard.

120% of piece rate at or above standard.

Worker A produces 1,400 units per day and worker B produces 1,500 units per day of 8 hours.

PROBLEM: 4

Using Taylor's differential piece rate system find out the earnings of the worker from the following data: Standard time per piece 20 minutes.

Normal rate per hour Rs.1.50

In a day of 9 hours, X produces 25 units and Y produce 30 units.

Worker A 360 units, B 420 units C 540 units.

METHOD: I PRIMARY DISTRIBUTION SUMMARY PROBLEM: 1

Shiva industries limited has four departments A,B and C are production department and D is the service department. The actual expenses were as follows:

Rent Rs.6,000, Repairs to plant Rs.3,600, Depreciation Rs.2,700, lighting charges Rs.600, supervision Rs.9,000, insurance of stock Rs.3,000, power Rs.5,400 and employees insurance liability Rs.900. The following information is also available:

Particulars	A	B	C	D
Area Sq. ft.	300	220	180	100
No. of workers	48	32	24	16
Total wages	8,000	6,000	4,000	2,000
Value of Plant	24,000	18,000	12,000	6,000
Value of Stock	15,000	9,000	6,000	---

Apportion the costs to four departments on the most equitable basis.

PROBLEM: 2

The modern company is divided into four departments P1, P2, P3 are producing departments and S1 is a service department.

Rent Rs.1,000, repairs to plant Rs.600, depreciation of plant Rs.450, employer's liability for insurance Rs.150, supervision Rs1,500, fire insurance in respect of stock Rs.500, power Rs.900 and light Rs.120. The following information is available in respect of the four departments.

Particulars	P1	P2	S1	S2
Area Sq. ft.	1,500	1,100	900	500
No. of workers	20	15	10	5
Total wages	6,000	4,000	3,000	2,000
Value of Plant	24,000	18,000	12,000	6,000
Value of Stock	15,000	9,000	6,000	--
H.P. of plant	24	18	12	6

Apportion the costs to the various departments on the most equitable basis.

PROBLEM: 3

Amit and company has five departments P, N, R, S are the producing departments and T is a service departments. The actual costs for a period are as follows

Repairs Rs.2,000, rent Rs.2,500, depreciation Rs.1,200, supervision Rs.4,000, insurance Rs.1,500, employer's liability of employees insurance Rs.600 and light Rs.1,800

The following information is also available in respect of the five departments.

Particulars	P	N	R	S	T
Area Sq. ft.	140	120	110	90	40
No. of workers	25	20	10	10	5
Total wages	10,000	8,000	5,000	5,000	2,000
Value of Plant	20,000	18,000	16,000	16,000	6,000
Value of Stock	15,000	10,000	5,000	5,000	--

Apportion the costs to the various departments on the equitable basis.

PROBLEM: 4

Apportion the overhead among the department A, B, C and D on the most equitable method: Rent 2,000; Repairs 1,200; Depreciation 900; light 200; supervision 3,000; insurance 1,000; Employer's liability insurance 300; power 1,800

The following data are also available in respect of four departments:

Particulars	A	B	C	D
Area Sq. ft.	150	110	90	50
No. of workers	24	16	12	8
Total wages	8,000	6,000	4,000	2,000
Value of Plant	24,000	18,000	12,000	6,000
Value of Stock	15,000	9,000	6,000	---
H.P. Power	150	100	75	50

PROBLEM: 5

K limited has three production departments A, B and C and two service departments D and E. The following records are extracted from the records of the company.

Particulars	Total	A	B	C	D	E
Floor Space	10,000	2,000	2,500	3,000	2,000	500
Light Points	60	10	15	20	10	5
Direct Wages	10,000	3,000	2,000	3,000	1,500	500
H.P. of Machine	150	60	30	50	10	--
Value of Machine	2,50,000	60,000	80,000	1,00,000	5,000	5,000

The expenses are:

Rent and rates Rs.5,000
Indirect wages Rs.1,500
Depreciation on machines
Rs.10,000
General lighting Rs.600
Power Rs.1,500
Sundries Rs.10,000.

Apportion the cost to various departments of the most equitable basis by preparing a primary distribution summary.

PROBLEM: 6

Apportion the following expenses between department A and B

Rent and rates Rs.360
Stores expenses Rs. 742
General factory labour Rs. 1,284
Holiday pay Rs. 520
Insurance Rs. 130
Fire Insurance Rs.260
Depreciation Rs. 906
Plant repairs Rs.450.

Information regarding the departments available:

Particulars	A	B
Floor Space	60 x 115	45 x 100
No. of employees	18	42
Annual direct wages	5,000	6,000
Annual direct labour hours	36,000	92,500
Plant value	10,000	2,500

METHOD II SECONDARY DISTRIBUTION

PROBLEM: 7

The following data were obtained from the books of Arun engineering company for the half year ended 30th September. Prepare an overhead distribution summary and compute the departmental overhead rate for each of the production departments assuming that overheads are recovered as a percentage of direct wages.

Particulars	Production Departments			Service Departments	
	A	B	C	X	Y
Direct Wages	7,000	6,000	5,000	1,000	1,000
Direct Material	3,000	2,500	2,000	1,500	1,000
No. of Workers	200	150	150	50	50
Electricity KWH	8,000	6,000	6,000	2,000	3,000
Light points No.s	10	15	15	5	5
Asset values	50,000	30,000	20,000	10,000	10,000
Areas occupied Sq.ft.	800	600	600	200	200

The expenses during the period were: stores overhead Rs.400, motive power Rs.1,500, lighting Rs.200, labour welfare Rs.3,000, depreciation Rs.6,000, repairs and maintenance Rs.1,200, general overheads Rs.10,000, rent and taxes Rs.600.

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

PROBLEM: 8

In a light engineering factory, the following particulars have been collected for the three months period ended 31st March 1998. You are required to re apportion the service department's expenses to production departments.

Expenses as per primary distribution summary

PRODUCTION DEPARTMENT

P1 Rs.8,850

P2 Rs.7,165

P3 Rs.6,285

SERVICE DEPARTMENT

S1 Rs.4,515 S2

Rs.6,010.

Apportion the expenses of service department S2 in the proportion of 3:3:4 and those of service department S1 in the ratio of 3:1:1 to departments P1, P2 and P3 respectively.

DIRECT REDISTRIBUTION METHOD PROBLEM: 9

K limited had three production departments and four service departments. The expenses of these departments as per primary distribution summary were:

Production Department: J Rs.15,000; K Rs.13,000 and L Rs.12,000.

Service Department: Stores Rs.2,000, Time keeping Rs.1,500, power Rs.800 and canteen Rs.500. The following additional information is available in respect of production departments.

Particulars	J	K	L
Horse power of machines	300	300	200
No. of workers	20	15	15
Value of stores used	5,000	3,000	2,000

Apportion the costs of the service departments to the production departments on an appropriate basis.

PROBLEM: 10

Small company limited has three production departments and four service departments. The expenses for these departments as per primary distribution summary were:

PRODUCTION DEPARTMENT

A Rs.30,000, B Rs.26,000 and C Rs.24,000

SERVICE DEPARTMENT

Stores Rs.4,000, Time keeping and Accounts Rs.3,000, Power Rs.1,600 and Canteen Rs.1,000.

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

Particulars	A	B	C
Horse power of machines	600	600	400
No. of workers	40	30	30
Value of stores used	5,000	3,000	2,000

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

METHOD II STEP METHOD PROBLEM: 11

Bombay industries have two production departments and three service departments. The total overheads of the departments are:

PRODUCTION DEPARTMENTS:

A Rs.24,000, B Rs.16,000.

SERVICE DEPARTMENT

TIME OFFICE Rs.8,000

STORES Rs.10,000 MAINTENANCE

Rs.6,000

Details relating to the departments are:

Particulars	Time Office	Stores	Maintenance	A	B

No. of workers	7	20	10	40	30
No. of stores requisition	-	-	6	24	20
Machine hours	-	-	-	2,400	1,600

Prepare the overhead distribution summary by Step Method.

PROBLEM: 12

A manufacturing company has two production departments X and Y, and three service departments Time keeping, stores and maintenance. The departmental distribution summary showed the following expenses for 1986 January.

PRODUCTION DEPARTMENT

X Rs.36,000 and Y Rs.24,000.

SERVICE DEPARTMENT

STORES Rs.7,500, TIME KEEPING Rs.6,000 and MAINTENANCE Rs.4,500.

Other information relating to these departments were:

Particulars	X	Y	Stores	Time Office	Maintenance
No. of workers	20	15	10	-	5
No. of stores requisition	24	20	-	-	6
Machine hours	1,800	1,200	-	-	-

Apportion the costs of the service departments to production departments X and Y.

PROBLEM: 13

A manufacturing company has two production departments P1 and P2 and three service departments Time keeping, stores and maintenance. The departmental summary showed the following expenses for the july 1998.

PRODUCTION DEPARTMENT

P1 Rs.16,000

P2 Rs.10,000

SERVICE DEPARTMENT

TIME KEEPING (S1) Rs.4,000 STORES

(S2) Rs.5,000

MAINTENANCE (S3) Rs.3,000

The other information relating to departments were:

Particulars	S1	S2	S3	P1	P2
No. of workers	-	20	10	40	30
No. of stores requisition	-	-	6	24	20
Machine hours	-	-	-	2,400	1,600

METHOD III REPEATED DISTRIBUTION METHOD PROBLEM: 14

You are supplied with the following information. Calculate the overhead hourly rate in respect of production departments A, B and C.

The primary overheads are:

PRODUCTION DEPARTMENT	Rs.
A	7,810
B	12,543
C	4,547
SERVICE DEPARTMENT	Rs.
X	4,000
Y	2,600

Expenses of service department X and Y are apportioned as under:

Particulars	A	B	C	X	Y
X	30%	40%	20%	-	10%
Y	10%	20%	50%	20%	-

Estimated working hours are A 1,000, B 2,500 AND C 1,400.

PROBLEM: 15

Cauvery limited has three production departments namely X, Y and Z and two service departments A and B. The following figures are extracted from the records of the company.

Rent and rates Rs.10,000, lighting and electricity Rs.1,200, indirect wages Rs.6,000, power Rs.3,000, depreciation of machinery Rs.20,000 and other expenses and sundries Rs.20,000. Following additional information is also available:

Particulars	X	Y	Z	A	B
Floor area (Sq. ft.)	2,000	2,500	3,000	2,000	500
No. of light points	20	30	40	20	10
Direct wages	6,000	4,000	6,000	3,000	1,000
Horse power of Machine	120	60	100	20	-
Cost of Machinery	24,000	32,000	40,000	2,000	2,000
Working hours	4,938	3,150	3,190	-	-

The expenses of the service departments S and T are to be apportioned as follows:

Particulars	X	Y	Z	A	B
A	20%	30%	40%	-	10%
B	40%	20%	30%	10%	-

Calculate the overhead absorption rate per hour in respect of the production departments. What will be the total cost of an article with material cost of Rs.90 and labour cost of Rs.52 which passes through the X, Y and Z for 2, 3 and 4 hours respectively.

PROBLEM: 16

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

Power Rs.2,400, rent Rs.4,200, canteen Rs.3,000, fire precaution service Rs.1,200, insurance on assets Rs.1,000, depreciation (10% of capital value), personnel department Rs.3,000, time office Rs.1,000 and maintenance of buildings Rs.2,400. The following data is also available:

Particulars	A	B	C	X	Y
Area Sq. mts.	400	400	300	200	100
KWH	2,000	2,200	800	750	250
No. of Workers	90	120	30	40	20
Capital Value (assets in lakhs)	0.50	0.60	0.40	0.30	0.20

The services of X and Y departments are used by the other departments in the following proportions.

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

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

PROBLEM: 17

The following particulars relate to a manufacturing company, which has three production departments A, B and C and two service departments X and Y.

Particulars	A	B	C	X	Y
Total Departmental Overhead as per Primary Distribution Summary	6,300	7,400	2,800	4,500	2,000

The company decided to charge the service department cost based on the following percentage:

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

Find out the total overheads of production departments charging service departmental costs to production on the repeated distribution method.

PROBLEM: 18

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

Particulars	Total	Production			Service	
		A	B	C	P	Q

Rent	12,000	2,400	4,800	2,000	2,000	800
Electricity	4,000	800	2,000	500	400	300
Indirect labour	6,000	1,200	2,000	1,000	800	1,000
Depreciation	5,000	2,500	1,600	200	500	200
Sundries	4,500	910	2,143	847	300	300
Estimated working hours		1,000	2,500	1,400		

Expenses of service departments P and Q are apportioned

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

METHOD III SIMULTANEOUS EQUATION METHOD PROBLEM: 19

The following is the departmental distribution summary of Ganesh Industries.

PRODUCTION DEPARTMENT

X Rs. 3,000

Y Rs.2,000 Z Rs.1,000.

SERVICE DEPARTMENT

A Rs.234 B Rs.300 The expenses of the service department are charged out on a percentage basis as shown below:

Particulars	X	Y	Z	A	B
A	20%	40%	30%	-	10%
B	40%	20%	20%	20%	-

Prepare statement showing the apportionment of service department expenses to production departments by adopting simultaneous equation method.

PROBLEM: 20

A company has three production departments and two service departments and for a period, the departmental distribution summary has the following totals:

PRODUCTION DEPARTMENTS

P1 800, P2 700 and P3 500

SERVICE DEPARTMENTS

S1 234 AND S2 300.

The expenses of the service departments are charged out on a percentage basis as follows:

Particulars	P1	P2	P3	S1	S2
S1	20%	40%	30%	-	10%
S2	40%	20%	20%	20%	-

Prepare a statement showing the apportionments of two service departments' expenses to production department on simultaneous equation method.