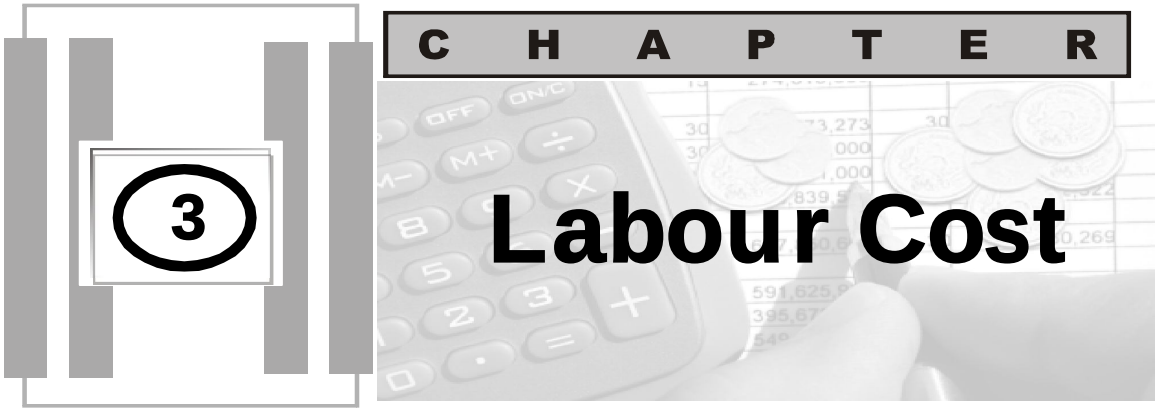


LABOUR

Direct labour costs consist of gross wages paid to those who physically and directly work on the goods being produced. For example, wages paid to welder in bicycle factory who is actually fabricating the frames of bicycles would be included in direct labour. On the other hand, the wages paid to a weouder who is building an assembly line that will be used to produce a new line of bicycles is not direct labour. In general, indirect labour pertains to wages of other factory employees (e.g., maintenance personnel, supervisors, guards, etc.) who do not work directly on a product. Indirect labour is rolled into manufacturing overhead.

Flow chart of Direct Labour Cost Analysis: The following flowchart depicts the key events completed as part of a typical direct labour cost analysis.

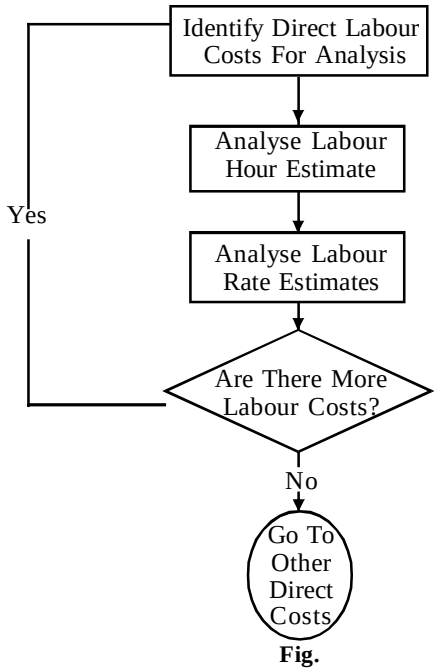


Fig.

Identifying Direct Labor Costs For Analysis

This section presents points that you should consider as you identify direct labor costs and plan for further analysis.

- Identifying Direct Labour Classifications
- Identifying Major Types of Direct Labour
- Planning For Further Analysis

Labour represents the human contribution to production and it is the second major element of cost after material cost. The role of labour in the production process cannot be underestimated even in an organisation which uses fully automatic technology in its production process. Hence, there is a need to properly organise, account and control the labour cost.

Labour Cost is divided into two types:

(1) Direct Labour Cost: Direct labour is that labour which is directly engaged in the production work and can be conveniently identified or attributed wholly to a particular cost unit, job or process.

Example: Wages of machine operator is a direct labour cost.

(2) Indirect Labour Cost: Indirect labour is the wages paid to those workers who are not directly engaged in converting the raw materials into finished goods. Such costs cannot be conveniently identified with a particular job, produce or a cost unit.

Example: Wages of supervisors, cleaners, instructors, peons, watchmen, etc., are examples of indirect labour cost.

Labour Remuneration

Remuneration is the amount of consideration paid for services rendered by an employee. The major part of remuneration is in the form of wages and salaries but it also includes perquisites and other benefits. Remuneration is a way of rewarding the people for their contribution to the organisation. Labour is one of the factors of production.

Table: Factors of Production

Factor of Production	Rewards
(1) Land	Rent
(2) Labour	Wages and Salaries
(3) Capital	Interest
(4) Entrepreneur	Profit

Each factors of production is entitled for their rewards. Similarly, labour is entitled for wages and salaries as a reward. The term remuneration covers the total monetory earnings of an employees. It includes wages and other financial incentives.

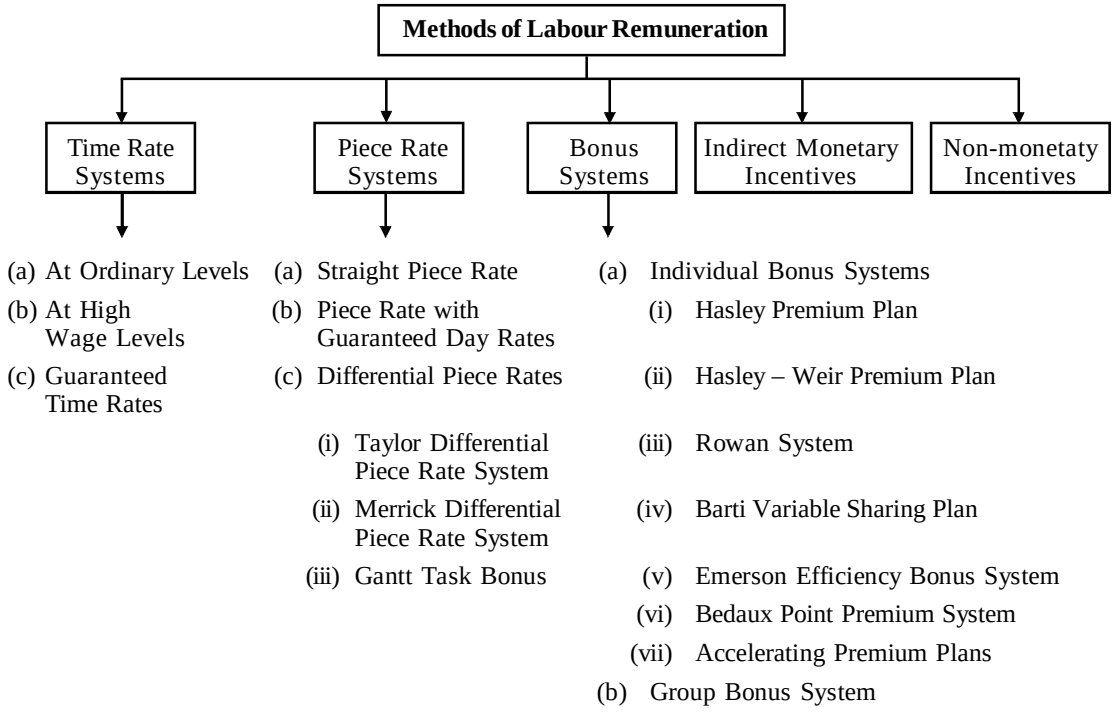


Fig: Methods of Labour Remuneration

(1) Time Rate System

(a) Time Rate System at Ordinary Levels: This is the simplest, oldest and most common method of wage payment. In this system the payment is made to the workers based on the time for which they work. In this case, a definite amount of payment is guaranteed for a specified time and payment is made on the basis of time which may be an hour, a day, a week, a fortnight or a month. In this case, the actual output is not taken into account while making the payment. Each worker is assured of minimum wages.

Payment = Hours Worked × Rate per Hour

(b) Time Rates at High Wage Levels: This system is similar to Time Rate System at ordinary levels except that the time rate is high, than the time rate at ordinary level, in order to have a higher standards of performance. High rate is an incentive. If there is, no increase in production cost, high wages increase labour cost.

(c) Guaranteed Time Rates: In this system the payment is at the time rates but considering cost of living, merit awards for personal qualities, skill, ability, punctuality, performance, etc. This system is acceptable to the workers.

(2) Piece Rate System: In the piece rate system a rate is fixed per unit of production and wages are calculated and paid according to the quantity of work done.

Wages = Rate per unit × Number of units produced

This method does not give any consideration to the time taken by the worker in completing the work only the quantity of the work performed is taken into account for the payment of wages.

This method provides a strong incentive for the workers to work more as the remuneration is in proportion to the worker's efforts. This method is simple and easily understood by the workers. This method decreases the supervision cost as workers themselves are interested in maximising their earnings through the maximisation of output.

(a) Straight Piece Rates: Under this system, irrespective of the time taken the worker receives a flat rate of pay per unit of output. The earnings of the worker depends upon the number of units produced.

(i) Where rate per unit is known:

Earnings = Rate per unit × Number of units

(ii) Where standard hour rate is known:

Earnings = Standard hours of produced × Rate per standard hour

Under the standard hour method the operator is paid at a fixed time rate for the number of standard hours of work he produces. The rate is not expressed as rate per piece instead it is expressed as rate per unit of standard time.

(b) Piece Rates with Guaranteed Day Rate: Under this system a worker receives straight piece rate for the number of pieces he produces provided his total remuneration is greater than his earnings on a time rate basis. If the piece rate earnings fall below the time rate earnings then the time rate earnings are paid. An alternative form of this method is a guaranteed time rate plus a piece rate payment for output above a stated minimum amount.

(c) Differential Piece Rates: Under the differential piece rate systems the rate per standard hour of production is increased as the output level increases. This scheme aims at maximum production by giving an additional incentive to increase output.

The following are the main systems that uses the principle of differential piece rate system.

(i) Taylor Differential Piece Rate System: The originator of this system is Fredrick Winslow Taylor, who is also termed as the Father of Scientific Management. In this system it provides a two piece-rates, a low piece rate for output below standard and a high piece rate for output above standard. This scheme has a very strong incentive to expert workers and rewards them attractively. This scheme is suitable in mass production industries.

(ii) Merrick Differential Piece Rate System: This system is a modification of the Taylor's system and it uses three rates instead of two rates as in the Taylor's system. The rates of remuneration are:

Output Percentage	Standard Payment
(1) Up to 83%	Ordinary Piece Rate
(2) 83% to 100%	110% of Ordinary Piece Rate
(3) Over 100%	120% of Ordinary Piece Rate

According to Merrick's system, every worker was paid solely on the basis of the output. This plan is useful for workers who are potentially high performers.

(iii) Gantt Task Bonus Plan: Gantt task bonus plan is a combined time, bonus and piece rate plan using the differential piece rate principle. Remuneration under this plan is calculated as follows:

Output	Payment
(1) Output below Standard	Time Rate
(2) Output at Standard	Bonus of 20% of the time rate
(3) Output above Standard	High piece-rate on Worker's Whole Output

This method serves two purposes; one is to provide an incentive for efficient workers to reach a high level of output as well as to encourage and protect less skilled workers who are unable to complete work in standard time.

(3) Bonus Systems:

(a) Individual Bonus Systems: The individual bonus schemes under the premium bonus system includes:

(i) Halsey Premium Plan: This plan was introduced by F.A.. Halsey an American Engineer in 1891. In this plan, a worker who takes the same time or more than allowed time receives his time rate. In case the job is completed in less than allowed time the worker is paid a fixed percentage of the saving in time. Mostly the percentage is 50% but it varies between 30% to 70% of the time saved. The remaining represents the employers share.

(ii) Halsey-Weir Premium System: This system was introduced by G. and F. Weir Limited in Glasgow in 1900. According to this system the sharing plan is $33\frac{1}{3}\%$ to $66\frac{2}{3}\%$.

(iii) Rowan System: In 1901, David Rowan introduced the premium bonus system in Glasgow. It is similar to the Halsey Plan in respect of time saved but here a different method is used to calculate the bonus. The bonus hours are calculated as the proportion of the time taken with the time saved to the time allowed and the payment is on the basis of time work rates.

(iv) Barth Variable Sharing Plan: This premium bonus system does not guarantee a time rate. In this system payment is proportionately less than output. This scheme is suitable for learners or beginners until they become proficient enough to go to some other scheme.

(v) Emerson Efficiency Bonus System: Emerson chose certain arbitrary points both at low task levels and high task levels. This is a premium bonus system and is similar to piecework system with guaranteed time wages.

(vi) Bedaux Point Premium System: This is a premium bonus system. Under this system standard time is determined by work study; the time unit being the minute. Each minute of allowed time is called "B" the Bedaux Point, thus making 60 units of required work in 1 hour. The points or B's are indicated on each job ticket.

(vii) **Accelerating Premium Plans:** Under these plans bonus increases at a faster rate as compared to increase in the output. This accelerating bonus provides a strong incentive to produce more and more.

(b) Group Bonus System: In many cases output of individual workers cannot be measured conveniently but instead output of a group of workers can be conveniently measured. Under such circumstances group payment by results is used instead of individual bonus plans.

The main group bonus scheme plans are as below:

(i) Budgeted Expense Bonus System: Under this system bonus is based on the savings in actual total expenditure compared with the total budgeted expenditure.

(ii) Cost Efficiency: In the case standards are being set for specific elements of costs, such as material cost, labour cost, overheads and total cost in order to assess the savings in the cost. A portion of such reduction in costs is paid to employees as bonus.

(iii) Priestman System: This system is mostly used in foundries and related works. In this case a production standard in units or points is fixed every month for the entire work. If actual production exceeds this set standard all workers receive during the following month additional pay equal to the percentage in output over standard. If production does not exceed the standard, no bonus is paid, though time rates are guaranteed to workers.

(iv) Towne Gain Sharing Plan: In 1886, Mr. H. R. Towne introduced this group sharing system in U.S.A. The bonus is calculated on the reduction in costs as compared with a pre-determined standard. One-half of the savings is paid to individual workers pro rata with the wages earned.

(v) Waste Reduction Bonus: This bonus system is used in industries where the cost of material is high. The objective of this system is to provide incentive to workers with a view to reduce material waste to the minimum. This scheme takes the form of a percentage payment for specific reduction in waste percentage against a standard.

(vi) Rucker Plan: Under this plan bonus is tied up with 'value added'. Value added is obtained by deducting the purchased cost of materials and services from the sales value. The standards are based on past records. The bonus is computed on a monthly basis. In actual practice only two thirds of the bonus earned is paid as bonus and the balance one-third is transferred to reserve fund to be used in any period in which performance is below standard

(vii) Scanlon Plan: Scanlon plan is similar to Rucker plan but in this case the ratio of labour cost to the sales value of production is used instead of direct labour cost to added value.

(viii) Bonus System for Indirect Workers: Indirect workers provide services to the direct workers. But it is difficult to determine the output of indirect workers and hence it tends them to be excluded from the incentive schemes. This results in labour unrest as a result of paying only the time rate to indirect workers whereas giving bonus to direct workers. In order to avoid such problems bonus is also given to foreman, supervisors, clerical staff and executives also.

(1) Workers working directly with direct workers: In case of Foreman and Supervisors bonus may be based on the output of the direct workers whom they serve. Such indirect workers work directly with the direct workers and it also includes internal transport workers, checkers, inspectors, etc.

(2) Workers providing general services: In case of clerical staff and executives bonus should be determined on a wider basis such as output of the whole factory, bonuses earned by direct producers, job evaluation, etc. Such indirect workers provide some general services and it also includes maintenance workers, canteen workers, sweepers, etc.

(4) Indirect Monetary Incentives:

(i) Profit Sharing Schemes: In profit sharing schemes there is an agreement between the employer and his workers whereby the employer pays them a pre-determined share of the profits of the undertaking alongwith the wages.

(ii) Co-ownership or Co-partnership: In this case the workers get the opportunity to share in the capital of the business and to receive the part of profits that accrue to their share of ownership. In this case employees purchase the companys shares. Due to this scheme the employee morale is increased to a great extent which also helps to reduce the labour turnover.

(5) Non-monetary Incentives: Non-monetary incentives are tied to conditions of employment rather than to the job functions. Such benefits may be provided free or may be partially contributed by the employees. The objectives of non-monetary incentives are to make the conditions of employment more and more attractive and also to promote better health amongst the employees so as to build up a happy and satisfied staff.

The various forms of non-monetary benefits are as follows:

(i) Subsidised meals.
(ii) Free Canteen facilities.
(iii) Medical, health and safety services such as doctor, nursing and first aid.
(iv) General welfare which includes sports and recreation facilities, housing facilities, long service awards, etc.
(v) Housing facilities.
(vi) Educational and training — training school for employees and their children, scholarships and self-education subsidies.
(vii) Pensions, superannuation and life assurance schemes.
(viii) Subsidies to sick.

Frauds in the Payment of Wages:

Frauds committed by the concerned people engaged in calculation and disbursement of wages is one of the problems associated with payment of wages. The following types of frauds are commonly observed:

(1) Inclusion in the payroll of ghost or dummy workers. Dummy workers are workers who do not exist but whose names are fraudulently entered in the payroll.
(2) Inclusion of wrong number of hours worked by employees in the payroll.
(3) Marking an absent worker as present.
(4) Ignoring to mark late arrivals or early departures.
(5) Use of wrong rate of pay in the payroll.

(6) Omission to record deductions, partly or entirely,

(7) Other forms of manipulation in the payment of wages.

HOW TO EXERCISE CONTROL OVER LABOUR COST?

The main aim of the control over labour cost is to keep labour cost per unit of output as low as possible increasing labour productivity. For this purpose, there has to be a concerted effort by all the concerned departments involved in the control of labour cost.

Departments Involved in the Control of Labour Cost

In a large organisation, generally the following departments are involved in the control of labour cost:

Department	Function
1. Personnel Department	(a) Recruitment and selection of workers (b) Training and development of workers (c) Orientation and placement of workers, (d) Maintenance of personnel records.
2. Engineering and Work Study Department	(a) Preparation of plans and specifications for each job. (b) Supervision of production activities within production departments. (c) Maintaining safety and efficient working conditions. (d) Conducting time and motion studies. (e) Conducting job analysis. (f) Conducting job evaluation and merit rating. (g) Setting piece rates,
3. Timekeeping Deprtment	(a) Recording of arrival and departure time of each worker. (b) Recording of time spent by each worker on various jobs, orders or processes.
4. Payroll Department	(a) Preparation and maintenance of payroll record for each employee and department. (b) Issue of pay-slip to each employee (c) Disbursement of salaries and wages.
5. Cost Accounting Department	(a) Classification of labour cost data (b) Collection of labour cost data (c) Charging of direct labour cost to the concerned Department (d) Allocation of individual Indirect labour cost to the concerned (e) Apportionment of common indirect labour cost over various departments on some equitable basis. (f) Absorption of'indirect labour cost over jobs, orders or processes (g) Analysis of Labour Cost Reports such an Idle time Report, Overtime Report, Variances from Budgeted Labour costs.

Important Factors for the Control of Labour Cost

To exercise an effective control over the labour costs, the essential requisite is efficient utilisation; labour and allied factors. The main points which need consideration for controlling labour costs a the following:

1. Assessment of Manpower Requirement.
2. Time-and-motion Study.

3. Job Evaluation and Merit Rating.
4. Labour Productivity
5. Wage Systems.
6. Incentive Systems.
7. Control over Timekeeping and Time Booking,
8. Control over Labour Turnover.
9. Control over casual, contract and other workers.

Meaning of Terms used in Engineering and Work Study Departments

Time Study

1. Meaning	Time study is a technique which is used to measure the time that may be taken by a workman of reasonable skills and ability to perform various' elements of the tasks in a job.
2. Purpose	The purpose of time study is to determine — (i) time normally required to perform a certain job, and (ii) a fair day's work for the workman,
3. Tools	Time study is conducted with the help of stopwatch.

Motion Study

1. Meaning	Motion study is a technique which involves close observation of their movements of body and limbs required to perform a job.
2. Purpose	The purpose of motion study is — (i) to eliminate waste motion, and (ii) to determine the best way of doing a job.
3. Tools	Time study is conducted with the help of a movie camera connected with micro-chronometer (i.e., a kind of clock).
4. Factores	Usually the following factors are considered for merit rating purposes (a) Quality of work done (b) Knowledge applied (c) Skills used (d) Sense of responsibility (e) Sense of judgement (f) Aptitude for work (g) Initiative (h) Integrity (i) Punctuality (j) Reliability (k) Discipline (l) Cooperation
5. Advantages	Advantages of merit rating are as follows: 1. Merit rating helps in determining fair wages for each worker. 2. It helps in taking decisions like who deserves promotion, who deserves increment? 3. It helps in introducing a system for wage payment and incentives. 4. It reveals employee's strong and weak points. 5. It helps in ascertaining the suitability of the worker for a particular job when it is linked with job evaluation.

Distinction between Job Evaluation and Merit Rating

Job Evaluation differs from Merit Rating in the following respects:

Basis of Distinction	Job Evaluation	Merit Rating
1. Meaning	It is the assessment of relative worth of jobs in a job hierarchy.	It is the assessment of the relative worth of a job holder.
2. Job vs. Job holder	It rates the jobs.	It rates the job holders.
3. Objective	Its objective is to set up a rational wage and salary structure.	Its objective is to provide a scientific basis for determining fair wages for each worker based on his ability and performance.
4. Usefulness	It helps in establishing a simplified and rational wage and salary structure.	It helps in determining fair wages for each worker.

Timekeeping

1. Meaning Time keeping is a system of recording the arrival and departure time of each worker.

2. Objective

(a) To provide data for the preparation of payroll.

(b) To meet statutory requirements {i.e.. Attendance Record)

(c) To ascertain the overtime

(d) To ascertain the idle time

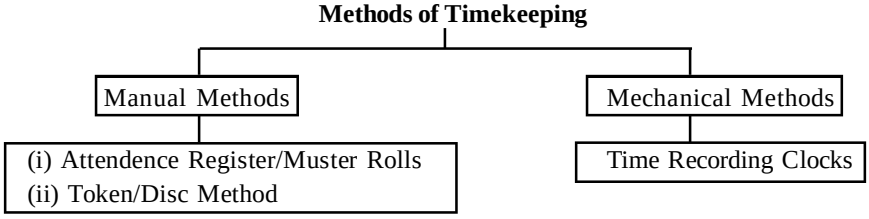
(e) To ascertain the labour cost

(f) To provide a basis for apportionment of overheads if based on labour hours

(g) To control labour cost

(h) To maintain discipline and punctuality among the workers

3. Methods The various methods of Timekeeping are as follows:



Let us discuss these methods one by one.

(a) Attendance Register/Muster Roll

(i) It is kept at the gate of the factory.

(ii) In and out time is recorded in the register either by the timekeeper or the worker.

(iii) It is signed by the worker both at the time of arrival and departure.

(iv) After the fixed reporting time worker are marked ‘late’ or’absent’ as the case may be.

(v) This method is very simple.

(vi) This method is very economical.

(vii) This method is very suitable for small organisations.

(viii) Possibilities of fraudulent marking of attendance due to collusion between worker and time-keeping staff, may not be ruled out.

(b) Token/Disc Method

(i) Each worker is allotted an identification number.

(ii) All tokens or discs bearing identification numbers are hung on a board at the factory gate.

(iii) When the worker arrives, he removes his disc/token from the board and puts in a box kept for the purpose at factory gate.

(iv) After the fixed reporting time, the box is removed and is replaced by another box indicating the extent of late attendance or latecomers may be required to report directly to the Time Keeping Office.

(v) On the basis of Disc/Token put in the box, attendance is recorded in the Attendance Record.

(vi) This method needs proper supervision to ensure that a worker does not put in the box more than one disc/token.

(vii) This method is suitable in small organisations only.

(c) Time Recording Clocks

(i) Each worker is given a clock card bearing an identification number.

(ii) All clock cards are placed in the rack which is kept at factory gate.

(iii) When the worker arrives, he takes his card from the out rack and punches his arrival time with the help of a machine and puts it into the 'In' rack. When the leaves the factory, this process is reversed.

(iv) Advantages of this method are:

(i) It provides accurate and quick recording of attendance

(ii) It helps in reducing the chances of false and fraudulent entries.

(v) Disadvantages of this method are:

(i) It requires heavy capital investment.

(ii) It requires close Supervision to ensure that a worker does not punch more than one clock card.

Time Booking

1. Meaning	Time Booking is a system of recording the time spent by each worker on various jobs, orders or processes.
2. Objective	(a) To ascertain the labour cost of a job, order or process. (b) To check wastage of time by the worker after he enters the factory. (c) To ascertain the cost of idle time. (d) To provide a basis for apportionment of overheads where overheads are to be apportioned on the basis of time spent on various jobs, orders or processes. (e) To control labour cost by comparing actual time with the standard time allowed on various jobs. (f) To provide information for the computation of wages and bonus for the time saved under various schemes of wage payment. (g) To ensure that the time for which a worker is paid is properly utilized.
3. Methods	1. Daily Time Sheet 2. Weekly Time Sheet 3. Job Card 4. Combined Time and Job Card 5. Labour Cost Card 6. Piece Work Card

METHODS OF TIME BOOKING

Depending upon the size of organisation, time booking may be done manually or mechanically. Large sized organisations use time recording clocks for recording starting and closing timings of work by every worker in respect of every job. The other methods of time booking are as follows:

Dailly Time Sheet

1. Meaning	It is a daily record for each worker in respect of time spent by him on each job during the day.
2. Suitability	This method is suitable where workers have to change their jobs quite frequently during a day i.e., maintenance workers.
3. Diadvantage	This method involves a lot of clerical work.

Idle time, overtime, and fringe benefits associated with direct labour workers pose particular problems in aacounting for labour costs. Are these costs a part of the costs of direct labour or are they something else?

- **Idle Time**
- **Overtime**
- **Fringe Benefits**

Idle Time: Machine break downs, materials shortages, power failure, and the like result in idle time. The labor costs incurred during idle time are ordinarily treated as manufacturing overhead cost rather than as a direct labor cost. Most managers feel that such costs should be spread over all the production of a period rather than just the jobs that happen to be in process when breakdown or other disruptions occur.

Example: to give an example for how the cost of idle time is handled, assume that a press operator earns ` 12 per hour. If the press operator is paid for a normal 40- hour workweek but is idle for 3 hours during a given week due to breakdowns, labor Cost would be allocated as follows.

Direct labor ` 12 per hour × 37 hours	` 444
Manufacturing overhead (idle time: ` 12 per hour × 3 hours)	36
Total cost for the week	` 480

Overtime Premium: The overtime premium paid to all factory workers (direct labor as well as indirect labor) is usually considered to be part of manufacturing overhead and is not assigned to any particular order. At first glance this may seem strange, since overtime is always spent working on some particular order. Why not charge that order for the overtime cost? The reason is that it would be considered unfair and arbitrary to charge an overtime premium against a particular order simply because the order happened to fall on the tail end of the daily production schedule.

Example: Assume that a press operator in a plant earns ` 12 per hour. She is paid time and half for over time (time in excess of 40 hours a week). During a given week, she worked 45 hours and has no idle time. Her labor cost would be allocated as follows:

Direct labor (` 12 × 45 hours)	` 540
Manufacturing overhead (overtime premium: ` 6 per hour × 5 hours)	` 30
Total Cost for the week	` 570

Observe from this computation that only the overtime premium of ` 6 per hour is charged to overhead account – not the entire `18 earned to each hour of overtime work (` 12 regular rate × 1.5 = ` 18)

Labor Fringe Benefits: Labor fringe benefits are made up of employment – related costs paid by the employer and include the cost of insurance programs, retirement plans, various supplemental unemployment benefits, and hospitalization plans. The employer also pay employer's share of social Security, Medicare, workers' costs often add up to as much as 30% to 40% of base pay.

Many firms treat all such costs as indirect labor by adding them in total to manufacturing overhead. Other firms treat the portion of fringe benefits that relates to indirect labor as additional direct labor cost. This approach is conceptually superior, since the fringe benefits provide to direct labor workers clearly represent an added cost of their service.

Labor Costing Formulas

Gross pay	Hours worked × rate per hour or number of units produced × rate per unit
Halsey scheme	50% of time saved × rate per hour
Halsey Weir Scheme	1/3 of time saved × rate per hour
Rowan scheme	(time taken/time allowed × time saved) × rate per hour
Time saved	Time allowed – time taken
Labor turnover	Avg no of employees leaving who have to be replaced A × 100 average number employed.

LABOUR TURNOVER

Meaning of Labour Turnover

Labour Turnover is the rate of change in the composition of labour force of an organisation due to retirement, resignation or retrenchment etc. during a particular period. It may be defined as the number of workers left or replaced or both in relation to the average number of workers employed during the period.

Three Methods of Measurement of Labour Turnover

Method	Formula to Measure Labour Turnover
1. Separation Rate Method	$LT = \frac{\text{No. of Separations}}{\text{Average Number of Workers in the period}} \times 100$ Where, No. of Separations = No. of Workers in the bag + $\text{Average No. of Workers} = \frac{\text{No. of Workers at the end}}{2}$
2. Replacement Rate Method	$LT = \frac{\text{No. of Replacements}}{\text{Average Number of Workers in the period}} \times 100$

	Where, No. of Replacements = No of Workers recruited in the vacancies of those leaving excluding those recruited on account of expansion scheme.
3. Flux Method	$LT = \frac{\text{No. of Separations} + \text{No. of Replacements}}{\text{Average No. of Workers in the period}} \times 100$ or, $= \frac{\text{No. of Separations} + \text{No. of Accessions}}{\text{Average No. of Workers in the period}}$ Where, No. of Accessions = No. of Workers recruited in the vacancies of those leaving and those recruited on account of its expansion.

Equivalent Annual Labour Turnover Rate

In case Labour Turnover Rate is based on a period other than a year, An Equivalent Annual Labour Turnover Rate may be calculated as follows:

$$\text{Equivalent Annual Labour Turnover Rate} = \frac{\text{Turnover rate for the period}}{\text{Number of days in the period}} \times 365$$

Illustration 1

the extracts from the payroll of a factory is a follows:

Number of Employees at the beginning of April 20 × 5	150
Number of Employees at the end of April 20 × 5	250
Number of Employees resigned during April 20 × 5	25
Number of Employees discharged during April 20 × 5	5
Number of Employees replaced due to resignations and discharges during April 20 × 5	20

Required: Calculate the labour turnover rate and equivalent annual rate for the factory by different methods.

Solution

1. $$\text{Separation Rate Method} = \frac{\text{Number of Separation}}{\text{Average No. of Workers}} \times 100$$

$$= \frac{25+5}{(150+250)/2} \times 100 = 15\%$$

$$\text{Equivalent Annual Labour Turnover Rate} = \frac{\text{Turnover rate for the period}}{\text{Number of days in the period}} \times 365$$

$$\text{Equivalent Annual Labour Turnover Rate} = \frac{15\%}{30} \times 365 = 182.5\%$$

2. $$\text{Replacement Method} = \frac{\text{No. of Replacements}}{\text{Average No. of Workers}} \times 100 = \frac{20}{200} \times 100 = 10\%$$

$$\text{Equivalent Annual LAabour Turnover Rate} = \frac{10\%}{30} \times 365 = 121.67\%$$

3. $$\text{Flux Rate (i)} = \frac{\text{No. of Separations} + \text{No. of Replacements}}{\text{Average No. of Workers}} \times 100$$

$$= \frac{30 + 20}{200} \times 100 = 25\%$$

$$\text{Flux Rate (ii)} = \frac{(\text{No. of Separations} + \text{No. of Replacements})/2}{\text{Average No. of Workers}} \times 100$$

$$= \frac{(30 + 20)/2}{200} \times 100 = 12.5\%$$

$$\text{Equivalent Annual Labour Turnover Rate} = \frac{25\%}{30} \times 365 = 304.17\%$$

Illustration 2

Calculate the number of employees in the beginning and at the end of the year from the following information:

Labour Turnover Rate 3% Number of Separations during the year 12

No. of Employees at the end were 100 in excess of number of employees in the beginning.

Solution

$$\text{Labour Turnover Rate} = \frac{\text{No. of Separations}}{\text{Average No. of Employess}} \times 100$$

$$3 = \frac{12}{\text{Average No. of Employess}} \times 100$$

$$\text{Average No. of Employess} = \frac{12}{.03} = 400$$

$$\frac{OE + CE}{2} = 400$$

OE + CE = 800 ....(I)

CE – OE = 100 ....(II)

Adding both the equations:

2CE = 900

CE = 900/2 = 450

OE = 450 – 100 = 350

Thus, the number of employees in the beginning 350.

Illustration 3

Calculate the number of separations during the year from the following information:

Labour Turnover Rate (based on Separation)	10%
Labour Turnover Rate (based on Replacement)	8%
No. of Replacements during the year	16

Solution

Step 1 → Calculation of Average No. of Employees

$$\text{Labour Turnover Rate (based on Replacements)} = \frac{\text{No. of Replacements}}{\text{Average No. of Employees}} \times 100$$

$$8 = \frac{16}{\text{Average No. of Employees}} \times 100$$

$$\text{Average No. of Employees} = \frac{16}{08} = 200$$

Step 2 → Calculation of No. of Separations

$$\text{Labour Turnover Rate (based on Replacements)} = \frac{\text{No. of Replacements}}{\text{Average No. of Employees}} \times 100$$

$$10 = \frac{\text{No. of Separations}}{200} \times 100$$

No. of Separations during the year = 10% of 200 = 20

Illustration 4

Calculate the number of workers replaced from the following information:

Labour Turnover Rate (bsed on seprations)	3%
Labour Turnover Rate (bsed on flux)	8%
No. of workers left & discharged	18

Solution

Step 1 → Calculation of Average No. of Workers

$$\text{Labour Turnover Rate (based on separations)} = \frac{\text{No. of Separations}}{\text{Average No. of Workers}} \times 100$$

$$3 = \frac{18}{\text{Average No. of Workers}} \times 100$$

$$\text{Average No. of Workers} = \frac{18 \times 100}{3} = 600$$

Step 2 → Calculation of No. of Replacements

$$\text{Labour Turnover Rate (Flux Method)} = \frac{\text{No. of Separations} + \text{No. of Replacements}}{\text{Average No. of Workers}} \times 100$$

$$8 = \frac{18 + \text{No. of Replacements}}{600} \times 100$$

No. of Replacements = 48 – 18 = 30

Illustration 5

The cost accountant of Y Ltd. has computed labour turnover rates for the quarter ended 31st March, 20 × 1 as 10%, 5% and 3% respectively under 'Flux Method', 'Replacement method' and 'Separation Method'. If the number of workers replaced during that quarter is 30. Find out the number of (a) workers left and discharged and (b) workers recruited and joined.

Solution

Step 1 → Calculation of Averge number of workers on roll

Labour Turnover Rate

$$\text{(Under Replacements Method)} = \frac{\text{No. of Replacements}}{\text{Average No. of Workers on Roll}} \times 100$$

or,
$$5 = \frac{30}{\text{Average No. of Workers on Roll}} \times 100$$

or,
$$\text{Average No. of Workers on Roll} = \frac{30 \times 100}{5} = 600$$

Step 2 → Calculation number of workers left and discharged Labour Turnover Rate

$$(\text{Under Separations Method}) = \frac{\text{No. of Separations (S)}}{\text{Average number of Workers on Roll}} \times 100$$

$$3 = \frac{S}{600} \times 100$$

or, $S = 18$

Hence, number of workers left and discharged comes to 18.

Step 3 → Calculation number of workers recruited and joined

Labour Turnover Rate

$$(\text{Flux Method}) = \frac{\text{No. of Separations (S)} + \text{No. of Accession (A)}}{\text{Average No. of Workers on Roll}} \times 100$$

or, $10 = \frac{18 + A}{600} \times 100$

or, $A = (60 - 18) = 42$

No. of workers recruited and joined = 42

Illustration 6

From the following data provided to you, find out the Labour Turnover Rate by applying:

(a) Flux Method

(b) Replacement Method

(c) Separation Method

No. of workers on the payroll:

At the beginning of the month	500
At the end of the month	600

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

Solution

Computation of Labour Turnover Rate

(a) Flux Method $= \frac{\text{No. of Separations} + \text{No. of Accessions}}{\text{Average Number of Workers in Period}} \times 100$

$$= \frac{5 + 20 + 75}{(500 + 600)/2} \times 100 = \frac{100}{550} \times 100 = 18.18\%$$

(b) Replacement Method $= \frac{\text{No. of workers replaced during the period}}{\text{Average Number of Workers in Period}} \times 100$

$= \frac{10}{(500+600)/2} \times 100 = 1.82\%$

(c) Separation Method $= \frac{\text{No. of Separations during the period}}{\text{Average Number of Workers in the Period}} \times 100$

$= \frac{5+20}{(500+600)/2} \times 100 = 4.545\%$

Three Types of Causes of Labour Turnover

Type of Causes	Examples
1. Personal Causes These include those causes which induce or comple workers to leave their jobs.	(i) Change of jobs for betterment (ii) Premature retirement due to jll health or old age. (iii) Domestic problems and famillly responsiblities. (iv) Discontent over the jobs and working environment.
2. Unavoidable Causes These include those causes which are not within the control of the management.	(i) Seasonal nature of the business; (ii) Shortage of raw material, power, slack market for the product etc; (iii) Change in the plant location; (iv) Disabilit, making a worker unfit for work; (v) Disciplinar measures; (vi) Marriage (generall in the case of women).
3. Avoidable Causes There include those causes which are within the control of the management and which require the attention of management on a continuous basis so as to keep the labour turnover ratio as low as possible.	(i) Dissatisfaction with job, remuneration, hours of work, working conditions, etc., (ii) Strained relationship with management, supervisors or fellow workers; (iii) Lack of traning facilities and promotional avenues; (iv) Lack of recreational and medical facillities; (v) Low wages and allowances.

Effects of High Labour Turnover

High Labour Turnover increases the cost of production and decreases the profitability because of —

1. Loss of Output between the time when workers left and new workers recruted
2. Increased Cost of Selection and recruitment
3. Increased Cost of Training
4. Increased Cost of Tools, Equipments and machine breakages

Cost of Labour Turnover

	Preventive Costs	Replacement Costs
(1)	Personnel Administration	(1) Cost of recruitment
(2)	Medical services	(2) Training
(3)	Canteen Meals	(3) Induction
(4)	Sports and Welfare	(4) Tools and Machine breakage
(5)	Gratuity	(5) Additional Supervision
(6)	Pension Schemes	(6) Scrap
(7)	Bonuses	(7) Defective Work
(8)	Perquisities	
	Preventive cost are distributed to different departments in proportion of labour strength.	Replacement costs are Directly charged to the department where replacement take place

Effects of Labour Trunover

(1) Inflationary Trend

(2) Against the goal of full employment

Illustration 7

If the standard time is 10 hours, the premium 50% of time saved and the hourty wage rate is ` 200. Calculate the effective hourly rate earned by a worker under the Halsey system, if the time taken by the worker is 8 hours for the job.

Solution

Standard Time	10 Hours
Actual Time Taken	8 hours
Time Saved	2 hours

Particulars

(1)	Wage for Time Taken (8 Hrs × ` 2000 per hour)	16,000
(2)	Bonus 50% of time saved (2 Hours × $\frac{50}{100}$ × ` 2000 per hour)	2000
	Total	18,000

Illustration 8

Calculate the Standard Labour hour rate for workemn of Grade III, form the following data.

Basic Pay	` 200 per mensem
DA	` 150 per mensem
Fringe Benefit	` 100 per mensem
Number of Working days per year	300

Leave Rules

30 Days PL with full pay.

20 Days SL with half pay

Usually SL is fully availed of, what then would be the labour cost per hour if no SL is availed of during the year?

Solution

Particulars	Per Month (`)	Per Year (`)
Basic pay	200	2,400
DA	150	1,800
Fringe Benefits	100	1,200
Total	450	5,400

Less: SL of 20 Day

$\frac{450}{30} \times 20 \times \frac{1}{2}$ = 150

Total = 5,250

Effective Working Days = 300 – 30 – 20 = 250

Standard Labour Rate (Assumption of 8 hours day)

$= \frac{5,250}{250 \times 8} = 2.625$

If no SL is availed, the labour rate is

$\frac{5,400}{270 \times 8} = \frac{5,400}{2,160} =$ `.2.50

Illustration 9

A worker takes 9 hours to complete a job on daily wages and 6 hours on a scheme of payment by results. His day rate is ` 100 per hour, the material cost of the product is ` 400 and the overheads are recovered at 150% of the total direct wages.

Calculate the factory cost of the product under:

(a) The Piece Work Plan;

(b) The Rowan Plan; and

(c) The Halsey Plan.

Solution

(a) Under Piece Work Plan

For 9 hours @ ` 100 = ` 900

(b) Under Rowan Plan

$$\text{Time Taken} \times \text{Rate per Hour} + \frac{\text{Time Taken}}{\text{Standard Time}} \times \text{Time Saved} \times \text{Rate}$$

Time Taken = 6 hours

Rate per Hour = ` 100

Standard Time = 9 hours.

Time Saved = 9 hours – 6 hours = 3 hours

$$= 6 \times 75 + \frac{6}{9} \times 3 \times 75$$

= 600 + 200

= ` 800

(c) Under Halsy Plan

Timetaken × Rate oer hour + 50% of Time Saved × Rate per hour

= 6 × 100 + (----------) × 100

= 600 + 150

= ` 750

Statement of Factory Cost

Items	Piece Rate (`)	Rowan Plan (`)	Halsey Plan (`)
Materials	400.00	400.00	400.00
Direct Wages	900.00	800.00	750
Prime Cost	1,300	1,200.00	1150
Add. Factory overheads			
(150% of Direct Wages)	1,350	1,200	1125
Factory Cost	2,650	2,400	2271

Illustration 10

You are required to ascertain the wages paid to workers X and Y under the Taylor's System.

Given,

Standard time allowed = 100 units per hour.

Normal Wage Rate = 10 per hour

Differential rates to be applied:

75% of piece rate when below Standard and 125% of piece rate when at or above standard. The workers have produced (in a day of 8 working hours) units as follows:

X 300 Units

Y 450 Units

Solution

Standard Production in 8 hours

= 8 × 100 = 800 Units

Normal Wage rate at ` 10 per hour

$$\text{Normal Wage rate per unit} = \frac{10}{100} \text{ ` } 0.10$$

Worker X: Below Standard

$$\text{Wages} = 300 \text{ Units} \times 0.10 \times \frac{75}{100} = \text{ ` } 22.50$$

Worker Y: Above Standard

$$\text{Wages} = 450 \text{ units} \times 0.10 \times \frac{125}{100} = \text{ ` } 56.25$$

Illustration 11

A worker takes 18 hours to complete a job on daily wages and 12 hours on a scheme of payment of results. His daily rate is 75 paise per hour. Calculate the eaenings of the worker under: (a) The piece work (ii) The hasley plan and (c) The rowan plan

Solution

(a) Piece Work Plan

For 18 hours @ 0.75 per hour = ` 13.50

(b) Halsey Plan

$$\text{Time Taken} \times \text{Rate per hour} + \frac{\text{Time Taken}}{\text{Standard Time}} \times \text{Time Saved} \times \text{Rate per hour}$$

$$= 12 \times 0.75 + \frac{12}{18} \times (18 - 12) \times 0.75$$

= 9 + 3

= ` 12

(c) Halsey Plan:

Time Taken × Rate per Hour + 50% of Time Saved × Rate per Hour

$$= 12 \times 0.75 + \left[\frac{50}{100} \times (18 - 12)\right] \times 0.75$$

= 9 + 2.25

= ` 11.25

Illustration 12

From the given information, calculate the wages payable to a worker under the:

(a) The Gantt Task and Bonus Plan;

(b) The Halsey Premium Bouns, and

(c) The Rowan Bonus Plan.

Time allowed	6 hours
Time taken	5 hours
Rate per hour	` 200

Solution

(a) Gantt Taks and Bonus Plan:

$$\text{Efficiency Ration} = \frac{\text{Time Allowed}}{\text{Time Taken}} \times 100$$

$$= \frac{6}{5} \times 100$$

= 120%

Particulars	`
(1) Wages = Actual Time × Rate = 5 × 20 =	1000
(2) * Bonus @ 20% of Actual Wages $= 100 \times \frac{20}{100} =$	20
Total Wages	120

***** **Note:** No Bonus is paid if efficiency is less than 100%.

(b) Halsey Premium Bonus Plan:

Hours Worked × Rate per hour + 50% of time saved × Hourly Rate

$$5 \times 20 + \left[\frac{50}{100} \times (6-5)\right] \times 20$$

= 100 + 10

= ` 110

(c) Rowan Bonus Plan

$$\text{Bonus Ratio} = \frac{\text{Time Saved}}{\text{Time Allowed}}$$

$$= \frac{1}{6}$$

Time Taken × [Hourly Rate + (Hourly Rate × Bonus Ratio)]

$$= 5 \times \left[200 + \left(200 \times \frac{1}{6}\right)\right]$$

$= 5 \times 233.33$

$= ` 1,166.67$

Illustration 13

(MU, B.Com.; Modified)

From the following particulars, calculate the monthly wages of workers A, B and C.

(a)	Worker's monthly standard output:	1,000 units.
(b)	Worker's actual output in a month:	A 850 units; B 720 units and C 960 units.
(c)	Rate per unit of actual output:	` 20 paise.
(d)	Dearness allowances per month:	` 50 (Fixed).
(e)	House rent allowance per month:	` 20 (Fixed).
(f)	Travelling allowance per month:	` 20 (Fixed).
(g)	Additional output bonus –	output exceed 80% of standard, for every one per cent of the actual output: ` 5.

Solution

Monthly Standard output = 1,000 Units.

A's output = 850 units

$$\% = \frac{850}{1{,}000} \times 100 = 85\%$$

B's output = 720 units

$$\% = \frac{720}{1{,}000} \times 100 = 72\%$$

C's output = 960 units

$$\% = \frac{960}{1{,}000} \times 100 = 96\%$$

Calculation of Total Monthly Wages

Particulars	A (850 units) `	B (720 units) `	C (960 units) `
(1) Wages @ 20 per unit	170	144	192
(2) Dearness Allowance (Fixed)	50	50	50

(3) HRA (Fixed)	20	20	20
(4) T.A. (Fixed)	20	20	20
(5) Bouns:			
A (85 – 80%) × ` 5			
C (96 – 80% × ` 5	25	–	80
Total	**285**	**234**	**362**

Illustration 14

(ICWA Modified)

XYZ Ltd. employs its workers for a single shift of 8 hours for 25 days in a month. The company has recently fixed the standard output for a mass produced an incentive scheme to boost output.

Details of wages payable to the workers are as follows:

(i) Basic wages/piece work wages @ ` 2 per unit subject to a guaranteed minimum wages of ` 60 per day.

(ii) Dearness allowance at ` 40 per day.

(iii) Incentive bonus:

Standard output per day per worker: 40 units;

Incentive bouns upto 80% Efficiency: NIL;

Incentive bonus for efficiency above 80%: ` 50 for every 1% increase above 80%.

The details of performance of four workers for the month of April 2012 are as follows:

Worker	No. of Days Worked	Output (Units)
A	25	820
B	18	500
C	25	910
D	24	780

Calculate the total earnings of each of the workers.

Solution

Statement of Gross Earnings

Worker (Days)	Days Worked (Units)	Output `	Basic Wages `	DA `	Incentive `	Gross Earnings
A	25	820	1,640	1,000	50 × 2 = 100	2,740
B	18	500	1,080*	720	NIL	1,800
C	25	910	1,820	1,000	50 × 11 = 550	3,370
D	24	780	1,560	960	50 × 1 = 50	2,570
*B: ` 60 per day × 18 days						= ` 1,080 (Higher)
				` 2 × 500 units		= ` 1,000

Working Note: Incentive

A $\frac{820}{25\times40}\times100=\frac{820}{1{,}000}\times100=82.00\%$

B $\frac{500}{18\times40}\times100=\frac{500}{720}\times100=69.44\%$

C $\frac{910}{25\times40}\times100=\frac{910}{1{,}000}\times100=91.00\%$

D $\frac{780}{24\times40}\times100=\frac{780}{960}\times100=81.25\%$

Illustration 15

(CA Modified)

A worker produced 200 units in a week's time. The guaranteed weekly wage payment for 45 hours is ` 81. The expected time to produce one unit is 15 minutes which is raised further by 20% under the incentive scheme. What will be the earnings per hour of that worker under Halsey (50% sharing) and Rowan bonus schemes?

Solution

(i) Halsey (50% sharing) Bonus Scheme

Time allowed for actual weekly production

= 200 Units × 18 Minutes

= 3,600 Minutes

i.e. $=\frac{3{,}600\,\text{Minutes}}{60\,\text{Minutes}}=60\,\text{Hours.}$

Expected time to produce one unit under incentive scheme

= 15 + (15 × 20%)

= 15 + 3

= 18 Minutes

Time Saved = Time Allowed – Actual Time Taken

= 60 Hours – 45 Hours = 15 Hours

Total Eaenings = (Hours Worked × Rate per hour) + $\frac{1}{2}$ × (Time Saved × Rate per hour)

= (45 hours × ` 1.80) + $\frac{1}{2}$ (15 hours × ` 1.80)

= 81 + 13.50 = ` 94.50

Eaening per hour = $\frac{94.50}{45\,\text{Hours}}$ ` 2.10 per hour

Wage Rate per hour = $\frac{81}{45\,\text{Hours}}$ = ` 1.80

(ii) Rowan Bonus Scheme

Total Earnings = Hours Worked × Rate per hour + $\left(\frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time Take} \times \text{Rate per hour}\right)$

= 45 hours × ` 1.80 + $\left(\frac{15\,\text{Hours}}{60\,\text{Hours}} \times 45\,\text{hour}\,1.80\right)$

= 81 + 20.25

= ` 101.25.

Earnings per hour = $\frac{101.25}{45\,\text{Hours}} = 2.25\,\text{per hour.}$

Illustration 16

(CA Modified)

Calculate the earnings of Workers A, B and C under Straight Piece Rate System and Merrick's Multiple Piece Rate System from the following particulars:

Normal Rate per hour:	` 5.40
Standard Time per hour:	1 minute
Output per day is as follows:	
Worker A	390 Units
Worker B	450 Units
Worker C	600 Units

Working hours per day are 8.

Solution

(1) Normal Wage Rate per unit

Normal Rate per hour: ` 5.40

Standard Output per hour: 60 units

Normal Wage rate per unit = $\frac{5.40}{60}$ = ` 0.09 per unit.

(2) Efficiency Level:

$$\text{Efficiency Level} = \frac{\text{Actual Output per day (units)}}{\text{Standard output per day (units)}} \times 100$$

A $\frac{390}{480} \times 100$ = 81.25%

B $\frac{450}{480} \times 100$ = 93.75%

C $\frac{600}{480} \times 100$ = 125%

Statement of Earnings of Workers(under Straight Piece Rate System)

Worker	Units	Normal Wags Rate per hour (`)	Total (`)
A	390	0.09	35.10
B	450	0.09	40.50
C	600	0.09	54.00

Statement of Earnings of Workers (under Merrick's Multiple piece Rate System)

Usual applicable Wages Rates are:

(a) Upto 83% Efficiency — Ordinary Piece Rate i.e. ` 0.09

(b) 83% to 100% — 110% of Ordinary Piece Rate i.e. ` 0.09 × 110% = ` 0.099

(c) Over 100% — 120% Ordinary Piece Rate i.e. ` 0.09 × 120% = ` 0.108

Worker Level	Efficiency `	Wage Rate	X	Units	=	Total Earnings `
A	81.25%	0.09	X	390	=	35.10
B	93.75%	0.099	X	450	=	44.55
C	125%	0.108	X	600	=	64.80

QUESTIONS FOR SELF-PRACTICE

(I) Theory Question

(1) How is labour turnover measured?

(2) Explain the various methods of labour remuneration.

(3) What are the merits and demerits of Time Rate system and Piece rate system of labour remmuneration?

(4) Writer Short Notes on:

(1) Direct and Indirect Labour Cost.

(2) Labour Turnover.

(3) Overtime v/s ldle Time

(II) Practical Questions

(1) Calculate monthly remuneration of X, Y and Z.

Standard production per worker per month 1000 units.

Actual production X – 800 units, Y – 700 units, Z – 900 units during the month.

Piece Work rate p.u. of actual production 15 paise.

Deamess allowance	` 40 p.m. (fixed).
House Rent Allowance	` 20 p.m.

Actual production bonus @ ` 5 for each % of actual production exceeding 75 actual production over standard production.

(2) From the following find out the labour hour rate

(a) Number of hours work per day 8.

(b) Total number of workers in the department 500.

(c) Out of 300 working days, 2.5% is treated to be idle time.

(d) Total Works overheads for the department 25 Lakhs.

(e) Sunday holiday and during the year the company declared 8 holidays.

(3) The following details are given to you regarding a particular Job.

Monthly Working Hours	192 Hours.
Hourly Wage Rate	` 30.
Piece Rate per unit	` 12.
Normal time taken per unit	96 minutes.
Normal output per month	480 units.
Actual Output per month	600 units.

You are required to calculate for the month.

(a) Normal piece-rate method.

(b) Merrick's differential piece rate method.

(c) Halsey Premium Plan.

(d) Halsey-Weir Premium Plan.

Further, which of these methods are beneficial for the worker and for the management.

(4) What will be the earnings of a worker at ` 8 per hour when he takes 140 hours to do a volume of work for which the standard time is 200 hours? The plan of payment of hours is on a sliding scale as given under:

(a) within the first 10% saving in standard time, bonus is 40% of time saved;

(b) within the second 10% saving in standard time, bonus is 50% of time saved;

(c) within the third 10% saving in standard time, bonus is 60% of time saved;

(d) within the fourth 10% saving in standard time, bonus is 70% of time saved; and

(e) for the rest, bonus is 75% of time saved.

(5) From the following data, prepare a statement showing the cost per day of 8 hours of engaging a particular type of labour:

(a)	monthly salary (basic + DA)	` 5,000;
(b)	leave salary payable to the workers	5% of the basic;
(c)	employer's contribution to PF	10% of basic;
(d)	employer's contribution to state insurance	2% of total salary; and
(e)	number of working hours in a month	200

(6) In a company, a daily wage rate guaranteed to a worker is ` 50 and the standard output fixed for the month is 500 articles representing 100% efficiency. The daily wage rate is paid to those workers who show up to 66 2/3% of the efficiency standard.

Beyond this, there is a bonus payable on a graded scale.

Up to 90% efficiency	10% bonus payable
Up to 100% efficiency	20% bonus payable.

Further increase of 1 for every 1 further rise in efficiency.

Fnd out the total earnings of X, Y and Z (workers) who have worked for 26 days in a month. Their output for the month is as follows:

X	400 articles;
Y	500 articles; and
Z	200 articles.

(7) In a factory where the Rowan Plan is introduced, workers X and Y can earn ` 320 and ` 337.50 respectively on a job for which the standard time fixed is 12 hours.

The rate is ` 30 per hour. Calculate what would be their earnings, if the Halsey Plan on a 5:5 basis had been allowed.

(8) From the particulars given below, prepare the labour cost per man day of 8 hours;

(a) Basic salary - ` 40 per day.

(b) Deamess allowance ` 5 per every point over 100 cost of living index = 700 points;

(c) Leave salary = 100% of (a) and (b);

(d) Employer's contribution to PF = 10% of (a), (b), (c);

(e) Employer's contribution to state insurance = 2.5% of (a), (b), (c);

(f) Expenditure on amenities to labour = ` 200 per head per month; and

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

(9) The following information was collected from the books of Simren Ltd. for the year ending 31 Oecember, 2008.

Particulars	`	`
Sales	28,00,000	
Less: Variable costs		
Materials	6,01,000	
Direct labour	5,19,000	
Factory overheads	3,20,000	
Sales overheads	1.90,000	16,30,000
	11,70,000	
Less: Fixed overheads		5,30,000
Profit		6,40,000

Actual number of hours of direct labour = 2,06,000 (which include 4,000 hours of training, half of which is unproductive). Due to delay in filling vacancies, 6,000 potential direct hours were lost.

Cost of re-employment - separation cost ` 25,630; selection cost ` 32,080; recruitment cost ` 23,140; and training cost ` 31,160. Calculate profit lost due to labour turnover.

(10) In an engineering factory, the standard time for a job is 16 hours and the basic wage is ` 25 per hour. A bonus scheme is instituted so that the worker is to receive his normal rate for the hours actually worked and 50 for the hours saved. Materials for the job cost `. 500 and overheads are charged on a basis of ` 50 per labour hour. Calculate the wages and effective rate of earning per hour if the job is completed (i) in 12 hours and (ii) in 14 hours. Also ascertain factory cost of the job on the same basis.

(11) A factory department has 180 workers who are paid at an average of ` 17.50 per week (48 hours), dearness allowance per month (208 hours of `.130), provident fund deduction is at 8 on gross, of which 1 is for the family pension fund of half the number of workers, and employees' state insurance is at ` 1.25 for each. The company gives only a minimum bonus of 81/3 and allows statutory leave of two weeks per year with pay. Show the weekly wage summary for the financial books and the departmental labour hour cost for job costing.

(ICWA)

(12) Calculate the earnings of workers X and Y under the Straight Piece Rate System and the Taylor's Differential Piece Rate System from the following particulars:

Normal rate per hour ` 18.00

Standard time per unit 20 seconds

Differential Rates to be applied:

80% of piece rate below standard

120% of piece rate at or above standard.

Worker X produced 1,300 units per day (of 8 hours) and worker Y produces 1,500 units per day (of 8 hours).

(13) Rolland Ltd., operates, in one of its departments, a group incentive scheme. A minimum hourly rate is guaranteed to each of the six employees in the group if actual output for the week is less than the standard output. If actual output is greater than the standard output, the hourly rate of each employee is increased by 4% for each additional 600 units of output produced. The hgstandard output for the group is 12,000 units for a 40 hour week.

During the week ending 31 December 2007, each employee in the group worked 40 hours and the actual output and minimum hourly rates were as follows:

Employees	Actual Output (in units)	Minimum hourly rate (`)
Lal	2,500	0.60
Hari	2,700	1.00
Mohan	2,400	0.60
Shyam	2,500	0.80
Hanuman	2,460	0.60
Krishna	2,440	0.40

You are required to:

(a) Calculate the earnings of each employee; and

(b) Appraise the effectiveness of the company of this group incentive scheme.

(CA, Adapted)

(14) The standard hours of Job "A" is 100 hours. The job can be completed by A in 60 hours, B in 70 hours and C in 95 hours.

The bonus system applicable to the job is as follows:

Percentage of time saved to time allowed	**Bonus%**
Savings up to 10	10 of time saved
11-20	15 of time saved
21- 40	20 of time saved
41-100	25 of time saved

Rate 6f pay is ` 15 per hour. Calculate the total earnings of each worker and also the rate of earnings per hour.

(15) Two workers 'A' and 'B' produce the same product using the same material. Their normal wage rate is also the same. 'A' is paid bonus according to Rowan scheme while 'B' is paid bonus according to Halsey scheme. The time allowed to make the product is 50 hours. 'A' takes 30 hours while 'B' takes 40 hours to complete the product. The factory overhead rate is ` 5 per person-hour actually worked. The factory cost of product manufactured by 'A' is ` 3,490 and tor product manufactured by 'B' is ` 3,600.

Required:

(i) Compute the normal rate of wages.

(ii) Compute the material cost.

(iii) Prepare a statement comparing the factory cost of the product as made by two workers.

(CA, Adapted)

(III) Objective Questions

(I) State Whether the following Statements are True or False.

(1) Wage plan promotes industrial peace.

(2) Cost of living is increasing due to inflation.

(3) Dearness allowance is linked with cost of living index.

(4) Medical facilities are monetary benefits.

(5) Time rate method remunerates the workers on the basis of time taken on the job.

(6) Piece rate method brings down productivity.

(7) Piece rate method pays the workers by results.

(8) Labour is most important factor of production.

(9) Taylor's differential piece rate system does not differentiate the workers.

[Ans: True: [1,2,3,5,6,8). False: (4,7,9)]

(II) Match the Following.

Group A	Group B
(1) Labour Unions	(i) Monetary benefits
(2) Basic Wages	(ii) Non-monetary benefits
(3) Subsidised Transition	(iii) Greater bargaining power
(4) Dearness Allowance	(iv) Element of labour cost
(5) Time Rate	(v) Wages based on time taken
	(vi) Wages based on output

[Ans. (1 – iii), (2 – i), (3 – ii), (4 – iv), (5 – v)]

(III) Multiple Choice Questions. Select the Right Answer.

(1) The method of remuneration to give stability of labour cost of the employers is

(i) straight piece work

(ii) premium bonus

(iii) measured day work

(2) The following is the most relevant use of the clock card

(i) to measure employee efficiency

(ii) to facilitate payment for the time spent on the work premises

(iii) to calculate bonus payment

(3) Under Halsey Premium Plan, _____% of time sais shared by employer

(i) 110

(ii) 115

(iii) 50

(4) A worker has a time rate of ` 15 per hour. He makes 720 units of a component (standard time 5 minutes per unit) in a week of 48 hours. His total wages including Rowan Bonus for the week is

(i) ` 792

(ii) ` 820

(iii) ` 840

(iv) ` 864

(5) The standard time required per unit of a product is 20 minutes. In a day of 8 working hours, a worker gives an output of 30 units. If he gets a time rate of ` 20 per hour, his total earnings under Halsey Plan was

(i) ` 200

(ii) ` 192

(iii) ` 180

(iv) ` 160

[Ans. (1 - iii), (2 - ii), (3 - iii), (4 - iv), (5 - iii)]

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