MARUDHAR KESARI JAIN COLLEGE FOR WOMEN (AUTONOMOUS)
PG and Research Department of Commerce

Core Course – Cost Accounting-I	**23UCM 51**
Labour Costing Direct Labour and Indirect Labour – Time Keeping – Methods and Calculation of Wage Payments – Time Wages – Piece Wages – Incentives – Different Methods of Incentive Payments - Idle time– Overtime – Labour Turnover - Meaning, Causes and Measurement.	
Learning Objectives : To familiarize with the different methods of calculating labour cost.	
Course Outcome : Examine the different methods of calculating labour cost.	

LABOUR

Labour represents human contribution to production and is second important element of cost Definition: Direct Labour is that ―which can be identified with and alloca to cost centres or cost unit‖. I.C.M A., London. ―Direct Labour is all labour expended in altering the construction, composition or condition of the product‖. - Wheldon Indirect labour is of general character and cannot be conveniently identified with a particular cost unit. It helps and facilitates production indirectly. Examples are foreman, supervisor, cleaner, inspector; clerk, etc.

Types of Labour: 1) Direct Labour 2) Indirect Labour

1) **Direct Labour**: Direct Labour is that, "Which can be identified with and allocated to cost centres or cost units. Thus Direct labour is engaged in converting rawmaterials into finished goods, (e.g) machine operator, shoemaker, tailor.

2) **Indirect labour**: are those labour which cannot be conveniently identified with a particular cost unit. (e.g) supervisor, foreman, peon, clerk, etc. Distinguish between Direct and Indirect labour: Direct labour is that labour which can be conveniently identified or attributed wholly to a particular job, product or process. Thus direct labour includes all labour expended in converting raw materials into finished goods. Indirect labour is one which is of a general character and cannot be conveniently identified with a particular job, product or process.

Examples of Indirect Labour

1. Labour employed in Service Departments like Power House, Internal Transport Service, Gate and Security.
2. Labour employed on maintenance work.
3. Storekeeping workers and other such personnel.

Organisation of Labour Department There are mainly five departments in an organisation dealing with labour:

1. Personnel Department

2. Time Recording Department.

3. Payroll Department

4. Engineering Department and

5. Cost Accounting Department

1. Personnel Department: it plays a very important role as it is primarily concerned with the proper selection and training of workers and placing them to jobs for which they are best suited. This department is a service department and renders only advisory functions.

2. Time Recording Department: The recording of time put in by a worker is required for two purposes, (i.e) for time keeping and time booking. Time keeping is the recording of time for the purpose of attendanceϖ and wage calculations. Time booking is the recording of die time for purposes of costϖ analysis and apportionment of labour costs over various jobs.

3. Payroll Department: The important functions of this department in controlling and accounting for labour costs may be listed as follows: a) To compute the wage and to prepare the payroll for each department b) To compute the payroll deductions. c) To disburse salary and wage payments.

4. Engineering Departments: This department helps in maintaining control over working conditions and production methods for each job, department. It performs the following functions. a) Preparation of plans and specifications for each job. b) Safe and efficient working conditions. c) Preparation of time and motion studies of labour. d) Making job analysis and setting piece rates.

5. Cost Accounting Department: This department is responsible for the accumulation and classification of all cost data of which labour, is one of the elements. This department is responsible for analysing the payroll in order to render, routine and special labour cost reports revealing the amount of normal and abnormal idle time, direct and indirect labour, overtime and variances from budgeted labour costs. These reports inform management of the effectiveness of labour policies and permit necessary action to be taken to retain proper control of labour costs.

Time keeping Time keeping Department is to keep a record of each worker entering and leaving time in the factory.lt is considered important to record the time, of workers entering arid leaving the factory. It is the recording of each worker's time of coming in and going out of the factory for the prurpose of attendance and wage calculations.

The objects of time-keeping :

1. To mark attendance of each worker to satisfy legal requirements.

2. To prepare wage sheets.

3. To maintain discipline in the factory.

4. To ascertain the labour cost chargeable to jobs.

5. To control labour cost.

6. To have a correct record of attendance for meeting statutory requirements.

7. Overhead distribution, if it is based on wages or labour hours.

Methods of Time-keeping: The methods of time-keeping can be broadly classified into two categories: (a) Manual methods and (b) Mechanical methods.

a) Manual Methods: There are two manual methods. These are:

Attendance Register or Muster Roll: This is the oldest method of time keeping. This register may be kept in time office ot with the foreman in the department Attendence may be marked by the time-keeper or the foreman. Under this method a register is maintained for worker‘s attendance. This method is very simple and cheap to operate. But it can be used in very, small factories. Records may not be accurate. Chances of disputes and mistakes will arise.

Token or Disc Method: Under this system, every worker is allotted a disc or token bearing his identification number. All such discs are hung on a board at the entrance of the factory. As and when a worker enters, he removes his disc from the board and puts it into the box or hangs it on another board which is specially kept for this purpose.

After the expiry of the time, the first box is removed and replaced by another for late comers. Alternatively, workers coming late may be required to report at the time office so that the exact time of their arrival can be noted. After the factory gates are closed, the, time clerk marks the attendance in register on the basis of tokens in the boxes. The absentees are indicated by the missing tokens in the box. This system is improvement on the attendance register method. It is difficult to check one worker inserting two discs into the box, one of himself and the other of his friend. It involves a large amount of clerical work and there is a possibility of mistakes.

Mechanical Methods: It is classified into three.

i)Time Clock Method: Under the mechanical methods, time clocks are used to record the worker's attendance. In this system the attendance is recorded on a clock card. When a worker enters the gate, he picks up his card from the "out" rack, inserts it into the clock and the time is stamped at the relevant space. He takes his card out and keeps it in the "In" rack. This process is reversed when he goes out of the factory. Thus every worker is allotted a card which bears the worker's identification number. These cards are kept in racks lying outside

the factory gate. There are usually two racks denoting 'out' and 'in' racks. The cards left in the 'Out' racks indicate absent workers.

Advantages:

1. It provides for correct recording of attendance.

2. Changes of false and fraudulent entries are reduced.

3. Work in connection with the preparation of wage sheets becomes is very easy.

4. The clocks produce a definite record.

ii. Dial Tune Recorders: This consists of a mechanism with a dial having a number of holes about the circumference. When a worker enters the factory, he presses the dial arm into a hole which denotes his particular number and die time is recorded automatically on an attendance form placed inside. This attendance sheet forms a part of the payroll and there is no-need of copying out the record. But this method has the following defects a) The time of worker's arrival and departure are widely separated on the paper, making the calculation of worker's total time cumbersome. b) The capacity of this machine is very much limited as the number of holes is only about 150.

i. Key Recorder System: This is a mechanism with a number of keys, each key bearing the number of a worker. When a worker enters the factory, he inserts his particular key in the key-hole and gives a turn, the ticket number and the clock time are recorded on a sheet of paper.

ii. Time Booking: It is a process of recording the time spent by a worker on differ jobs carried out by. In during his period of stay m the factory, The objects of time booking: 1. To ascertain die cost of work done. 2. To ensure that time for which worker has been paid is properly utilised. 3. To provide a basis for the appointment of over-heads, and 4. To ascertain the idle time so as to control it. Time booking may be done manually or mechanically depending, upon the size of the organisation. Large organisations, use time recording clocks for recording time on each job.

Methods of Time Booking There are five methods of Time booking. They are

1. Daily Time Sheet System: This is a daily record of the work done by a worker, showing the jobs on which he worked and the time spent against each. One sheet is allotted to each worker and a daily record is made therein. This can be used in small organisations where the number of workers as well as the number of jobs are very much limited.

2. Weekly Time Sheet: This is similar to Daily Time sheet. The difference is that instead of recording the work done for a day only, record of time for all jobs is done weekly. Here Weekly Time Sheets are kept. The weekly time sheet gives a consolidation of the total hours worked during the week and this total can be checked against the total shown in the clock cards. This methods is useful-where there are a few jobs in a week.

3. Job cards: This card is prepared for each job. This card is allotted to each worker whenever a worker takes up a particular job. Worker enters this card the time of starting the job as well as tune of finishing the job.

i) Time and Job Card: This system provides a card which consists of two sections, one to be filled up as a job and the other as a time card. This card records the attendance time and the time spent on different jobs on the same form. It consists of two sections - one for recording attendance and the other for recording the work time. Thus, tins records both the attendance time and work time of a worker on the same sheet.

ii) Labour Cost Card: This is a type of circulating job card it meant to record the time taken on the job by all the workers employed on it Instead of allotting one card to each worker, the same card is passed round and the time taken by each worker on that job is recorded on it Thus, this card gives the total labour cost of a job.

iii)Piece-Work Card: Where workers are paid on piece rate system, piecework card is used. Such a card is maintained for each job separately.

5. Wages Abstract: This is a summary prepared weekly or monthly, showing the amount of time spent by a worker on different jobs. This shows an analysis of wages paid during a period of time on different jobs.

The Wages Abstract is a medium of allocation of labour cost to different jobs. It provides a basis for writing job ledger.

Short notes on: (a) Out workers, (b) Casual workers

a) Out workers: Out workers are those workers who work outside the factory on behalf of the company.

b) Casual Workers: These are temporary workers who are appointed on daily basis in order to meet increase in production or to replace the absentee workers. These are known as casual workers. Such workers are known as casual workers as they are not regular workers of the organisation.

OVERTIME WAGES

Work done beyond the normal working hours is known as overtime work. According to the Indian Factories Act, no worker should be allowed to work for more than 9 hours a day or 48 hours a week. Suppose a worker works for more than 9 hours in a day or more than 48 hours in a week he has to be paid for his overtime at double the normal rate of wages. Overtime work involves extra cost as it has to paid at double of pauses of idle time.

Treatment of Overtime Costs.

1. If overtime is required to make up any shortfall in production or for meeting urgent orders, the overtime premium should be treated as overhead cost of the department concerned.

2. When the customer agrees to bear the entire charge of overtime due to urgency of work, it should be charged direct to the job or work order concerned.

3. Where overtime is worked due to seasonal nature, it should be treated as general overhead.

4. Overtime worked on account of abnormal conditions like floods, earth quakes, etc., should be transferred to Costing Profit and Loss Account.

5. Overtime work is work done beyond normal working hours. The Factories Act provides for payments of overtime wages at double the norms rate wages.

Control of overtime:

1. All overtime work should be duly authorised by higher officials.

2. Overtime cost should be recorded separately and shown against the department incurring it. It will help in proper planning in future.

3. If overtime is due to limited capacity of plant, new plant may be installed.

IDLE TIME

Meaning of Idle time: Idle time is that time for which wages are paid but no production is obtained. Idle time may be defined as that time for which are paid but no production is obtained. This is the time which cannot be attributed directly to any productive work. Idle time may represent loss of time of labour, machines of equipments due to lack of material, breakdown of machinery, failure of power supply, etc.

Causes of idle time:

a) Productive Causes. b) Administrative causes c) Economic causes

I. Productive causes: The productive causes may further be classified as follows: 1. Idle time due to machine break down. 2. Power failures. 3. Workers waiting for raw materials and tools. 4. Workers waiting for work. 5. Workers waiting for instructions. In all the above cases, idle time can be controlled by proper planning in advance.

II. Administrative causes: Idle time is frequency caused by administrative decisions. Sometimes administrative decisions are also responsible for idle time. For example, in case of a surplus capacity of plant and machinery, management may decide not to work fully and there may be some idle time. Therefore, such idle time arises out of abnormal situations, and it cannot be helped.

III. Economic causes: Idle time, may arise due to sever competition or seasonal nature of industries. Idle time may arise due to seasonal nature of industries. For example, in the case of woollen goods, ice-cream industry, production cannot be evenly distributed throughout the whole year. It is not possible to employ a number of workers in the busy season and to leave them during slack season.

Normal Idle Time: It refers to that loss of time which is generally unavoidable and is incidental to production.

For example:

a. Time taken from the factory gate to the department where worker is engaged and the reverse journey at the end of the day.

b. Time which elapses between completion of one job and commencement of the next.

c. Time spent in machine maintenance.

d. Tea breaks (if any), personal needs, etc.

Thus, normal idle time is of such a nature that it cannot be avoided and its cost is an expense which the employer must bear.

Treatment of Normal Idle Time: a) It is directly charged to factory overhead account. b) Wage rate may be inflated so as to make allowance for normal loss of labour time.

Abnormal Idle Time: This type of idle time arises due to inefficient of management bad luck or reasons beyond control.

Examples: Strikes and lockouts, major breakdown of machinery, fire, flood, power failure delay in material supply, etc. Measurement of Labour Turnover here are three different methods of measurement of labour turnover.

Treatment of Abnormal Idle Time: Cost of abnormal idle time should be collected separately and written off to costing profit & loss Account. It cannot be regarded as a cost of production. Control of Idle Time: For control purpose, idle time should be divided into three categories:

i. Idle time controllable by foremen, e.g., waiting for instructions, waiting for tools, faulty tool setting, interrupted flow of work, etc.
ii. ii. Idle time beyond the control of foreman but controllable from the standpoint of factory, e.g, shortage of raw material, power failure.
iii. iii. Idle time essentially beyond control, e.g., unforeseen accidents, shortage of work due to economic conditions, failure of power supply, work stoppage due to strike, etc.

The different causes which lead to idle time should be properly analysed and responsibility should be fixed on appropriate persons to control it.

Labour Turnover

Labour Turnover: It is rate of displacement of labour employed in an organisation. It is a normal feature in every business organisation that some workers leave their jobs and some new workers take their place. This mobility or change in the labour force is known as labour turnover, labour turnover may be defined as the number of workers left during the period in relation to the average number of workers on the roll during the period.

MEASUREMENT OF LABOUR TURNOVER

There are three different methods of measurement of labour turnover:

i. Separation Rate Method: This is the most commonly used method. Under this method, measurement is made by dividing the total number of separations during a period by the average number of workers on the roll during the period.

Turnover = No. of workers left during a period / Average No. of workers in the period x 100

Average number of workers is calculated as under: No. of workers in the beginning of period + Number at the end / 2 Multiplying the labour turnover formula by 100; gives the rate in percentage.

The period for which labour turnover rate is calculated may be one month, six months, one year period.

Replacement Rate Method: This method calculates labour turnover rate by taking into consideration only the number of workers joined.

Formula:

Labour Turnover = No. of replacement in a period / Averge number of workers in the period X 100 While calculating the number of replacements, new workers recruited because of expansion should not be taken into account

Flux Rate Method: This method takes into consideration both the number of workers left as well as number of new workers who have joined . Formula: Labour Turnover = No. of workers left + No.of workers replaced / Average No. of workers x 100.

This method is a combination of method 1 and method 2

CAUSES OF LABOUR TURNOVER

The causes of high labour turnover may be classified in two categories:

(i) Avoidable; and
(ii) (ii) Unavoidable Avoidable Causes:

1. Redundancy due to seasonal fluctuations, contraction m the market lack of proper planning.

2. Low wages and allowances

3. Unsatisfactory working conditions.

4. Disputes between rival trade unions.

5. Dissatisfaction with the job.

6. Lack of facilities like transport, medical, accommodation, etc.

7. Strained relationship with supervisors or fellow workers.

Unavoidable Causes:

1. Change of service for personal betterment,

2. Retirement due to old age and ill health,

3. Death,

4. Discharge on disciplinary grounds on continents long absence,

5. Marriage or pregnancy.

Effect of High Labour Turnover

Effects of Labour Turnover will increase cost of production. There are two types of Cost.

(i) Preventive cost

(ii) Replacement cost

I.Preventive Costs: Preventive costs refer to all those expenses and costs which are incurred by a firm to keep the labour force contented so that excessive labour turnover may be prevented.

The major items of preventive costs are: 1. Personal administration. 2. Cost of medical services. 3. Cost of welfare activities and schemes. 4. Pension and or provident fund schemes.

II. Replacement Costs: Replacement costs include all such losses, wastage arising because of the inexperienced new labour farce replacing the existing ones as well as die cost of recruitment and training of the new workers.

It includes the following elements: a. Loss of output due to sometime taken in obtaining new labour, b. Loss of output and quality due to inefficiency of new labour, c. Employment department expenses, d. Cost of training of new workers, e. Cost of tool and machine breakages, f. Cost of scrap and defective work, and g. Cost of accidents.

Reduction of Labour Turnover: Labour turnover rate may be reduced by taking preventive remedial measures and by removing avoidable causes. The various steps are given below

1. A satisfactory wage system.

2. Improving working conditions.

3. Strengthening the welfare measures.

4. A satisfactory policy for transfers and promotions,

5. Labour participation in management.

6. Efficient and impartial personnel administration

7. A sound personnel policy for recruitment induction and training of labour

8. A satisfactory level of amenities add welfare measures like canteen facilities, medical services, recreation etc.

9. A satisfactory security scheme like family pension, provident fund, accident compensation, etc. 10.A satisfactory policy for transfers and promotions. 11.Labour participation m management and joint consultation scheme.

Time & Motion Study

Time study aims at determining the proper speed of movements made by the workers and motion study aims at eliminating unnecessary movements. Time study: It may be defined as "the art of observing and recording the time required to do each detailed element of an industrial operation" Its main object is to determine the standard time required to carry out a job most efficiently. Motion Study: This study deals with one aspect of methods study, i.e., to eliminate unnecessary movements of men and material. "Motion study is the science of eliminating wastefulness resulting from using unnecessary, illdirected and inefficient motions". It is a detailed study and analysis of die movements of an operation in performing an operation for the purpose of eliminating unnecessary and useless motions:

Write notes on the following: (a) Job Evaluation and (b) Merit Rating

I. Job evaluation: Job evaluation may be defined as the rating of various jobs according to the responsibility and skill required from them. The basic object of job evaluation is to ascertain the relative worth of each job through an objective evaluation so that relative remuneration can be fixed for different jobs.

II. II. Merit Rating: Merit rating is a systematic evaluation of the personality and performance of each employee by his supervisors or some other labour qualified persons. It is a system by which the performance of an employee is objectively evaluated and compared with that of others in his work group

Methods of Wage Payment

There are mainly three methods of labour remuneration:

a) Time Rate System

b) Piece Rate System

c) Incentive Schemes.

If a worker may be paid on the basis of time mat he spends on his job is known as Time Rate. If he may be paid on the basis of quantity of work done by him is known as piece rate.

Time Rate System: This is the oldest of the wage payment systems. In this system time is made the basis of payment. Labour is paid for the time worked irrespective of the volume of production during that time. The formula for calculating wages under this system is:

Time Rate (T.R) = Hours worked x Rate per hour

Payment may be based upon the hour, the day or the week, or it may be at the fixed salary rate. Wages = Time spent x Rate per hour (T x R)

E.g.: Mr. X is paid at the rate of Rs. 10 per hour. During the month he spends 200 hours. Calculate Mr. X earnings. Earnings=200 hours x Rs. 10 per hour = Rs. 2000 per month.

Types of Time Rates : a) Times Rates at Ordinary Levels: In this system, time is made the basis of payment irrespective of quantity of work done by a worker payment is made at a rate on attendance by hour, week or a month.

Formula: Time Rate = hours worked x Rate per hour

Time Rate at High Levels: Under this system, the worker is paid at a wages which is substantially higher than the rate prevailing in that area or industry.

Graduated Time Rates: This system provides for variation in the wage

According to changes in the cost of living index. The rates are to be adjusted periodically according to index.

Advantages:

1. The workers are assured of minimum wages which gives them a sense of security.

2. The calculation of the amount of wages is simplified.

3. Workers avoid over-speeding arid thus cause less daniage to equipment.

4. Quality of work produced this method does not give weight to the volume of work done.

5. Trade unions generally oppose tins mode of payment.

Drawback:

1. It does not distinguish between efficient and inefficient workers.

2. There is no incentive to work more.

3. From costing point of view, it creates difficulties in the calculation of labour cost per unit as the output is quite fluctuating.

4. It needs extra provision for supervision so that workers do not waste their same.

Piece Rate System: Under this system a worker is paid a fixed amount per unit produced irrespective of the time taken. A rate per unit of output is fixed and wages are calculated as

follows: Piece rate = No. of units produced x Rate per unit (N x R) Earnings = No. of Units produced x Rate per unit (N x R)

Example: Mr. X is paid at the Rate of Rs. 4 per unit He produced 500 unit during the month. Calculate his total earnings?

Earnings = 500 Units x Rs. 4 per unit=Rs. 2000 per month.

Advantages:

1. It distinguishes between efficient and inefficient workers.

2. It provides a strong incentive because remuneration is in direct ratio to the worker‘s effort.

3. Costing is simplified because the exact cost of labour per unit is known in advance.

4. Strict supervision is not necessary.

Drawbacks:

1. Workers try to produce maximum quantity to increase, their wages. In the process quality of products is ignored.

2. Minimum amount of wages is not guaranteed.

3. High speed has injurious effect on the health of workers and also on equipment and machinery.

4. Trade unions generally oppose this mode of payment. 5. It involves maintenance of larger records tor payroll.

TYPES OF PIECE RATES

Straight Piece Rates: This system makes quantity of work as the basis wage payment. A fixed sum per unit of output is given to a worker irrespective of the time taken by him.

The formula is: Piece Rate = Units produced x Rate per unit (N x R)

ii. Piece Rates with guaranteed day rate: In this system, some minimum wage is guaranteed to a worker and if his wage at piece rates, by chance, con out to be less than the guaranteed minimum wage, he shall get the minim wage and not the piece wage.

iii. Differential Piece Rates: Under this system, rates of wages vary at different levels of output. As the output increases, the rate also increases. The crease in rates may be proportionate to the increase in output or proportion a more or less than that. The object of this system is to reward the efficient workers and at the same time to encourage the less efficient to attain standards. Taylor, Merrick, Gantt task and Bonus and Emerson efficiency plan are used this system of payment.

iv.Bonus System and Incentive Schemes

The bonus system may take either of two forms - Individual Bonus System or Group Bonus System. Indirect Monetary Incentives: Profit Sharing Scheme: Profit sharing schemes are those where there is an agreement between the employer and his workers whereby the employer agrees to pay to workers, in addition to their wages, a share of profit at an agreed rate. Co-partnership: Workers ate given the opportunity to have a share in the capital of business and to receive the profits accruing to their share Non - memory benefits may be given in numerous ways like medical facilities, educational facilities, subsidised canteen, better working conditions, housing facilities and such other welfare measures.

Incentive Wage Plan: Incentive may be defined as "the stimulation of effort and effectiveness by offering monetary inducement or enhanced facilities" An incentive may be monetary, i.e., cash benefit, or non-monetary.

Principles of a Good Incentive Scheme:

1. The scheme should be simple and easily understandable by workers

2. The scheme should be fair, to both employer and employee.

3. The cost of operating the scheme should be reasonably low,

4. The standard of performance should be scientifically set and should be within the reasonable reach of an average worker.

5. No limit should be put on the earnings of workers.

6. The scheme should have the approval of workers and the union.

7. The scheme bonus provide a satisfactory system of supervision and production control.

8. The scheme must be relatively permanent.

9. Indirect workers should also be included under this scheme.

10.Workers should be properly educated.

Incentive Schemes Under Incentive schemes, time rate and piece rate systems are combined in such a way that workers are induced to increase their productivity.

Various Incentive plans are

1. Halsey Plan:

This plan was first introduced by F.A. Halsey, a mechanical engineer in America, in 1891. This is a simple combination of time and piece basis of payment. Under this plan, bonus is paid on the basis of time saved.

The amount of bonus depends upon die time saved by the worker.

Where, Time saved = standard time - Actual Time taken A standard time is set for each job.

If a worker takes the standard time to do it or even exceeds the standard time limit, he gets normal wages calculated at die time rate.

If he completes his job in less than the standard time, he gets a bonus equal to 50% of the value of time saved.

Therefore, die total earnings of a worker under this system are wages for the actual time spent plus a bonus equal to 50% of the. Value of time saved.

The formula: Bonus 50% of [Time saved x Time rate]

= 50% [1 hour x Re. 1.00] = 50% [Re. 1.00]- 50 paise

Total earnings - (6 hour \ Re. 1.00 + 50 paise - Rs. 6.50.

Advantages:

1. It is easy to understand and simple to operate.

2. This plan provides a strong incentive to improve efficiency.

3. The worker earns bonus on every job individually and the time saved by a worker on one-job is not set off against the excess tune taken on some other job.

4. It guarantees minimum wages according to time rate and thus provides a sense of security to workers.

5. The benefit of time saved is equally distributed between workers and employers.

6. It provides a strong incentive to increase production.

Disadvantages:

1. Incentive is not as strong as with piece rate system. Generally, the harder the worker works, the lesser he gets per unit.

2. It does not give full protection to employer against wrong rate setting.

3. Workers do not welcome the sharing principle.

2. Halsey Weir Plan:

This system was introduced by G.T. Weir and is a modified form of the original Halsey plan. The only difference between the two is that under the Halsey Weir plan the bonus is equal to 30% of time saved.

3. Rowan Plan :

This plan was introduced by David Rowan and is similar to Halsey Plan, except in the calculation of the amount of bonus. Bonus is that proportion of the wages of the time taken which the time saved bears to the standard time. Its formula is :

Bonus = Time saved / Standard time x time taken \ Rate per hour

Total earnings = (Time taken x Rate per hour x Bonus)

Advantages:

1. It provides a guaranteed minimum wage as well as incentive for efficiency.

2. It provides the employer an incentive to increase production facilities as he receives a large share in savings achieved.

3. The Rowan plan provides a better bonus than the Halsey 50% scheme.

4. Up to 50% of the time saved, it provides a higher bonus than under Halsey Plan. It offers protection to the employer when standard has not been properly fixed,

5. As die bonus increases at a decreasing rate, at higher levels of efficiency, the worker is not induced to rush through the work.

Disadvantages:

1. It is more complicated and costlier than the Halsey system.

2. It is not easily understood by workers and leads sometimes to disputes.

3. It does not provide adequate incentives beyond a certain level.

4. Where time saved is more than 50% of the standard, time, the total earnings start decreasing. Bonus = Time saved / Standard Time x Rate per hour x Actual time

Taylor's Differential Piece Rate System: This system was introduced by Taylor, who was the father of Scientific Management Under this plan no time basis wages are guaranteed, but two piece rates are fixed, low piece rate and high piece rate . The lower rate is for those who are not able to achieve the standard output and higher rate is for those whose output is at or above the standard. Under this system, the standard job is established after careful time and motion study and two piece rates are set.

The features of the scheme: 1) Day wages are not guaranteed. 2) A standard time for job established. 3) Two piece work rates are fixed. If the worker does the work in less than the standard time, he receives the higher piece rate, whereas if he takes longer time he receives the lower piece rate.

Advantages:

1) This method is simple to understand and calculation of wages is not difficult. It also provides a strong incentive to efficient workers.

2) It is advantageous from the point of view of the employer since it helps much in increasing production by offering higher rates to more efficient workers.

3) It attracts efficient workers.

4) Where the overhead's are high its incidence per unit cost is reduced because of increased production.

Disadvantages:

1) It penalises very slow or inefficient workers.

2) It does not guarantee, the minimum day wages and this insecurity affects the morale of workers. 3) Labour cost will differ between the two levels of performance because of two different rates.

4) It makes differences between efficient and inefficient workers and thus creative rivalry.

5) This system is unfair to beginners who cannot attain the standard output immediately.

Merrick's Differential Piece Rate System: It is a modified version of the Taylor's scheme and is also known Multiple Piece Rate System. Workers producing below die standard output are not penalised by the low piece rate. This plan lays down three rates, one for the beginner, the second for die developing workers and the third for die highly efficient workers.

a) Upto 83% of the standard output, the workers are paid at the ordinary piece rate i.e., the lowest of the three rates.

b) Those, whose output exceeds $3% of the standard but does not reach 100%, axe paid at 110%of the ordinary piece rate.

c) Those whose output is 100% or above, get the highest rate which is 120% of the ordinary piece rate.

Features of the scheme: a) Up to 83% of the standard output, workers are paid at the on piece rate. b) 83% to 100 % of the standard output, at 110% ordinary piece rate and c) above 100% at 120% of the ordinary rate. The earnings increase with increased efficiency, performance above the standard will be rewarded by more than one higher differential piece rate. This plan is effective for high-level production.

Emerson's Efficiency Plan: This is an American scheme which combines guaranteed fixed day wage with a differential piece rate. This system guarantees time wages even to those whose output is below standard. Standard output is fixed to represent 100% efficiency. A bonus is paid to a worker whose output exceeds 66 2/3 % of the standard output. The bonus increases gradually at a stated rate so that at 100% efficiency bonus would rise to 20%. Beyond this, bonus would increase at l% of basic rate for every 1% increase in output.

Features of the scheme: A certain standard output is fixed for a worker for each job. A worker who is able to attain two - thirds of standard output is deemed a normal worker and gets only

guaranteed time rate. A worker who goes above the two-thirds standard, is paid, in addition to his normal wage, a bonus the rate of which increases as the extent of the excess of the output over two-thirds standard increases.

Advantages:

1) The system is simple to understand and easy calculation. It provides incentives for beginners also. 2) The disparity in wages among workers under the other systems is also reduced here. 3) It provides security to the worker as day wage is guaranteed.

Disadvantages:

The incentive is quite small to attract very different and ambitious workers.

Gand's Task and Bonus Plan: This plan is a combination of time rate, piece rate and bonus. It guarantees wages according to time basis. A high standard is set and if this standard is achieved or exceeded, payment is made at a high piece rate. This piece rate is so fixed so as to include a bonus of 20% over the time rate of the worker. A worker who is not able to achieve the-standard or whose efficiency is below 100%, gets wages at time rate and is not entitled to bonus.

The main feature as of this system are:

1. It is a combination of time rate, differential piece rate and bonus.

2. Day wages are guaranteed.

3. A standard task is set, on which a bonus may be earned if completed within the standard time.

4. The bonus is a fixed percentage on the time taken.

5. A worker who attains the standard is paid a bonus, usually of 20% on his time rate.

Where he goes above the standard he gets at a higher piece rate on the worker's whole output. Thus under this system, both time and piece rates are set and normal wages are paid at the time rate or piece rate, Whichever is higher, in addition, a bonus is also given if the work is completed within standard time.

Advantages: 1. It is simple to understand and easy to operate. 2. It provides an incentive to the efficient worker as well as security for less efficient by guaranteeing the time rate. 3. It is useful where the overheads are very high. 4. It encourages better supervision and planning as under this scheme, foreman also receives bonus.

Disadvantages: Guaranteed time rate Wage may act as a disinc for improved production in case rate is fixed at a high level.

Bedaux Point Premium System: This is premium bonus system in which standard tin determined by work study, the time unit being the minute. A mi allowed time is termed as

Bedaux point or "B", sixty units make in hour's work, and the number of Bedaux points being determined in respect of each job.

Group Bonus Scheme

Bonus may be given individually to every worker or collectively to a group of workers. When it is given collectively, it is known as group bonus scheme. It is a scheme in which the bonus is calculated on the collective production of a group of interdependent workers and distributed among the individual members of the group on some agreed basis. This system is employed in cases where the output of individual workers cannot be measured and the ultimate production is dependent on the collective efforts of a group of workers as a whole. Group system of payment encourages co-operation and team work among the workers. Supervision work is reduced.

Advantages:

1. It infuses co-operation and team-work among the workers.

2. Absenteeism is often reduced because an absent member weakens the group and most workers do not like to let down their team

3. This system requires less clerical work.

4. Supervision work is reduced.

5. Indirect workers can also be included in the scheme.

Disadvantages:

1. This system is unfair to hard-working and efficient workers of the group as an efficient worker is penalised for in efficiency of other members of the group.

2. It is difficult to get workers acceptance of the scheme.

3. There may be some practical difficulties regarding fixing the amount of incentive and how it is to be distributed to individual workers.

4. The amount paid as bonus to each member of the group is as small and that may not prove to be an effective incentive.

ESSENTIALS OF A GOOD WAGE SYSTEM

Simplicity: The method should be simple and easy to understand by workers so that workers so that workers can calculate their own wages.

Minimum wage: A good system should guarantee minimum wage to give workers a sense of security.

Incentive: The scheme of payment should provide sufficient incentive to workers to work more taking into account the quality of production.

Flexibility: The system should be flexible enough so that changes may be introduced, if necessary. Satisfaction: The system should be satisfactory from the point of view of both worker and the employer.

Law labour turnover and absenteeism: A good system should reduce labour turnover and absenteeism.
Economical: It should be economical in operation.
Approval of Trade Union: It should be acceptable to trade union.

Fringe benefits: Fringe Benefits (Individual Monetary benefits):
Dearness Allowance
Sick Pay
Provident Fund
Employee's State Insurance
Maternity Leave Pay
Night Shift Allowance
Holiday Pay
Gratuity;
Pension
Annual Bonus
Fringe Benefits

(GroupNon-Monetary):

Subsidised Conveyance
Subsidised Canteen Facilities.
Medical Care Free Housing.

CONTROL OVER LABOUR COSTS

Labour control is primarily concerned with the proper employment and efficient utilization of labour force. Labour cost control aims at the control of the labour cost per unit-of production and not at the reduction of wage rates of workmen.

1. Control over labour cost can be exercised in the fallowing manner:

2. Production Planning: Production should be so planned as to have the maximum and rational utilization of labour. Production plarmmg consists of the product and process engineering, programming, routing and direction.

3. Recruitment of Efficient Workers: Proper selection and training of workers and placing them to the jobs for which they are best suited helps in achieving the optimum output and minimum labpur cost per unit.

4. Wage Policy: Wage plan including incentive scheme should be studied to find out how far the remuneration paid on the basis of incentive plan matches with increased production.

5. Setting up of Standards: With the help of work study time study and motion study, standards are set for production operations.

6. Labour Budgets: Labour budgets are also used for control over labour costs.

7. Labour Performance Reports: Management can also exercise control on labour and labour cost with the help of periodical labour utilization and labour efficiency reports.

Direct Expenses. (Chargeable Expenses) A chargeable expense is an expense which is specifically incurred in connection with the execution of a particular job or work order. If includes all direct expenses other than those-of direct material and direct labour. It forms a part of prime cost of the product.

Examples for chargeable expenses are: 1. Hire of special plant and machinery required for a. particular job product or process. 2. Cost of patents and royalties. 3. Cost of special layout designs or drawings. 4. Experimental costs and expenditure in connection with models and pilot schemes. 5. Fees paid to architects surveyors and other consultants in connection with a job. Chargeable expense is that which can be allocated directly to a cost unit. But overhead expenses cannot be allocated to cost units. These have to be apportioned or absorbed by cost centres or cost units.

Labour Cost Control

Additions Method:

$$= \frac{\text{Number of Additions}}{\text{Number of average workers during the period}} \times 100$$

Separation Method:

$$= \frac{\text{Number of Separations}}{\text{Number of average workers during the period}} \times 100$$

Replacement Method:

$$= \frac{\text{Number of Replacements}}{\text{Number of average workers during the period}} \times 100$$

LABOUR TURNOVER

Note: Problems reference Book: Cost Accounting
Author: T.S. Reddy and Y.Hari Prasad Reddy

1) The extracts from the payroll of M/s Maheswari Bros is as follows

No.of employees at the beginning of 2005	150
No.of Employees at the end of 2005	200
Number of employees resigned	20

Number of employees discharged 5
Number of employees replaced due to resignations and discharges 20
Calculate the labour turnover rate for the factory under separation method
Average Workers During the period =No.of employees At the beginning+ No.Of Employees at the end

$$= \frac{150+200}{2}$$

= 175 employees

$$\text{Separation Method} = \frac{\text{Number of separations}}{\text{No.0f average workers during the period}} \times 100$$

$$= \frac{20+5}{175} \times 100$$

= 14.285%

2) Regavendra Metal company gives the following information:

Number of employees on 1-4-1999	200
Number of employees on 31-3-2000	240
Number of employees resigned	20
Number of employees discharged	5
Number of employees replaced	18

Calculate the labour turnover by applying three methods

$$\text{Average number of workers during the period} = \frac{\text{No.of employees at the beginning of the year+ No.of employees at the end}}{2}$$

=200+240/2
= 220 employees

$$\text{Separation Method} = \frac{\text{No.ofSeparartion}}{\text{No.of average employees during the year}} \times 100$$

=20+5/220 x100
= 11.36%

$$\text{Replacement Method} = \frac{\text{No.of replacement}}{\text{No.Of average workers during the Year}} \times 100$$

= 18/220 x 100
= 8.18%

$$\text{Flux method} = \frac{\text{No.of Separations + No of replacemts}}{\text{No.Of average workers during the Year}} \times 100$$

=(20+5) + 18 X 100
220
= 43/ 220 X 100

= 19.54%

COMPUTATION OF TREATMENT OF LABOUR COST

NORMAL AND OVER TIME WAGES

3) Calculate the normal and overtime wages payable to a workman from the following data:

Days	**Hours worked**
Monday	8
Tuesday	12
Wednesday	10
Thursday	10
Friday	9
Saturday	4

	53

Normal working hours – 8 hours per day, on Saturday – 4 hours.

Normal rate Rs.2 per hour.

Overtime rate – Upto 9 hours in a day at single rate and over 9 hours in a day at double rate. Or upto 48 hours in a week at single rate and over 48 hours at double rate, whichever is more beneficial to the workers.

Answer:

Statement Showing Over time rates

Days	Total Hours	Normal Working Hours	Overtime hours	
			Single rate	Double rate
Monday	8	8	-	-
Tuesday	12	8	1	3
Wednesday	10	8	1	1
Thursday	10	8	1	1
Friday	9	8	1	-
Saturday	4	4	-	-
Total Hours	53	44	4	5

Computation of Total wages of Workman (Day's Work)

		Rs.
Wages for Normal Working Hours 44 x 2		88
Wages for Over time hours:		
Single rate for 4 hours (4 x2)	8	
Double rate for 5 hours (5x4)	20	28
Total wages		**116**

Computation of Total wages of Workman (Week Work basis)

Wages at Normal rate 48 x2	96
Over time wages (53-48) 5 x 4	20
Total wages	**116**

Both methods are equally beneficial for the employees.

4. Calculate the normal and overtime wages payable to a workman from the following data:

Days	Hours worked
Monday	8
Tuesday	10
Wednesday	9
Thursday	11
Friday	9
Saturday	4

Normal working hours – 8 hours per day

Normal rate: Rs.2 per hour

Overtime rate: Double the usual rate.

Answer:

Statement Showing Over time rates

Days	Total Hours	Normal Working Hours	Over time Hours
Monday	8	8	-
Tuesday	10	8	2
Wednesday	9	8	1
Thursday	11	8	3
Friday	9	8	1
Saturday	4	4	-
Total Hours	51	44	7

Calculation of Wages

Normal Working hour wages 44 x 2 = 88
Overtime Working Hours 7 x 4 = 28
116

5. From the following data prepare a statement showing the cost per day of eight hours of engaging a particular type of labour:

(a) Monthly basic salary plus D.A. Rs.400;
(b) Leave salary 5% of (a)
(c) Employer's contribution to P.F. 8% of (a) and (b)
(d) Employer's contribution to ESI – 2 ½ % of (a) and (b)
(e) Pro – rata expenditure on amenities to labourRs. 35 per head p.m.
(f) Number of working hours in a month 200.

Calculation Of Cost Labour (Per month)

Particulars	Rs
Monthly Basic Salary	400.0
Leave Salary 5% (400 x5%)	20.0
Employer's Contribution P.F (8% of A and B) = 400+20 = 420 x8%	33.6
Employer's Contribution to ESI = 420 x 2.5%	10.5
Amenities per Labour	35.0
Total	499.10

Per day=8 hours

Per month=200 hours

Cost per labour per hour=499.10 / 200

= 2.4955 per hour

Per day (8 hours) = 2.4955 x 8

= Rs.19.96

6. From the following particulars prepare a statement showing the labour cost per man day of 8 hours.

(a) Basic salary – Rs.2 per day
(b) Dearness allowance – 25 ps for every point over 100 (cost of living index for working class) Current cost of living index is 700 points.
(c) Leave salary – 10% of (a) and (b)
(d) Employer's contribution to P.F – 8% of (a), (b) and (c)
(e) Employer's contribution to state insurance 2.5% of (a), (b) and (c).
(f) Expenditure on amenities to labour Rs.20 per head per mensem.
(g) Number of working days in a month – 25 days of 8 hours each.

Calculation of Cost of labour (Per month)

Particulars	Rs
a) Basic Salary (25 days x2)	50.00
b) Dearness Allowance	
Cost of index 700- 100 = 600 points	
D.A 600 x 0.25	150.00
c) Leave Salary (10% of A and B)	
50+150 = 200 x 10%	20.00
D) Employers Contribution (8% of A,B, and C)	
(50+150+20) 220 x 8%	17.60
e) Employer's Contribution to State Insurance(2.5% on A,B and C) 220 x2.5%	5.50
Expenditure on Amenities	20.00
Total	263.10

Cost per Labour per day =263.10/ 25

= Rs. 10.524 per day

7. Find out the wage per hour from the following information:

Name of the worker: Mr. Krishna

Wages per year: Rs.2400

Annual Bonus: 25% of wages

Employer's contribution to P.F – 10% of wages

Employee's contribution to P.F. – 8% of wages

Employer's contribution to E.S.I. – 3% of wages

Total leave with pay permitted during the year – 60 days

Cost of Labour Welfare Amenities – Rs.8000

No. of Workmen – 200

Normal Idle Time: 80 hours

Working days per annum – 320 days of 8 hours.

Effective Working Days

No. of Days in year	**320**
Leave with salary	**60**
Effective Working days	**260**

Calculation of Effective Working Hours

Hours per year	**260 x 8**	**2080**
Normal Idle hours	**80**	
Effective Working Hours per Year	**2000**	

Statement Showing Cost of Labour per year(Mr.Krishna)

Particulars	**Rs**
Wages per Year	**2400.00**
Annual Bonus 2400 x25%	**600.00**
Employer's Contribution 2400 x 10%	**240.00**
Employer's Contribution to ESI 2400 x 3%	**72.00**
Welfare Amenities 8000 / 200	**40.00**
Total wages of Mr. Krishna	**3352.00**

Effective Cost of Wages per hour = 3352.00 / 2000

= Rs.1.676 per hour

8. Raj works in a factory where the following particulars apply;

Normal rate per hour – Rs.1.50

Normal piece rate = 20% more of time rate

Expected output 20 units per hour.

Raj produces 157 units in an 8 hour day.

Calculate his wages for the day on:

(a) Time basis and
(b) Piece basis

Time and piece rate System

Calculation Under the Time Rate System

Time Rate Per hour = Rs.1.50
Hours Worked = 8 hrs

Raj's Wages= Hours Worked x Time Rate Per Hour
= 8 x 1.50
= Rs. 12

Calculation Under The Piece rate System
Calculation of Piece rate
Normal Time rate = 1.50
20% more
1.50 x 20% = 0.30

1.80

Standard Output perhour 20 Units

Piece rate Per Unit= 20 / 1.80
=Rs. 0.09

Raj's Wages under Piece rate System

Raj's production = 157 Units

Raj Wages = 157 x 0.09

Total Wages = Rs. 14.13

9.The output of the worker A is 60 units in a 40 hours week.

Guaranteed time rate is Rs.5 per hour. Ordinary piece rate is Rs.2 per unit. Show the earnings of Worker A under time rate and piece rate systems.

Calculation Based on Time Rate

Wages Of Worker "A" = Hours Worked X Time rate per Hour
= 40 x 5
= Rs. 200

Calculation Based On Piece Rate System

Wages 0f Worker "A" = No of Units Produced x Rate per Piece
= 60 x 2
= Rs. 120

10. Standard time allowed for a job is 50hours. The hourly rate of wage is Rs.10 per hour plus a dearness allowance of Rs.5 per hour worked. Actual time taken 40 hours. Calculate total wages on time and piece wages.

Calculation Based on Time rate

Wages = Hours Worked X Rate Per Hour		
= 40 x 10		= 400
+ Dearness Allowance (40 hrs x 5)		= 200

Time Wages	600	

Wages on Piece rate System

Wages = Standard Time x Std rate per Hour		
= 50 Hrs X 10		= 500
+ Dearness Allowance		
(40 x 5)		**= 200**
Total wages		---
	700	
		---

11. A company has set 5 units per hour as the standard output, each unit having a piece rate of Rs.3. In a normal day of 8 hours, Raman produces 35 units and Krishnan produces 50 units. The usual hourly rate applicable to all workers is Rs.15.

Find out the earnings of Raman and Krishnan.

(a) If only time rate system is used;
(b) If only piece rate system is used;
(c) If piece rate with guaranteed time rate is applied

Calculation of Time rate System

Wages = No. Of Hours Worked X Time rate per Hour

Raman = 8 x 15 = Rs. 120
Krishnan = 8 x 15 = Rs. 120

Calculation Based on Piece Rate System
Wages= No.of Units Produced X Rate per Unit
Raman = 35 x 3 = Rs. 105
Krishnan = 50 X 3 = Rs. 150

Calculation of Piece rate if Guaranteed Time rate
Raman = 35 x 3= 105 or 8 x 15 = 120- which is ever is higher
Krishnan = 50 x 3 =150 or 8 x 15 = 120

Raman= 120
Krishnan =150

Taylors Differential Rate System

12) From the following particulars, calculate wages earned by workers X, Y and Z respectively under the Taylors's System:

Standard Time Allowed : 10 units per hour

Normal wage Rate : Rs.10 per hour

Differential rates to be applied:

90% of piece rate when at or above the standard

The production on a day of 8 hours

X -75 units: Y -85 Units: Z -120 units

Answer:

Standard Time = 10 units per hour

Standard output per day = 10 x8 hrs

Standard Output = 80 Units per day

Calculation of Piece rate

Piece rate = Wages Per Hour

Std Units Per Hour

= 10/ 10

Piece Rate = Re.1 per Unit

Calculate earning of the Workers under Taylor's Differential rate System

X = 75 units
Y = 85 Units
Z = 120 Units
Calculation of the level of efficiency of the Workers
= Actual Output x 100
Stad. Output
X = 75 /80 x 100
= 93.75% (Below Standard)
Y = 85 /80 x100
= 106.25% (Above Standard)
Z = 120 /80 x 100
= 150% (Above Standard)

Calculation of earnings
Below standard = 90% of piece rate
Above Standard = 125% of Piece rate

X= 75 x 1 x 90/100
= Rs.67.50
Y = 85 x 1 x 125/100
= Rs.106.25
Z= 120 x 1 x 125 /100
= Rs. 150

13) Calculate the earnings of workers A and B under straight piece rate system and taylors differential rate system from the following particulars:
Normal Rate per hour - Rs. 1.80
Standard time per unit – 20 seconds
Differnetials to be applied
80% of piece rate below standard
120% of piece rate at or Above standard
Worker A produces 1300 units per day and Worker B produces 1500 units per day
Answer:
Std time Per Unit = 20 Seconds
Std unit per minute = 60 / 20= 3 Units per minute
Std Units Per Hour = 60 x 3
= 180 units per hour
Std Units Per Day = 180 x 8 hrs
= 1440 units
Calculation Piece Rate
Piece rate = Wages Per Hour
Std. Units per Hour

Piece rate = 1.80 / 180
Piece rate = Rs. 0.01 per Unit
Calculation of Level of efficiency of Workers = Actual Output x 100
Std. Output

A = 1300 / 1440 x 100

= 90.28% (Below Standard)

B = 1500 / 1440 x 100
= 104.167% (Above Standard)

Calculation Under Straight Piece rate System
Earnings = Actual Output X Rate Per Unit
A= 1300 x 0.01
= Rs. 13

B = 1500 x 0.01
= Rs. 15

Calculation of earnings Under Taylors Differential piece rate System
80 % of Piece rate for below Standard
120 % of Piece rate for at or Above Standard

A= 1300 x 0.01 x 80 /100
= Rs. 10.40

B = 1500 x 0.01 x 120/100
= Rs. 18