

EMPLOYEE COST

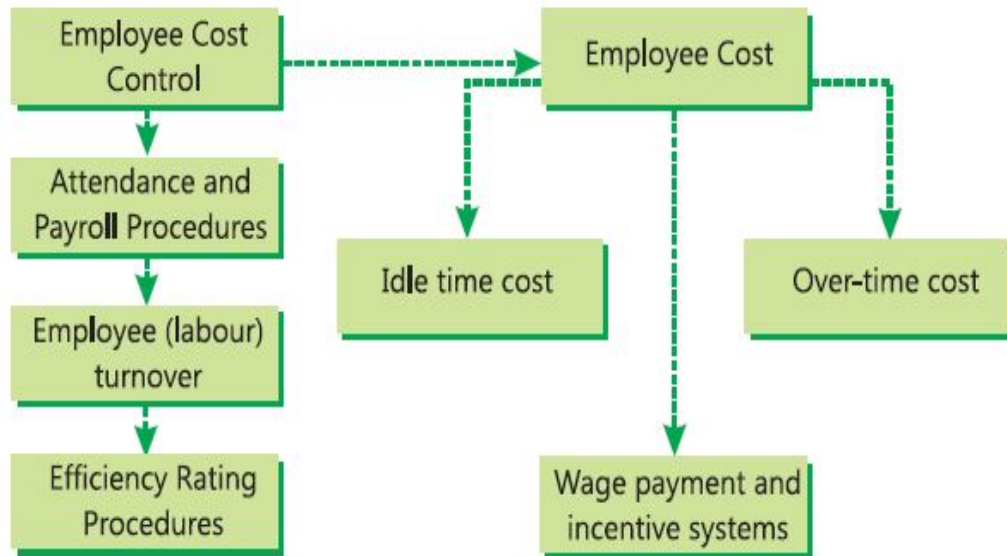


LEARNING OUTCOMES

After studying this chapter, you would be able to-

- ❑ State the meaning and importance of employee (labour) cost in an organisation.
- ❑ Discuss the attendance and payroll procedures.
- ❑ State the meaning and treatment of idle time and overtime cost.
- ❑ Compute employee (labour) turnover discuss its meaning, reasons, methods of measurement and cost impacts.
- ❑ Discuss and apply the various methods of remuneration and incentive system in calculation of wages, bonus etc.
- ❑ Discuss the efficiency rating procedures.

CHAPTER OVERVIEW



3.1 INTRODUCTION

To manufacture a product or to make provision for service, the role of human exertion is inevitable. The term used for *human resources may include workers, employees, labourers, staffs etc.* Whatsoever nomenclature may be used to denote them; they are required to be compensated for their exertions. *The compensation so paid, either in monetary terms or in kind and facility is known as wages.* Cost of paying wages to workers is popularly known as labour cost as it relates to labour (exertion) they put for manufacturing of product or provision of services; hence, employee cost is also interchangeably known as labour cost. In a nutshell, **employee cost is wider term which includes wages, salary, bonus, incentives etc. paid to an employee and charged to a cost object as labour cost.**

Unlike other costs, employee costs are influenced by human behavior. Due to this peculiarity, divergence in employee compensation is observed across the different industries. Wages are determined on both quantitative and qualitative factors like volume of work, skills required etc. Hence, it is necessary that employees should be monitored, measured, and compensated appropriately to achieve economy in cost, efficiency in performance and effectiveness in desired output.



3.2 EMPLOYEE (LABOUR) COST

Employee (Labour) cost: Benefits paid or payable to the employees of an entity, *whether permanent, or temporary* for the services rendered by them. Employee cost includes payments made *in cash or kind*. Employee cost includes the following:

- (i) Wages and salary;
- (ii) Allowances and incentives;
- (iii) Payment for overtimes;
- (iv) Employer's contribution to Provident fund and other welfare funds;
- (v) Other benefits (leave with pay, free or subsidised food, leave travel concession etc.) etc.

Classification of Employee (Labour) cost: Employee cost are broadly classified as direct and indirect employee cost.

(i) Direct Employee (Labour) Cost

Benefits paid or payable to the employees **which can be attributed to a cost object** in an economically feasible manner. This can be easily identified and allocated to an activity, contract, cost centre, customer, process, product etc.

(ii) Indirect Employee (Labour) Cost

Benefits paid or payable to the employees, **which cannot be directly attributable to a particular cost object** in an economically feasible manner.

Distinction between Direct and Indirect Employee Cost:

Direct employee cost	Indirect employee cost
1. It is the cost incurred in payment of employees who are directly engaged in the production process .	1. Cost incurred for payment of employee who are not directly engaged in the production process .
2. Direct employee cost can be easily identified and allocated to cost unit.	2. Indirect employee cost is apportioned on some appropriate basis.
3. Direct employee cost varies with the volume of production and has positive relationship with the volume.	3. Indirect employee cost may not vary with the volume of production .



3.3 EMPLOYEE (LABOUR) COST CONTROL

Employee costs are associated with human beings. To control employee costs one has to understand human behavior. Employee cost control means control over the cost incurred on employees. Control over employee costs does not imply control over the size of the wage bill; it also does not imply that wages of each employee should be kept as low as possible.

The aim should be to keep the wages per unit of output as low as possible.

This can only be achieved by giving employees appropriate compensation to encourage efficiency so that optimum output can be achieved in effective manner.

A well-motivated team of employees can bring about wonders. Each concern should, therefore, constantly strive to raise the productivity of employee. The efforts for the control of employee costs should begin from the very beginning. There has to be a concerted effort by all the concerned departments.

Department	Functions
1. Personnel Department	<ul style="list-style-type: none"> i) On receipt of employee requisition from the various departments it searches for the required skills and qualification. ii) It ensures that the persons recruited possess the requisite qualification and skills required for the job. iii) Arranges proper training for the newly recruited employees and workshops for existing employees. iv) Maintains all personal and job related records of the employees. v) Evaluation of performance from time to time
2. Engineering and Work Study Department	<ul style="list-style-type: none"> i) Prepares plans and specifications for each job. ii) Providing training and guidance to the employees. iii) Supervises production activities. iv) Conducts time and motion studies. v) Undertakes job analysis. vi) Conducts job evaluation.

3. Time-keeping Department	i) Concerned with the maintenance of attendance records i.e. time keeping and ii) Time spent by an employee on various jobs i.e. time booking etc.
4. Payroll Department	i) The preparation of payroll of the employees. ii) It disburses salary and wage payments.
5. Cost Accounting Department	i) Accumulation and classification of employee costs. ii) Analysis and allocation of costs to various cost centres or cost objects

3.3.1 Important Factors for the Control of Employee Cost

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

- (i) Assessment of manpower requirements.
- (ii) Control over time-keeping and time-booking.
- (iii) Time & Motion Study.
- (iv) Control over idle time and overtime.
- (v) Control over employee turnover.
- (vi) Wage and Incentive systems.
- (vii) Job Evaluation and Merit Rating.
- (viii) Employee productivity.

3.3.2 Collection of Employee Costs

The task of collecting employee costs is performed by the Cost Accounting Department which record separately wages paid to direct and indirect employee. It is the duty of this department to ascertain the effective wages paid per hour in each department and to analyse the total payment of wages of each department into:

- (i) the amount included in the direct cost of goods produced or jobs completed;
 - (ii) the amount treated as indirect employee cost and thus included in overheads;
- and

- (iii) the amount treated as the cost of idle time and hence loss.
- (iv) the amount treated as abnormal loss/ gain and to be transferred to profit and loss account.

Through this process costs of various jobs are ascertained. Naturally, in this the proper recording of time spent by the employees is essential.



3.4 ATTENDANCE & PAYROLL PROCEDURES

3.4.1 Attendance Procedure / Time-keeping

It refers to correct recording of the employees' attendance time. Students may note the difference between "time keeping" and "time booking". The latter refers to break up of time on various jobs while the former implies a record of total time spent by the employees in a factory.

Objectives of Time-keeping: Correct recording of employees' attendance time is of utmost importance where payment is made on the basis of time worked.

Where payment is made by results viz; straight piece work, it would still be necessary to correctly record attendance for the purpose of ensuring that proper discipline and adequate rate of production are maintained. The objectives of time-keeping are as follows:

- (i) For the preparation of payrolls.
- (ii) For calculating overtime.
- (iii) For ascertaining and controlling employee cost.
- (iv) For ascertaining idle time.
- (v) For disciplinary purposes.
- (vi) For overhead distribution.

Methods of Time-keeping: There are various methods of time-keeping, which may be categorized into manual and mechanical methods. The choice of a particular method depends upon the requirements and policy of an entity; but whichever method is followed, it should make a correct record of the time by incurring minimum possible expenditure and it should minimise the risk of fraudulent payments of wages. The examples of time keeping methods are follows:

1. Manual Methods

(a) **Attendance Register method-** Under this method, an attendance register is kept to **record the arrival and departure time of an employee**. This method is simple and expensive and is suitable for small organisations. However, this method may lead to dishonest practice of time manipulation by way of recording wrong time and back date entry in collusion with time keeper.

(b) **Metal Disc/ Token method-** This method of time recording is very old and is almost obsolete in practice. Under this method, *each employee is allotted a metal disc or a token with a hole bearing his identification number. The token is kept or handed to the time keeper who record the token number in his register.* Like attendance register method, this method also has some disadvantages like error in recording, proxy attendance etc.

2. Mechanical/ Automated Methods

(a) **Punch Card Attendance-** Under this method, each employee is provided a card for marking attendance. **A punch card contains data related with the employee in digital form.** In punch card attendance system, an employee needs to either insert or wave his card to a card reader which then ensures whether the correct person is logging in and/or out. This system does not require to employ any time keeper and minimises the risk of recording error and time manipulation.

(b) **Bio- Metric Attendance system-** Under bio-metric attendance system **attendance is marked by recognizing an employee on the basis of physical and behavioural traits.** An employee's unique identity like finger print, face and retina image etc. are kept in a database which is matched at the time of marking of attendance before the attendance device for this purpose. Bio-metric attendance system includes fingerprint recognition system, face recognition system, Time and attendance tracking technology etc. This system reduces the risk of time manipulation and proxy attendance. However, it may not be suitable for small organisations due to cost associated with set-up and maintenance.

Requisites of a Good Time-keeping System: A good time-keeping system should have following requisites:

1. System of time-keeping should be such which should not allow proxy for another employee under any circumstances.
2. There should also be a provision of recording of time of piece employees so that regular attendance and discipline may be maintained. This is necessary to maintain uniformity of flow of production.

3. Time of arrival as well as time of departure of employees should be recorded so that total time of employees may be recorded and wages may be calculated accordingly.
4. As far as possible, method of recording of time should be mechanical so that chances of disputes regarding time may not arise between employees and the time-keeper.
5. Late-comers should record late arrivals. Any relaxation by the time-keeper in this regard will encourage indiscipline.
6. The system should be simple, smooth and quick. Unnecessary queuing for marking attendance should be avoided.
7. The system should be reviewed and maintained periodically to prevent any error.

3.4.2 Time-Booking

Time keeping just records the time spent by an employee in the premises for production but it does not show how much time a person spent on a particular job.

Time booking refers to a method wherein each activity of an employee is recorded. This data recorded is further used for measure the time spent on a particular job for costing, measurement of efficiency, fixation of responsibility etc.

Time booking for costing: The time spent on a particular job or activity is used to compute the cost of the job or activity.

Time booking to measure efficiency: The efficiency of the employees is measures by comparing the actual time taken by an employee with the standard time that should have been taken.

Time booking for fixation of responsibility: The time booked data is used to analyse the variance in time taken by an employee on a particular job or process with respect to standard time to see the reasons for the variance. The reasons for variance is further classified as controllable and uncontrollable. The *controllable reasons* are those which can be avoided by due care and efficiency. On the other hand, *uncontrollable reasons* cannot be avoided under the normal circumstances. Employees or any other concerned person or departments are made accountable for variance under controllable reasons.

For the collection of all such data, a separate record, generally known as Time (or Job) card, is kept.

The time (or job) card can be of two types—

- **One containing analysis of time with reference to each job:** *A separate job card is employed in respect of a job undertaken; where a job involves several operations, a separate entry is made in respect of each operation.*

Thus, the job card would record the total time spent on a particular job or operation. If a number of people are engaged on the same job or operation, the time of all those employees would be booked on the same card.

One advantage of this method is that it provides complete data on the employee content of job or operation collectively so that the computation of employee cost is greatly facilitated.

But this method has drawbacks as well. Since an employee's job timing is scattered over a number of job cards the time spent on all these jobs and idle time must be abstracted periodically for finding each employee's total time spent on different jobs and the time for which he remained idle during the period. The total of these two times (job and idle) must obviously equal his total attendance time, as shown by his attendance record.

- **The other with reference to each employee:** In this case, it would greatly facilitate reconciliation of the employee's job time with his attendance time recorded.

Under this system, a separate card would be used for each employee for each day or for each week and the time which he spends on different jobs (and also any idle time) would be recorded in the same card so that the card would have a complete history on it as to how his time had been spent during the period.

The format of job or time may vary industry to industry and according to the accounting system into used.

3.4.3 Payroll Procedure

Steps included in this process are as under:

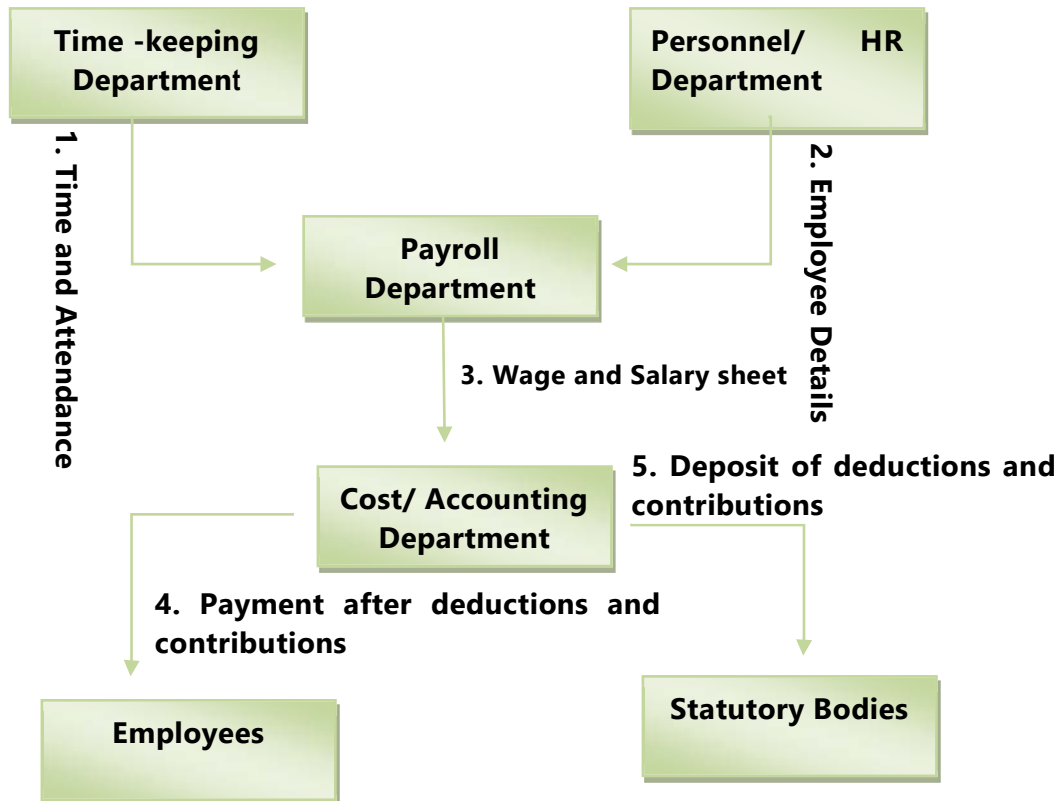


Diagram: Payroll Procedures

1. **Attendance and Time details:** A detailed sheet of number of days or hours worked by each employee (in case of time based payment) and units or percentage of work (in case of piece rate) *as reflected by the time keeping methods are sent to the payroll department by the time keeping department.* Further, payroll department with the help of time booking records calculate any further incentives such as overtime payment, bonus to be paid to the employees.
2. **List of employees and other details:** *A list of employees on roll and the rate at which they will be paid is sent by the personnel/ HR department.* Payroll department should ensure that no unauthorised or bogus employee is paid.
3. **Computation of wages and other incentives:** Payroll department based on the details provided by the time keeping department and personnel

department calculate wages/ salary to be paid to the employees. *Payroll department prepares pay slip for all employees authorized by the personnel department and forward the same to the cost/ accounting department for further deductions and payment.*

4. **Payment to the employees:** Cost/ accounting department deduct all statutory deduction such as employee's contribution to provident fund and employee state insurance (ESI) scheme, TDS on salary etc. *After all deductions wages/ salary is paid to the employees.*
5. **Deposit of all statutory liabilities:** All statutory deduction made from wages/ salary of the employees alongwith employer's contributions such as provident fund and employee state insurance scheme are paid to the respective statutory bodies.

The followings are generally deducted from the payroll

Type of deductions	Description
Statutory Deductions	
1. Provident fund	Employee's contribution to the Provident fund is deducted from the salary/ wages of the concerned employee.
2. Employee State Insurance Scheme (ESI)	Employee's contribution to the ESI is deducted from the salary/ wages.
3. Tax Deduction at Source (TDS)	Employer is obliged to deduct tax at source if it will be paying to the employee net salary exceeding maximum exemption limit, in equal monthly installments to the income tax department.
4. Professional Tax	Professional tax is a state level tax imposed for carrying on business, profession or service.
Other Deductions	
1. Voluntary contribution to Provident fund	If any employee so desires may contribute over and above the contribution payable by the employer.
2. Contribution to any benevolent fund.	An employee may contribute to any benevolent fund voluntarily by putting a request to the payroll department.

3. Loan deductions	Installments of any loan taken by the employee.
4. Other advances and dues	Other advances like festival advance and unadjusted advances taken.



3.5 IDLE TIME

The time during which no production is carried-out because the worker remains idle but are paid. In other words, it is the difference between the time paid and the time booked. *Idle time can be normal or abnormal.* The time for which employees are paid includes holidays, paid leaves, allowable rest or off time etc.

Normal idle time: It is the time which cannot be avoided or reduced in the normal course of business.

Causes	Treatment
1. The time lost between factory gate and the place of work,	It is treated as a part of cost of production. Thus, in the case of direct workers an allowance for normal idle time is considered setting of standard hours or standard rate. In case of indirect workers, normal idle time is considered for the computation of overhead rate.
2. The interval between one job and another,	
3. The setting up time for the machine,	
4. Normal rest time, break for lunch etc.	

Abnormal idle time: Apart from normal idle time, there may be factors which give rise to abnormal idle time.

Causes	Treatment
1. Idle time may also arise due to abnormal factors like lack of coordination	<i>Abnormal idle time</i> cost is not included as a part of production cost and is shown as a separate item in the Costing Profit and Loss Account. The cost of abnormal idle time should be further categorised into controllable and uncontrollable. For each category, the
2. Power failure, Breakdown of machines	

<p>3. Non-availability of raw materials, strikes, lockouts, poor supervision, fire, flood etc.</p> <p>4. The causes for abnormal idle time should be further analysed into controllable and uncontrollable.</p> <p>i) <i>Controllable abnormal idle time</i> refers to that time which could have been put to productive use had the management been more alert and efficient. All such time which could have been avoided is controllable idle time.</p> <p>ii) <i>Uncontrollable abnormal idle time</i> refers to time lost due to abnormal causes, over which management does not have any control e.g., breakdown of machines, flood etc. may be characterised as uncontrollable idle time.</p>	<p>break-up of cost due to various factors should be separately shown. This would help the management in fixing responsibility for controlling idle time. Management should aim at eliminating controllable idle time and on a long-term basis reducing even the normal idle time. This would require a detailed analysis of the causes leading to such idle time.</p>
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ILLUSTRATION 1

'X' an employee of ABC Co. gets the following emoluments and benefits:

(a) Basic pay	₹ 10,000 p.m.
(b) Dearness allowance	₹ 2,000 p.m.
(c) Bonus	20% of salary and D.A.
(d) Other allowances	₹ 2,500 p.m.
(e) Employer's contribution to P.F.	10% of salary and D.A.

'X' works for 2,400 hours per annum, out of which 400 hours are non-productive and treated as normal idle time. You are required to COMPUTE the effective hourly cost of employee 'X'.

SOLUTION**Statement showing computation of effective hourly cost of employee 'X'**

	Per month (₹)	Per annum (₹)
(A) Earning of Employee 'X':		
Basic pay	10,000	1,20,000
Dearness Allowance	2,000	24,000
Bonus	2,400	28,800
Employer's contribution to provident fund	1,200	14,400
Other allowances	2,500	30,000
	18,100	2,17,200
(B) Effective working hours (refer workings)		2,000 hours
(C) Effective hourly cost {(A) ÷ (B)}		₹108.60

Workings:

Calculation of effective working hours:

Annual working hours less Normal idle time = 2,400 hours – 400 hours = 2,000 hours.

ILLUSTRATION 2

In a factory working six days in a week and eight hours each day, a worker is paid at the rate of ₹ 100 per day basic plus D.A. @ 120% of basic. He is allowed to take 30 minutes off during his hours shift for meals-break and a 10 minutes recess for rest. During a week, his card showed that his time was chargeable to :

Job X	15 hrs.
Job Y	12 hrs.
Job Z	13 hrs.

The time not booked was wasted while waiting for a job. In Cost Accounting, STATE how would you allocate the wages of the workers for the week?

SOLUTION**Working notes:**

(i) Total effective hours in a week:

$$[(8 \text{ hrs.} - (30 \text{ mts.} + 10 \text{ mts.})) \times 6 \text{ days}] = 44 \text{ hours}$$

(ii) Total wages for a week:

$$(\text{₹ } 100 + 120\% \text{ of ₹ } 100) \times 6 \text{ days} = \text{₹ } 1,320$$

(iii) Wage rate per hour = $1320 \div 44 \text{ hours} = \text{₹ } 30$

(iv) Time wasted waiting for job (Abnormal idle time):

$$= 44 \text{ hrs.} - (15 \text{ hrs.} + 12 \text{ hrs.} + 13 \text{ hrs.}) = 4 \text{ hrs.}$$

Allocation of wages in Cost Accounting

	(₹)
Allocated to Job X : 15 hours × ₹ 30	450
Allocated to Job Y : 12 hours × ₹ 30	360
Allocated to Job Z : 13 hours × ₹ 30	390
Charged to Costing Profit & Loss A/c : 4 hours × ₹ 30	<u>120</u>
Total	<u>1,320</u>

3.6 OVERTIME

Work done beyond normal working hours is known as 'overtime work'. Overtime payment is the amount of wages paid for working beyond normal working hours. *Overtime payment consist of two elements-* (i) Normal wages for overtime work and (ii) Premium payment for overtime work.

$$\text{Overtime Payment} = \text{Wages paid for overtime at normal rate} + \text{Premium (extra) payment for overtime work}$$

Overtime premium: The rate for overtime work is higher than the normal time rate; usually it is at double the normal rates. *The extra amount so paid over the normal rate is called overtime premium.*

Rate and conditions for overtime premium may either be fixed by an entity itself or it may be required by any statute in force. The overtime premium should not be less than the premium calculated as per the statute.

As per the Factories Act 1948 "Where a worker works in a factory for more than nine hours in any day or for more than forty eight hours in any week, he shall, in respect of overtime work, be entitled to wages at the rate of twice his ordinary rate of wages."

Where any workers in a factory are paid on a piece-rate basis, the time rate shall be deemed to be equivalent to the daily average of their full-time earnings for the days on which they actually worked on the same or identical job during the month immediately preceding the calendar month during which the overtime work was done, and such time rates shall be deemed to be the ordinary rates of wages of those workers

Ordinary rate of wages means the basic wages plus such allowances, including the cash equivalent of the advantage accruing through the concessional sale to workers of food grains and other articles, as the worker is for the time being entitled to, but does not include a bonus and wages for overtime work.

Occasional overtime is a healthy sign as it indicates that the firm has the optimum capacity and that the capacity is being fully utilised. But persistent overtime is rather a bad sign because it may indicate either (a) that the firm needs larger capacity in men and machines, or (b) that men have got into the habit of postponing their ordinary work towards the evening so that they can earn extra money in the form of overtime wages.

Causes of Overtime and Treatment of Overtime premium in cost accounting

<i>Causes</i>	<i>Treatment</i>
(1) The customer may agree to bear the entire charge of overtime because urgency of work.	(1) If overtime is resorted to at the desire of the customer, then overtime premium may be charged to the job directly.
(2) Overtime may be called for to make up any shortfall in production due to some unexpected development.	(2) If overtime is required to cope with general production programmes or for meeting urgent orders, the overtime premium should be treated as overhead cost of the particular department or cost centre which works overtime.
(3) Overtime work may be necessary to make up a shortfall in production due to some fault of management.	(3) If overtime is worked in a department due to the fault of another department, the overtime premium should be charged to the latter department.

(4) Overtime work may be resorted to, to secure an out-turn in excess of the normal output to take advantage of an expanding market or of rising demand	(4) Overtime worked on account of abnormal conditions such as flood, earthquake etc., should not be charged to cost, but to Costing Profit and Loss Account.
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ILLUSTRATION 3

CALCULATE the earnings of A and B from the following particulars for a month and allocate the employee cost to each job X, Y and Z:

	A	B
(i) Basic Wages (₹)	10,000	16,000
(ii) Dearness Allowance	50%	50%
(iii) Contribution to provident Fund (on basic wages)	8%	8%
(iv) Contribution to Employee's State Insurance (on basic wages)	2%	2%
(v) Overtime (Hours)	10	--

The normal working hours for the month are 200. Overtime is paid at double the total of normal wages and dearness allowance. Employer's contribution to state Insurance and Provident Fund are at equal rates with employees' contributions. The two workers were employed on jobs X, Y and Z in the following proportions:

Jobs	X	Y	Z
Worker A	40%	30%	30%
Worker B	50%	20%	30%

Overtime was done on job Y.

SOLUTION**Statement showing Earnings of Workers A and B**

	A (₹)	B (₹)
Basic wages	10,000	16,000
Dearness Allowance (50% of Basic Wages)	5,000	8,000
Overtime wages (Refer to Working Note 1)	1,500	--
Gross wages earned	16,500	24,000
Less: Contribution to Provident fund	(800)	(1,280)

Less: Contribution to ESI	(200)	(320)
Net wages earned	15,500	22,400

Statement of Employee Cost

	A (₹)	B (₹)
Gross Wages (excluding overtime)	15,000	24,000
Add: Employer's contribution to PF	800	1,280
Add: Employer's contribution to ESI	200	320
Gross wages earned	16,000	25,600
Normal working hours	200	200
Ordinary wages rate per hour	80	128

Statement Showing Allocation of Wages to Jobs

	Total Wages (₹)	Jobs		
		X (₹)	Y (₹)	Z (₹)
Worker A:				
- Ordinary Wages (4: 3 : 3)	16,000	6,400	4,800	4,800
- Overtime	1,500	--	1,500	--
Worker B:				
- Ordinary Wages (5 : 2 : 3)	25,600	12,800	5,120	7,680
	43,100	19,200	11,420	12,480

Working Notes

1. Normal Wages are considered as basic wages

$$\begin{aligned}
 \text{Over time} &= \frac{2 \times (\text{Basic wage} + \text{DA}) \times 10 \text{ hours}}{200} \\
 &= 2 \times \left(\frac{\text{₹}15,000}{200} \right) \times 10 \text{ hours} = \text{₹}150 \times 10 \text{ hours} = \text{₹}1,500
 \end{aligned}$$

ILLUSTRATION 4

It is seen from the job card for repair of the customer's equipment that a total of 154 labour hours have been put in as detailed below:

	Worker 'A' paid at ₹ 200 per day of 8 hours	Worker 'B' paid at ₹ 100 per day of 8 hours	Worker 'C' paid at ₹ 300 per day of 8 hours
Monday (hours)	10.5	8.0	10.5
Tuesday (hours)	8.0	8.0	8.0
Wednesday (hours)	10.5	8.0	10.5
Thursday (hours)	9.5	8.0	9.5
Friday (hours)	10.5	8.0	10.5
Saturday (hours)	--	8.0	8.0
Total (hours)	49.0	48.0	57.0

In terms of an award in employee conciliation, the workers are to be paid dearness allowance on the basis of cost of living index figures relating to each month which works out @ ₹968 for the relevant month. The dearness allowance is payable to all workers irrespective of wages rate if they are present or are on leave with wages on all working days.

Sunday is a weekly holiday and each worker has to work for 8 hours on all week days and 4 hours on Saturdays; the workers are however paid full wages for Saturday (8 hours for 4 hours worked).

Overtime is paid twice of ordinary wage rate if a worker works for more than nine hours in a day or forty eight hours in a week. Excluding holidays, the total number of hours works out to 176 in the relevant month. The company's contribution to Provident Fund and Employees State Insurance Premium are absorbed into overheads.

CALCULATE the wages payable to each worker.

SOLUTION

(1) Calculation of hours to be paid for worker A:

	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
Monday	8	1	1½	3	12
Tuesday	8	--	--	--	8
Wednesday	8	1	1½	3	12
Thursday	8	1	½	1	10

Friday	8	1	1½	3	12
Saturday	--	--	--	--	--
Total	40	4	5	10	54

Calculation of hours to be paid for worker B:

	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
Monday	8	---	---	---	8
Tuesday	8	---	---	---	8
Wednesday	8	---	---	---	8
Thursday	8	---	---	---	8
Friday	8	---	---	---	8
Saturday	4	4*	---	---	8
Total	44	4	---	---	48

(*Worker-B has neither worked more than 9 hours in any day nor more than 48 hours in the week)

Calculation of hours to be paid for worker C:

	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
Monday	8	1	1½	3	12
Tuesday	8	---	---	---	8
Wednesday	8	1	1½	3	12
Thursday	8	1	½	1	10
Friday	8	1	1½	3	12
Saturday	4	---	4*	8	12
Total	44	4	9	18	66

(*Worker-C has worked more than 48 hours in the week)

Wages payable:

	A	B	C
Basic Wages per hour (₹)	25.00	12.50	37.50
Dearness allowance per hour (₹)	5.50	5.50	5.50
Hourly rate (₹)	30.50	18.00	43.00
Total normal hours	54.00	48.00	66.00
Total Wages payable (₹)	1,647.00	864.00	2,838.00

ILLUSTRATION 5

In a factory, the basic wage rate is ₹100 per hour and overtime rates are as follows:

<i>Before and after normal working hours</i>	<i>175% of basic wage rate</i>
<i>Sundays and holidays</i>	<i>225% of basic wage rate</i>
<i>During the previous year, the following hours were worked</i>	
- Normal time	1,00,000 hours
- Overtime before and after working hours	20,000 hours
Overtime on Sundays and holidays	5,000 hours
Total	1,25,000 hours

The following hours have been worked on job 'Z'

<i>Normal</i>	1,000 hours
<i>Overtime before and after working hrs.</i>	100 hours.
<i>Sundays and holidays</i>	25 hours.
Total	1,125 hours

You are required to CALCULATE the labour cost chargeable to job 'Z' and overhead in each of the following instances:

- Where overtime is worked regularly throughout the year as a policy due to the workers' shortage.*
- Where overtime is worked irregularly to meet the requirements of production.*
- Where overtime is worked at the request of the customer to expedite the job.*

SOLUTION**Workings**

Basic wage rate : ₹ 100 per hour

Overtime wage rate before and after working hours: ₹ 100 × 175% = ₹ 175 per hour

Overtime wage rate for Sundays and holidays : ₹ 100 × 225% = ₹ 225 per hour

Computation of average inflated wage rate (including overtime premium):

Particulars	Amount (₹)
Annual wages for the previous year for normal time (1,00,000 hrs. × ₹100)	1,00,00,000
Wages for overtime before and after working hours (20,000 hrs. × ₹175)	35,00,000
Wages for overtime on Sundays and holidays (5,000 hrs. × ₹225)	11,25,000
Total wages for 1,25,000 hrs.	1,46,25,000

$$\text{Average inflated wage rate} = \frac{\text{₹ 1,46,25,000}}{1,25,000 \text{ hours}} = ₹117$$

(a) Where overtime is worked regularly as a policy due to workers' shortage:

The overtime premium is treated as a part of employee cost and job is charged at an inflated wage rate. Hence, employee cost chargeable to job Z

$$= \text{Total hours} \times \text{Inflated wage rate} = 1,125 \text{ hrs.} \times ₹ 117 = ₹1,31,625$$

(b) Where overtime is worked irregularly to meet the requirements of production:

Basic wage rate is charged to the job and overtime premium is charged to factory overheads as under:

$$\text{Employee cost chargeable to Job Z: } 1,125 \text{ hours @ ₹100 per hour} = ₹ 1,12,500$$

$$\text{Factory overhead: } \{100 \text{ hrs.} \times ₹ (175 - 100)\} + \{25 \text{ hrs.} \times ₹ (225 - 100)\} = \{₹7,500 + ₹3,125\} = ₹10,625$$

(c) **Where overtime is worked at the request of the customer, overtime premium is also charged to the job as under:**

			(₹)
Job Z Employee cost	1,125 hrs. @ ₹ 100	=	1,12,500
Overtime premium	100 hrs. @ ₹ (175 – 100)	=	7,500
	25 hrs. @ ₹ (225 – 100)	=	<u>3,125</u>
Total			<u>1,23,125</u>

3.7 LABOUR UTILISATION

For identifying utilisation of labour a statement is prepared (generally weekly) for each department / cost centre. This statement should show the actual time paid for, the standard time (including normal idle time) allowed for production and the abnormal idle time analysed for causes thereof.

3.7.1 Identification of Utilisation of labours with Cost Centres:

For the identification of utilisation of labour with the cost centre, a **wage analysis sheet** is prepared. *Wage analysis sheet is a statement in which total wages paid are analysed according to cost centre, jobs, work orders etc.* The data for analysis is provided by wage sheet, time card, piece work cards and job cards.

The preparation of such sheet serves the following purposes:

- It analyse the labour time into direct and indirect labour by cost centres, jobs, work orders.
- It provides details of direct labour cost comprises of wages, overtime to be charged as production cost of cost centre, jobs or work orders.
- It provides information for treatment of indirect labour cost as overhead expenses.

3.7.2 Identification of labour hours with work order or batches or capital job:

For identification of labour hours with work order or batches or capital jobs or overhead work orders the following points are to be noted:

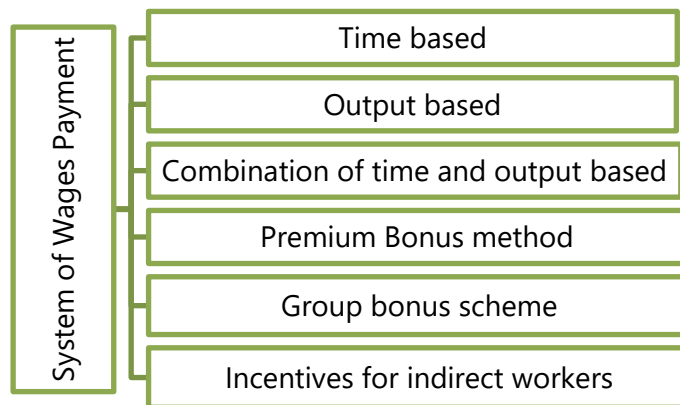
- The direct labour hours can be identified with the particular work order or batches or capital job or overhead work orders on the basis of details recorded on source document such as time sheet or job cards.

- (ii) The indirect labour hours cannot be directly identified with the particular work order or batches or capital jobs or overhead work orders. Therefore, they are traced to cost centre and then assigned to work order or batches or capital jobs or overhead work orders by using overhead absorption rate.



3.8 SYSTEMS OF WAGE PAYMENT AND INCENTIVES

There exist several systems of employee wage payment and incentives, which can be classified under the following heads:



3.8.1 Time based (Time Rate System)

Straight Time Rate System: Under this system, the workers are paid on time basis i.e. hour, day, week, or month. The amount of *wages due to a worker are arrived at by multiplying the time worked (including normal idle period) by rate for the time.*

Time based wages payment is suitable for the employees (i) whose services cannot be directly or tangibly measured, e.g., general helpers, supervisory and clerical staff etc. (ii) engaged in highly skilled jobs, (iii) where the pace of output is independent of the operator, e.g., automatic chemical plants.

Wages under time rate system is calculated as under:

$$\text{Wages} = \text{Time Worked (Hours/ Days/ Months)} \times \text{Rate for the time}$$

3.8.2 Output Based (Piece Rate System)

Straight Piece Rate System: Under this system, each operation, job or unit of production is termed a piece. A rate of payment, known as the piece rate or piece

work rate is fixed for each piece. The wages of the worker depend upon his output and rate of each unit of output; it is in fact independent of the time taken by him. The wages paid to a worker are calculated as:

$$\text{Wages} = \text{Number of units produced} \times \text{Rate per unit}$$

3.8.3 Premium Bonus Method

Under these methods, standard time is established for performing a job. The worker is guaranteed his daily wages (except in Barth System), if his output is below and upto standard. In case the task is completed in less than the standard time, the saved time is shared between the employee and the employer.

(i) Halsey Premium Plan: Under Halsey premium plan a standard time is fixed for each job or process. If there is no saving on this standard time allowance, the worker is paid only his day rate. He gets his time rate even if he exceeds the standard time limit, since his day rate is guaranteed.

If, however, he does the job in less than the standard time, he gets a bonus equal to 50 percent of the wages of time saved; the employer benefits by the other 50 percent. The scheme also is sometimes referred to as the Halsey fifty percent plan. Earnings under Halsey Premium plan is calculated as under:

$$\text{Wages} = \text{Time taken} \times \text{Time rate} + 50\% \text{ of time saved} \times \text{Time rate}$$

Advantages and Disadvantages of Halsey Premium Plan

Advantages	Disadvantages
<ol style="list-style-type: none"> 1. Time rate is guaranteed while there is opportunity for increasing earnings by increasing production. 2. The system is equitable in as much as the employer gets a direct return for his efforts in improving production methods and providing better equipment. 	<ol style="list-style-type: none"> 1. Incentive is not so strong as with piece rate system. In fact the harder the worker works, the lesser he gets per piece. 2. The sharing principle may not be liked by employees.

ILLUSTRATION 6

CALCULATE the earnings of a worker under Halsey System. The relevant data is as below:

Time Rate (per hour)	₹ 60
Time allowed	8 hours

*Time taken**6 hours**Time saved**2 hours***SOLUTION****Calculation of total earnings:**

= Time taken × Time rate + 50% (Time Allowed – Time Taken) × Time rate

= 6 hrs. × ₹60 + 1/2 × (2 hrs. × ₹60) or ₹360 + ₹60 = ₹420

Of his total earnings, ₹360 is on account of the time worked and ₹60 is on account of his share of the premium bonus.

(ii) Rowan Premium Plan: According to this system a standard time allowance is fixed for the performance of a job and bonus is paid if time is saved.

Under Rowan System the bonus is that proportion of the time wages as time saved bears to the standard time.

$$\text{Time taken} \times \text{Rate per hour} + \frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time taken} \times \text{Rate per hour}$$

Advantages and Disadvantages of Rowan Premium Plan

Advantages	Disadvantages
1. It is claimed to be a fool-proof system in as much as a worker can never double his earnings even if there is bad rate setting.	1. The system is a bit complicated.
2. It is admirably suitable for encouraging moderately efficient workers as it provides a better return for moderate efficiency than under the Halsey Plan.	2. The incentive is weak at a high production level where the time saved is more than 50% of the time allowed.
3. The sharing principle appeals to the employer as being equitable.	3. The sharing principle is not generally welcomed by employees.

ILLUSTRATION 7

CALCULATE the earnings of a worker under Rowan System. The relevant data is given as below:

*Time rate (per Hour)**₹ 60**Time allowed**8 hours.*

Time taken	6 hours.
Time saved	2 hours.

SOLUTION**Calculation of total earnings:**

$$\begin{aligned}
 &= \text{Time taken} \times \text{Rate per hour} + \frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time taken} \times \text{Rate per hour} \\
 &= 6 \text{ hours} \times ₹60 + \frac{2 \text{ hours}}{8 \text{ hours}} \times 6 \text{ hours} \times ₹60 = ₹360 + ₹90 = ₹450
 \end{aligned}$$

ILLUSTRATION 8

Two workmen, '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 the Rowan system, while 'B' is paid bonus according to the Halsey system. 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 man-hour actually worked. The factory cost for the product for 'A' is ₹3,490 and for 'B' it is ₹3,600.

Required:

- COMPUTE the normal rate of wages;
- COMPUTE the cost of materials cost;
- PREPARE a statement comparing the factory cost of the products as made by the two workmen.

SOLUTION

Step 1 : Let X be the cost of material and Y be the normal rate of wages per hour.

Step 2 : Factory Cost of Workman 'A'

	(₹)
A. Material Cost	X
B. Wages (Rowan Plan)	30 Y
C. Bonus = $\frac{30}{50} \times (50 - 30) \times Y$	12 Y
D. Overheads (30 × ₹5)	150
E. Factory Cost	3,490
Or, X + 42 Y = ₹3,490 (Given) – ₹150 = ₹3,340.....equation (i)	

Step 3 : Factory Cost of Workman 'B'

	(₹)
A. Material Cost	X
B. Wages (Halsey Plan)	40 Y
C. Bonus = 50% of (SH - AH) × R	5 Y
= 50% of (50 - 40) × R	
D. Overheads (40 × ₹5)	200
E. Factory Cost	3,600
Or, $X + 45 Y = ₹3,600$ (Given) – ₹200 = ₹3,400.....equation (ii)	

Step 4 : Subtracting equation (i) from equation (ii)

$$3Y = ₹60$$

$$Y = ₹60/3 = ₹20 \text{ per hour.}$$

- (a) The normal rate of wages: ₹20 per hour
- (b) The cost of material: $X + 45 \times ₹20 = ₹3,400$ or, $X = ₹3,400 - ₹900 = ₹2,500$
- (c) **Comparative Statement of the Factory Cost of the product made by the two workmen.**

	'A' (₹)	'B' (₹)
Material cost	2,500	2,500
Direct Wages	600 (30 × ₹20)	800 (40 × ₹20)
Bonus	240 (12 × ₹20)	100 (5 × ₹20)
Factory Overhead	150	200
Factory Cost	3,490	3,600

ILLUSTRATION 9

- (a) Bonus paid under the Halsey Plan with bonus at 50% for the time saved equals the bonus paid under the Rowan System. When will this statement hold good? (Your answer should contain the proof).
- (b) The time allowed for a job is 8 hours. The hourly rate is ₹8. PREPARE a statement showing:
- i. The bonus earned

ii. The total earnings of employee and

iii. Hourly earnings.

Under the Halsey System with 50% bonus for time saved and Rowan System for each hour saved progressively.

SOLUTION

$$(a) \quad \text{Bonus under Halsey Plan} = \frac{50}{100} \times (SH - AH) \times R \quad (i)$$

$$\text{Bonus under Rowan Plan :} = \frac{AH}{SH} \times (SH - AH) \times R \quad (ii)$$

Bonus under Halsey Plan will be equal to the bonus under Rowan Plan when the following condition holds good:

$$\frac{50}{100} \times (SH - AH) \times R = \frac{AH}{SH} \times (SH - AH) \times R$$

$$\frac{50}{100} = \frac{AH}{SH}$$

Hence, when the actual time taken (AH) is 50% of the time allowed (SH), the bonus under Halsey and Rowan Plans is equal.

(b) Statement of Bonus, total earnings of Employee and hourly earnings under Halsey and Rowan Systems.

SH	AH	Time saved	Basic wages (AH x ₹8) (B x ₹8)	Bonus under Halsey System $\left[\frac{50}{100} \times C \times 8 \right]$	Bonus under Rowan system $\left[\frac{B}{A} \times C \times 8 \right]$	Total Earnings under Halsey System D+E	Total Earnings under Rowan System D+F	Hourly Earnings under Halsey System G/B	Hourly Earnings under Rowan System H/B
A Hours	B hours	C = (A-B) hours	D ₹	E ₹	F ₹	G ₹	H ₹	I ₹	J ₹
8	8	-	64	-	-	64	64	8.00	8.00
8	7	1	56	4	7	60	63	8.57	9.00
8	6	2	48	8	12	56	60	9.33	10.00
8	5	3	40	12	15	52	55	10.40	11.00

8	4	4	32	16	16	48	48	12.00	12.00
8	3	5	24	20	15	44	39	14.67	13.00
8	2	6	16	24	12	40	28	20.00	14.00
8	1	7	8	28	7	36	15	36.00	15.00

ILLUSTRATION 10

A skilled worker in XYZ Ltd. is paid a guaranteed wage rate of ₹30 per hour. The standard time per unit for a particular product is 4 hours. Mr. P, a machine man, has been paid wages under the Rowan Incentive Plan and he had earned an effective hourly rate of ₹37.50 on the manufacture of that particular product.

STATE what could have been his total earnings and effective hourly rate, had he been put on Halsey Incentive Scheme (50%)?

SOLUTION

$$\begin{aligned}
 \text{Total earnings (under 50\% Halsey Scheme)} &= \text{Hours worked} \times \text{Rate per hour} + \frac{1}{2} \\
 &\quad \times \text{time saved} \times \text{Rate per hour} \\
 &= 3 \text{ hours} \times ₹30 + \frac{1}{2} \times 1 \text{ hour} \times ₹30 = ₹105 \\
 \text{Effective hourly rate} &= \frac{\text{Total earnings}}{\text{Hours taken}} = \frac{₹105}{3 \text{ hours}} = ₹35
 \end{aligned}$$

Working Note:

Let T hours be the total time worked in hours by the skilled workers (machine man P), ₹30 is the rate per hour; standard time is 4 hours per unit and effective hourly earnings rate is ₹37.50 then

$$\begin{aligned}
 \text{Earning (under Rowan plan)} &= \text{Hours worked} \times \text{Rate per hr} + \frac{\text{Time saved}}{\text{Time allowed}} \times \\
 &\quad \text{Time taken} \times \text{Rate per hr} \\
 ₹37.5 T &= T \times ₹30 + \frac{(4 - T)}{4} \times T \times ₹30
 \end{aligned}$$

(both sides are divided by T)

$$₹37.5 = ₹30 + (4 - T) \times ₹7.5$$

$$₹37.5 = ₹30 + ₹30 - 7.5T$$

$$\text{or, } ₹7.5 T = ₹60 - ₹37.5$$

$$\text{or, } ₹7.5 T = ₹22.5$$

$$\text{or, } T = 3 \text{ hours.}$$

ILLUSTRATION 11

A factory having the latest sophisticated machines wants to introduce an incentive scheme for its workers, keeping in view the following:

- (i) The entire gains of improved production should not go to the workers.
- (ii) In the name of speed, quality should not suffer.
- (iii) The rate setting department being newly established are liable to commit mistakes.

You are required to PREPARE a suitable incentive scheme and DEMONSTRATE by an illustrative numerical example how your scheme answers to all the requirements of the management.

SOLUTION

Rowan Scheme of premium bonus (variable sharing plan) is a suitable incentive scheme for the workers of the factory. If this scheme is adopted, the entire gains due to time saved by a worker will not pass to him.

Another feature of this scheme is that a worker cannot increase his earnings or bonus by merely increasing its work speed. The reason for this is that the bonus under Rowan Scheme is maximum when the time taken by a worker on a job is half of the time allowed. As this fact is known to the workers, therefore, they work at such a speed which helps them to maintain the quality of output too.

Lastly, Rowan System provides a safeguard in the case of any loose fixation of the standards by the rate-setting department. It may be observed from the following illustration that in the Rowan Scheme the bonus paid will be low due to any loose fixation of standards. Workers cannot take undue advantage of such a situation. The above three features of Rowan Plan can be discussed with the help of the following illustration:

(i) Time allowed	=	4 hours
Time taken	=	3 hours
Time saved	=	1 hour
Rate	=	₹5 per hour
Bonus	=	$\frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{Rate}$
	=	$\frac{3 \text{ hours}}{4 \text{ hours}} \times 1 \text{ hour} \times ₹5 = ₹3.75$

In the above illustration time saved is 1 hour and, therefore, total gain is ₹ 5. Out of ₹5 according to Rowan Plan only ₹3.75 is given to the worker in the form of

bonus and the remaining ₹ 1.25 remains with the management. In other words, a worker is entitled for 75 percent of the time saved in the form of bonus.

- (ii) The figures of bonus in the above illustration when the time taken is 2 hours and 1 hour respectively are as below:

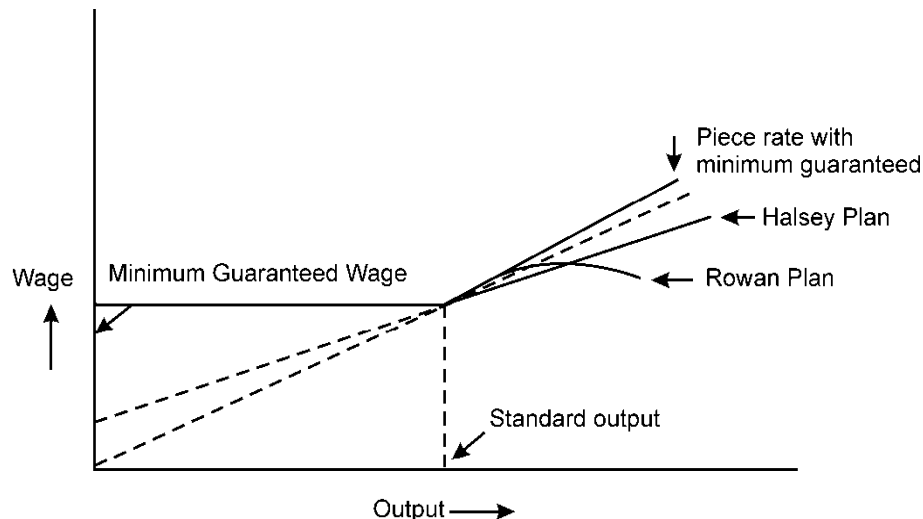
$$\begin{aligned}
 \text{Bonus} &= \frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{Rate} \\
 &= \frac{2 \text{ hours}}{4 \text{ hours}} \times 2 \text{ hours} \times ₹5 = ₹5 \\
 &= \frac{1 \text{ hour}}{4 \text{ hours}} \times 3 \text{ hours} \times ₹5 = ₹3.75
 \end{aligned}$$

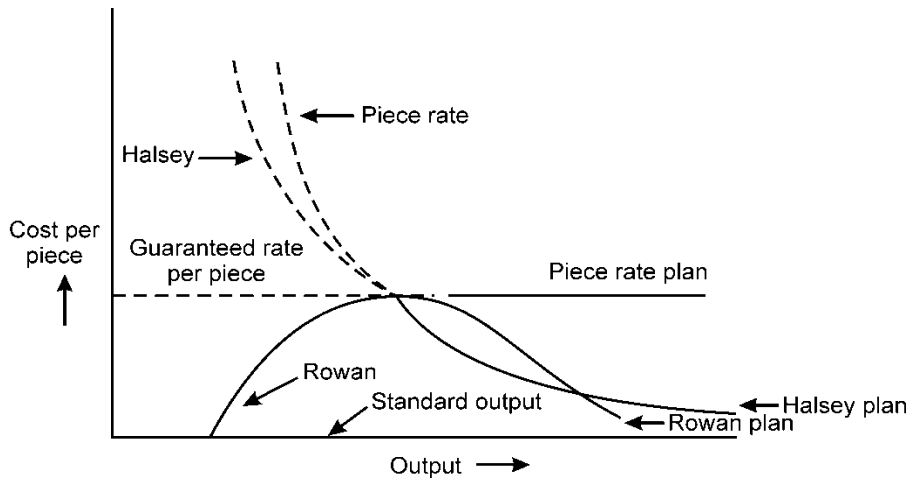
The above figures of bonus clearly show that when time taken is half of the time allowed, the bonus is maximum. When the time taken is reduced from 2 to 1 hour, the bonus figure fell by ₹1.25. Hence, it is quite apparent to workers that it is of no use to increase speed of work. This feature of Rowan Plan thus protects the quality of output.

- (iii) If the rate-setting department erroneously sets the time allowed as 10 hours instead of 4 hours, in the above illustration; then the bonus paid will be as follows:

$$\text{Bonus} = \frac{3 \text{ hours}}{10 \text{ hours}} \times 7 \text{ hours} \times ₹5 = ₹10.50$$

The bonus paid for saving 7 hours thus is ₹10.50 which is approximately equal to the wages of 2 hours. In other words, the bonus paid to the workers is low. Hence workers cannot take undue advantage of any mistake committed by the time setting department of the concern.





3.9 ABSORPTION OF WAGES

3.9.1 Elements of wages

In common parlance, the term 'wages' represents monetary payment which an employee receives at regular intervals for the services rendered. Strictly speaking, however, from the point of view of the employer and the cost to the industry, wages should be taken to include *also non-monetary benefits* which an employee receives by virtue of employment. *Such non-monetary benefits may include:*

- (i) Medical facilities;
- (ii) Educational and training facilities;
- (iii) Recreational and sports facilities;
- (iv) Housing and social welfare; and
- (v) Cost of subsidised canteen and co-operative societies.

Such benefits are generally given in an industrial establishment. In some cases, the provision of benefits is compulsory. Therefore, while computing the wage cost per worker, the monetary value of such non-monetary benefits should also be taken into account.

The monetary part of a worker's remuneration includes the basic wages, dearness allowance, overtime wages, other special allowance, if any, production bonus, employer's contribution to the provident fund, Employees State Insurance scheme premium, contribution to pension fund, leave pay, etc.

The basic wage is the payment for work done, measured in terms of hours attended or the units produced, as the case may be. The basic wage rate is not normally altered unless there is a fundamental change in the working conditions or methods of manufacture.

Dearness allowance is an allowance provided to cover the increase in cost of living from one period to another. This allowance is calculated either as percentage of the basic wage or as a fixed amount for the days worked. In either case, the percentage or the fixed amount is subject to revision whenever the cost of living index or consumer price Index rises or falls by a certain figure as agreed to by the employer with the Employee union. When permanent rise in the cost of living index occurs, a part of the dearness allowance is often absorbed in the basic wage.

Overtime allowance is an allowance paid for the extra hours worked at the rates laid down in the Factories Act. In certain industries, where special allowance for the working conditions, tool maintenance, etc., are paid they are also considered as part of wages.

Production Bonus is an incentive payment made to workers for efficiency that results in production above the standard. There are different methods of computing incentives. Under the Payment of Bonus Act, a worker is entitled to compulsory bonus of 8.33% wages earned in the relevant year or ₹100 (whichever is greater). The bonus may be upto 20% of wages depending upon the quantum of profits calculated as per the Act.

3.9.2.Component of wages cost or wages for costing purposes

In addition to wages (including allowances, such as D.A.) that are paid to workers, a firm may have to spend on many other items (such as premium to the ESI or provident fund or bonus).

Further, the worker does not spend all the time for which he is paid on productive work.

This is because he is entitled to weekly holiday and various type of leave. There is also a certain amount of unavoidable idle time. The question is to what extent such additional payment or cost in respect of Employee can be charged directly to unit of cost as part of direct Employee cost? Of course, in the case of indirect Employee, all such payments as also the wages paid to them, must be treated as part of overheads.

But in the case of direct workers, two alternatives are possible. The additional charges may be treated as overheads. Alternatively, the wage rates being charged

to job may be computed by including such payments; automatically then, such payments will be charged to the work done along with wages of the worker. (It should be remembered that such wage rate will be only for costing purposes and not for payment to workers). The total of wages and additional payment should be divided by effective hours of work to get such wage rates for costing purposes.

ILLUSTRATION 12

A worker is paid ₹10,000 per month and a dearness allowance of ₹2,000 p.m. Worker contribution to provident fund is @ 10% and employer also contributes the same amount as the employee. The Employees State Insurance Corporation premium is 6.5% of wages of which 1.75% is paid by the employees. It is the firm's practice to pay 2 months' wages as bonus each year.

The number of working days in a year are 300 of 8 hours each. Out of these the worker is entitled to 15 days leave on full pay. CALCULATE the wage rate per hour for costing purposes.

SOLUTION

	(₹)
Wages paid to worker during the year $\{(\text{₹ } 10,000 + 2,000) \times 12\}$	1,44,000
Add: Employer Contribution to:	
Provident Fund @ 10%	14,400
E.S.I. Premium @ 4.75% (6.5 – 1.75)	6,840
Bonus at 2 months' wages (Basic + DA)	24,000
Total	1,89,240

Effective hours per year: 285 days \times 8 hours = 2,280 hours

Wage-rate per hour (for costing purpose): ₹1,89,240/2,280 hours = **₹83**

3.9.3 Holiday and leave wages

One alternative to account for wages paid on account of paid holiday and leave can be to include them as *departmental overheads*. In such a case, it is necessary to record such wages separately from "worked for wages". Such a segregation can be made possible by providing a separate column in the payroll for holiday and leave wages in the same way as there are columns for dearness allowance, provident fund deductions, etc. If, however, a separate or additional column cannot be provided for this purpose it would be necessary to analyse the payroll periodically to

ascertain how much of the total payment pertains to “worked for wages” and how much is attributed to leave and holiday wages.

Another way could be to inflate the wage rate for costing purposes to include holiday and leave wages. This can be done only in the case of direct workers.

ILLUSTRATION 13

CALCULATE the Employee hour rate of a worker X from the following data:

Basic pay	₹ 10,000 p.m.
D.A.	₹ 3,000 p.m.
Fringe benefits	₹ 1,000 p.m.

Number of working days in a year 300. 20 days are availed off as holidays on full pay in a year. Assume a day of 8 hours.

SOLUTION

(i)	Effective working days in a year	300
	Less: Leave days on full pay	<u>20</u>
	Effective working days	280 days
	Total effective working hours (280 days × 8 hours)	2,240
(ii)	Total wages paid in a year	(₹)
	Basic pay	1,20,000
	D.A.	36,000
	Fringe benefits	<u>12,000</u>
		<u>1,68,000</u>
(iii)	Hourly rate : ₹1,68,000/2,240 hours	<u>₹75.00</u>

3.9.4 Night shift allowance

In some cases, workers get extra payment if they work at night. Since the extra payment is not for any particular job, therefore such a payment should be treated as part of overheads.

3.9.5 Absorption rates of Employee cost:

Employee cost as stated above include monetary compensation and non-monetary benefits to workers.

Monetary benefits include, basic wages, D.A., overtime pay, incentive or production bonus contribution to employee provident fund, House Rent Allowance, Holiday and vacation pay etc.

The non-monetary benefits include medical facilities, subsidized canteen services, subsidized housing, education and training facilities.

Accounting of monetary and non-monetary benefits to indirect workers does not pose any problems because the total of monetary and non-monetary benefits are treated as overhead and absorbed on the basis of rate per direct employee hour, if overheads are predominantly employee oriented.

For direct workers, the ideal method is to charge jobs or units produced by supplying per hour rate calculated as below:

$$\text{Rate per hour} = \frac{\text{Total estimated monetary benefits and cost of non-monetary benefits}}{\text{Budgeted direct employee hour - Normal idle time}}$$

Another alternative method is to treat the monetary benefits other than basic wages and dearness allowance as well as cost of non-monetary benefits as overheads.



3.10 EFFICIENCY RATING PROCEDURES

Efficiency is usually related with performance and may be computed by comparing the time taken with the standard time allotted to perform the given job/task.

If the time taken by a worker on a job equals or less than the standard time, then he is rated efficient.

In case he takes more time than the standard time he is rated as inefficient.

$$\text{Efficiency in \%} = \frac{\text{Time allowed as per standard}}{\text{Time Taken}} \times 100$$

For efficiency rating of employees the following procedures may be followed:

1. Determining standard time/performance standards: The first step is to determine the standard time taken by a worker for performing a particular job/task. *The standard time can be determined by using Time & Motion study or Work study techniques.* While determining the standard time for a job/task a heterogeneous group of workers is taken and contingency allowances are added for determining standard time.

2. Measuring Actual Performance of workers: For computing efficiency rating it is necessary to develop a procedure for recording the actual performance of workers. The system developed should record the output of each worker along with the time taken by him.

3. Computation of efficiency rating: The efficiency rating of each worker can be computed by using the above mentioned Formula.

3.10.1 Need for efficiency rating

- As discussed earlier when a firm follows a system of payment by results, the payment has a direct relationship with the output given by a worker. The firm for making payment to worker is required to ascertain his efficiency level. For instance, under *Taylor's differential piece work system* the lower rate i.e. 83% of piece rate is given to a worker when his efficiency rating is less than 100% and higher rate viz., 125% of piece rate is offered at efficiency level of either 100% or more. Similarly, under *Emersion efficiency plans* bonus is paid at rising scale at various level of efficiency, ranging from 66.67% to 150%.
- The efficiency rating also helps the management in preparing employee requirement budget or for preparing manpower requirements.

Example - 1: P Ltd. manufactures two products by using one grade of employees. The following estimates are available:

	Product- A	Product- B
Budgeted production (units)	3,480	4,000
Standard hours allowed per product	5	4

It is further worked out that the efficiency rating (efficiency ratio) for productive hours worked by direct workers in actually manufacturing the production is 80% then the exact standard employee-hours requirement can be worked out as follows:

	Product- A	Product- B	Total
Budgeted production (units)	3,480	4,000	
Standard hours allowed for budgeted production	17,400 (3,480 units × 5 hours)	16,000 (4,000 units × 4 hours)	33,400

Since efficiency ratio is given as 80% therefore standard employee hours required for 100% efficiency level is $\left(33,400 \text{ hours} \times \frac{100}{80}\right) = 41,750 \text{ hours}$.

Employee Productivity: *Productivity is generally determined by the input/output ratio. In case of employees, it is calculated as below:*

$$\frac{\text{Standard time for doing actual work}}{\text{Actual time taken}}$$

Employee productivity is used for measuring the efficiency of individual workers. It is an index of efficiency in the utilisation of human resources, materials, capital, power and all kinds of services and facilities.

It is measured by the output in relation to input. Productivity can be improved by reducing the input for a certain quantity or value of output or by increasing the output from the same given quantity or value of input.

Factors for increasing Employee productivity: The important factors which must be taken into consideration for increasing employee productivity are as follows:

1. Employing only those workers who possess the right type of skill.
2. Placing a right type of person to a right job.
3. Training young and old workers by providing them the right types of opportunities.
4. Taking appropriate measures to avoid the situation of excess or shortage of employees.
5. Carrying out work study for fixation of wages and for the simplification and standardisation of work.



3.11 EMPLOYEE (LABOUR) TURNOVER

3.11.1 Employee (Labour) Turnover

Employee turnover or labour turnover in an organisation is the rate of change in the composition of employee force during a specified period measured against a suitable index.

The standard of usual employee turnover in the industry or locality or the employee turnover rate for a past period may be taken as the index or norm against which actual turnover rate is compared.

There are three methods of calculating Employee turnover which are given below:

- (i) **Replacement Method:** This method takes into consideration *actual replacement* of employees irrespective of number of persons leaving the organisation. Employee Turnover under this method is calculated as under:

$$\frac{\text{Number of employees Replaced during the period}}{\text{Average number of employees during the period on roll}} \times 100$$

New employees appointed on account of expansion plan of the organisation are not included in number of replacements.

- (ii) **Separation Method:** In this method employee turnover is measured by dividing the total number of employees separated during the period by the average total number of employees on payroll during the same period. Employee Turnover under this method is calculated as under:

$$\frac{\text{Number of employees Separated during the period}}{\text{Average number of employees during the period on roll}} \times 100$$

- (iii) **Flux Method:** This method takes **both the number of replacements as well as the number of separations** during the period into account for calculation of employee turnover. Employee Turnover under this method is calculated as under:

$$\frac{\text{Number of employees Separated} + \text{Number of employees Replaced during the period}}{\text{Average number of employees during the period on roll}} \times 100$$

Employee turnover due to new recruitment: Generally, employees recruited on account of expansion of an organisation, are not considered for calculation of employee turnover. But it is considered that the newly recruited employees are also responsible for changes in the composition or work force. Due to this feature, some management accountants feel to take new recruitment for calculating employee turnover. **The total number of workers joining, including replacements, is called accessions.**

When number of accessions are considered for measuring employee turnover, the employee turnover rate by Flux method may be computed by using any one of the following expressions:

$$\frac{\text{No. of Separation} + \text{No. of Replacements} + \text{No. of new Joinings}}{\text{Average no. of employees during the period on roll}} \times 100$$

Or

$$\frac{\text{No. of Separations} + \text{No. of Accessions}}{\text{Average no. of employees during the period on roll}} \times 100$$

Average number of employees during the period is calculated as follows:

$$= \frac{\text{No. of employees at beginning} + \text{No. of employees at end of the period}}{2}$$

Equivalent Employee (Labour) Turnover rate:

If in the above computations, the data given is for a period other than a year, the employee turnover rate so computed may be converted into equivalent annual employee turnover rate by using the following formula:

$$\frac{\text{Employee Turnover rate for the period}}{\text{Number of days in the period}} \times 365$$

ILLUSTRATION 14

The Accountant of Y Ltd. has computed employee turnover rates for the quarter ended 31st March, 2020 as 10%, 5% and 3% respectively under 'Flux method', 'Replacement method' and 'Separation method' respectively. If the number of workers replaced during that quarter is 30, FIND OUT the number of workers for the quarter

(i) recruited and joined and (ii) left and discharged and (iii) Equivalent employee turnover rates for the year.

SOLUTION

Working Note:

Average number of workers on roll (for the quarter):

Employee Turnover rate using Replacement method

$$= \frac{\text{No. of replacements}}{\text{Average number of workers on roll}} \times 100$$

$$\text{Or, } \frac{5}{100} = \frac{30}{\text{Average number of workers on roll}}$$

$$\text{Or, Average number of workers on roll} = \frac{30 \times 100}{5} = 600$$

(i) Number of workers recruited and joined:

Employee turnover rate (Flux method)

$$= \frac{\text{No. of Separations} * (S) + \text{No. of Accessions} (A)}{\text{Average number of workers on roll}}$$

$$\text{Or, } \frac{10}{100} = \frac{18^* + A}{600} \quad \text{Or, } A = \left[\frac{6000}{100} - 80 \right] = 42$$

No. of workers recruited and joined 42.

(ii) Number of workers left and discharged:

Employee turnover rate (Separation method)

$$= \frac{\text{No. of Separations} (S)}{\text{Average number of workers on roll}} \times 100 = \frac{3}{100} = \frac{S}{600} \quad \text{Or, } S^* = 18$$

Hence, number of workers left and discharged comes to 18

(iii) Calculation of Equivalent employee turnover rates:

$$= \frac{\text{Employee Turnover rate for the quarter(s)}}{\text{Number of quarter(s)}} \times 4 \text{ quarters}$$

$$\text{Using Flux method} = \frac{10\%}{1} \times 4 = 40\%$$

$$\text{Using Replacement method} = \frac{5\%}{1} \times 4 = 20\%$$

$$\text{Using Separation method} = \frac{3\%}{1} \times 4 = 12\%$$

3.11.2 Causes of Employee (Labour) Turnover:

The reasons for employee turnover in an organisation can be classified under the following three heads:

- (a) Personal Causes;
- (b) Unavoidable Causes; and
- (c) Avoidable Causes.

(a) Personal causes: All the personal reasons which induce or compel an employee to leave his job; such causes include the following:

- (i) Change of jobs for betterment.
- (ii) Premature retirement due to ill health or old age.
- (iii) Domestic problems and family responsibilities.
- (iv) Discontent over the jobs and working environment.

In all the above cases the employee leaves the organisation at his will and, therefore, it is difficult to suggest any possible remedy in the first three cases.

But the last one can be overcome by creating conditions leading to a healthy working environment. For this, officers should play a positive role and make sure that their subordinates work under healthy working conditions.

(b) Unavoidable Causes: Unavoidable causes are those under which it becomes obligatory on the part of management to ask one or more of their employees to leave the organisation; such causes are summed up as listed below:

- (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) Disability, making a worker unfit for work;
- (v) Disciplinary measures;

(c) Avoidable Causes: Avoidable causes are those which require the attention of management on a continuous basis so as to keep employee turnover ratio as low as possible. The main causes under this case are indicated below:

- (1) Dissatisfaction with job, remuneration, hours of work, working conditions, etc.,
- (2) Strained relationship with management, supervisors or fellow workers;
- (3) Lack of training facilities and promotional avenues;
- (4) Lack of recreational and medical facilities;
- (5) Low wages and allowances.

Proper and timely management action can reduce the employee turnover appreciably so far as avoidable causes are concerned.

3.11.3 Effects of Employee (Labour) Turnover:

High employee turnover increases the cost of production in the following ways:

- (i) Even flow of production is disturbed;
- (ii) Efficiency of new workers is low; productivity of new but experienced workers is low in the beginning;
- (iii) There is increased cost of training and induction;
- (iv) New workers cause increased breakage of tools, wastage of materials, etc.
- (v) Cost of recruitment and training increases.

Cost of Employees (Labour) Turnover: Two types of costs which are associated with employee turnover are:

(a) Preventive Costs: The cost incurred to prevent employee turnover or keep it as lowest as possible. Cost incurred for prevention of employee turnover includes the following:

- (i) Cost of medical benefit provided to the employees;
- (ii) Cost incurred on employees' welfare like pension etc.
- (iii) Cost on other benefits with an objective to retain employees.

(b) Replacement Costs: These are the costs which arise due to employee turnover. If employees leave soon after they acquire the necessary training and experience of good work, additional costs will have to be incurred on new workers, i.e., cost of recruitment, training and induction, abnormal breakage and scrap and extra wages and overheads due to the inefficiency of new workers.

It is obvious that a company will incur very high replacement costs if the rate of employee turnover is high. Similarly, only adequate preventive costs can keep Employee turnover at a low level. Each company must, therefore, work out the optimum level of Employee turnover keeping in view its personnel policies and the behaviour of replacement cost and preventive costs at various levels of Employee turnover rates.

ILLUSTRATION 15

The management of B.R Ltd. is worried about their increasing employee turnover in the factory and before analyzing the causes and taking remedial steps; it wants to have an idea of the profit foregone as a result of employee turnover in the last year.

Last year sales amounted to ₹83,03,300 and P/V ratio was 20 per cent. The total number of actual hours worked by the direct employee force was 4.45 lakhs. The actual direct employee hours included 30,000 hours attributable to training new recruits, out of which half of the hours were unproductive. As a result of the delays by the Personnel Department in filling vacancies due to employee turnover, 1,00,000 potentially productive hours (excluding unproductive training hours) were lost.

The costs incurred consequent on employee turnover revealed, on analysis, the following:

Settlement cost due to leaving	₹43,820
Recruitment costs	₹26,740
Selection costs	₹12,750
Training costs	₹30,490

Assuming that the potential production lost as a consequence of employee turnover could have been sold at prevailing prices, FIND the profit foregone last year on account of employee turnover.

SOLUTION

Workings:

(i) Computation of productive hours

Actual hours worked (given)	4,45,000
Less: Unproductive training hours	<u>15,000</u>
Actual productive hours	<u>4,30,000</u>

(ii) Productive hours lost:

Loss of potential productive hours + Unproductive training hours
 = 1,00,000 + 15,000 = 1,15,000 hours

(iii) Loss of contribution due to unproductive hours:

$$\begin{aligned}
 &= \frac{\text{Sales value}}{\text{Actual productive hours}} \times \text{Total unproductive hours} \\
 &= \frac{\text{₹83,03,300}}{4,30,000 \text{ hrs}} \times 1,15,000 \text{ hours} = \text{₹22,20,650}
 \end{aligned}$$

$$\text{Contribution lost for 1,15,000 hours} = \frac{\text{₹ } 22,20,650}{100} \times 20 = \text{₹ } 4,44,130$$

Computation of profit forgone on account of employee turnover

	(₹)
Contribution foregone (as calculated above)	4,44,130
Settlement cost due to leaving	43,820
Recruitment cost	26,740
Selection cost	12,750
Training costs	30,490
Profit foregone	5,57,930

SUMMARY

Employee Cost: Benefits paid or payable to the employees of an entity, whether permanent or temporary for the services rendered by them. Employee cost includes payments made in cash or kind.

Direct Employee (Labour) Cost: Benefits paid or payable to the employees which can be attributed to a cost object in an economically feasible manner.

Indirect Employee (Labour) Cost: Benefits paid or payable to the employees, which cannot be directly attributable to a particular cost object in an economically feasible manner.

Idle Time: The time for which the employer pays but obtains no direct benefit or for no productive purpose.

Normal Idle Time: Time which cannot be avoided or reduced in the normal course of business. The cost of normal idle time should be charged to the cost of production.

Abnormal Idle Time: It arises on account of abnormal causes and should be charged to Costing Profit and Loss account.

Time Keeping: It refers to recording and keeping of the employees' attendance time.

Time Booking: It is basically recording the details of work done and the time spent by an employee on each job or process.

Overtime: Payment to employees, when an employee works beyond the normal working hours. Usually overtime has to be paid at double the rate of normal hours.

Overtime Premium: It's the amount of extra payment paid to an employee for extra work.

Employee (Labour) Turnover: It is the rate of change in employee force during a specified period due to resignation, retirement and retrenchment. If the employee turnover is high, it's a sign of instability and may affect the profitability of the firm.

Employee (Labour) turnover can be measured through the following methods:

(i) Replacement Method:

$$\frac{\text{Number of employees replaced}}{\text{Average number of employees on roll}} \times 100$$

(ii) Separation Method:

$$\frac{\text{Number of employees separated during the year}}{\text{Average number of employees on rolls during the period}} \times 100$$

(iii) Flux Method

$$\frac{\text{Number of employees separated} + \text{number of employees replacements}}{\text{Average number of employees on rolls during the period}} \times 100$$

(iv) Employee turnover due to new recruitment:

$$\frac{\text{Number of new employees joining in a period (excluding replacements)}}{\text{Average number of employees on the roll in a period}} \times 100$$

(v) Employee turnover including accessions:

$$\frac{\text{Number of new employees joining in a period (excluding replacements)}}{\text{Average number of employees on the roll in a period}} \times 100$$

OR

$$\frac{\text{Number of separations} + \text{number of accessions}}{\text{Average number of employees}} \times 100$$

Time Rate System: The system of wage payment where wages to an employee is paid on the basis of time irrespective of production volume.

Straight Piece Work: The system of wage payment where wages is paid on the basis of number of units produced irrespective of time spent for production.

Calculation takes number of units produced by the employee multiplied by rate per unit.

Halsey System: Time taken \times Time rate + 50% of time saved \times Time rate.

Rowan System: Time taken \times Rate per hour + $\frac{\text{Time Saved}}{\text{Time allowed}} \times \text{Time taken} \times \text{Rate}$ per hour

TEST YOUR KNOWLEDGE

MCQs based Questions

1. Idle time is the time under which-
 - (a) Full wages are paid to workers
 - (b) No productivity is given by the workers
 - (c) Both (a) and (b)
 - (d) None of the above
2. Cost of idle time due to non-availability of raw material is-
 - (a) Charged to overhead costs
 - (b) Charged to respective jobs
 - (c) Charged to costing profit and loss account
 - (d) None of the above
3. Time and motion study is conducted by-
 - (a) Time keeping department
 - (b) Personal department
 - (c) Payroll department
 - (d) Engineering department
4. Identify, which one of the following, does not account for increasing labour productivity-
 - (a) Job satisfaction
 - (b) Motivating workers
 - (c) High labour turnover
 - (d) Proper supervision and control

5. Labour turnover is measured by-
- (a) Number of persons replaced/ average number of workers
 - (b) Numbers of persons separated / number of workers at the beginning of the year
 - (c) $(\text{Number of persons replaced} + \text{number of persons separated}) / (\text{number of persons at the beginning} + \text{the number of persons at the end of the year})$
 - (d) None of the above
6. Labour productivity is measured by comparing-
- (a) Actual time and standard time
 - (b) Total output with total man-hours
 - (c) Added value for the product with total wage cost
 - (d) All of the above
7. Employee Cost includes-
- (a) Wages and salaries
 - (b) Allowances and incentives
 - (c) Payment for overtime
 - (d) All of the above
8. If the time saved is less than 50% of the standard time, then the wages under Rowan and Halsey premium plan on comparison gives-
- (a) More wages to workers under Rowan plan than Halsey plan
 - (b) More wages to workers under Halsey plan than Rowan plan
 - (c) Equal wages under two plans
 - (d) None of the above
9. Standard time of a job is 60 hours and guaranteed time rate is ₹0.30 per hour. What is the amount of wages under Rowan plan if job is completed in 48 hours?
- (a) ₹ 16.20
 - (b) ₹ 17.28
 - (c) ₹ 18.00
 - (d) ₹ 14.40

10. Important factors for control of employee cost can be-
 - (a) Time and Motion Study
 - (b) Control over idle time and overtime
 - (c) Control over employee turnover
 - (d) All of the above
11. Out of the following methods attendance is marked by recognizing an employee based on physical and behavioural traits-
 - (a) Punch Card Attendance method
 - (b) Bio- Metric Attendance system
 - (c) Attendance Register method
 - (d) Token Method
12. If overtime is required for meeting urgent orders, the overtime premium should be charged as-
 - (a) Respective job
 - (b) Overhead cost
 - (c) Costing P& L A/c
 - (d) None of above

Theoretical Questions

1. DISCUSS the accounting treatment of Idle time and overtime wages.
2. DISCUSS the effect of overtime payment on productivity.
3. STATE the circumstances in which time rate system of wage payment can be preferred in a factory.
4. DISCUSS the objectives of time keeping & time booking.
5. DISCUSS the two types of cost associated with labour turnover.
6. DESCRIBE briefly, how wages may be calculated under the following systems:
 - (i) Rowan system
 - (ii) Halsey system

Practical Questions

- Mr. A. is working by employing 10 skilled workers. He is considering the introduction of some incentive scheme - either Halsey Scheme (with 50% bonus) or Rowan Scheme - of wage payment for increasing the Employee productivity to cope with the increased demand for the product by 25%. He feels that if the proposed incentive scheme could bring about an average 20% increase over the present earnings of the workers, it could act as sufficient incentive for them to produce more and he has accordingly given this assurance to the workers.

As a result of the assurance, the increase in productivity has been observed as revealed by the following figures for the current month:

Hourly rate of wages (guaranteed)	₹40
Average time for producing 1 piece by one worker at the previous performance (This may be taken as time allowed)	2 hours
No. of working days in the month	25
No. of working hours per day for each worker	8
Actual production during the month	1,250 units

Required:

- CALCULATE effective rate of earnings per hour under Halsey Scheme and Rowan Scheme.
 - CALCULATE the savings to Mr. A in terms of direct labour cost per piece under the schemes.
- Wage negotiations are going on with the recognised employees' union, and the management wants you as an executive of the company to formulate an incentive scheme with a view to increase productivity.

The case of three typical workers A, B and C who produce respectively 180, 120 and 100 units of the company's product in a normal day of 8 hours is taken up for study.

Assuming that day wages would be guaranteed at ₹ 75 per hour and the piece rate would be based on a standard hourly output of 10 units, CALCULATE the earnings of each of the three workers and the employee cost per 100 pieces under (i) Day wages, (ii) Piece rate, (iii) Halsey scheme, and (iv) The Rowan scheme.

Also CALCULATE under the above schemes the average cost of labour for the company to produce 100 pieces.

ANSWERS/ SOLUTIONS

MCQs based Questions

1. (c) 2. (c) 3. (d) 4. (c) 5. (d) 6. (d)
7. (d) 8. (a) 9. (b) 10. (d) 11. (b) 12. (a)

Theoretical Questions

1. Please refer paragraph 3.5 & 3.6
2. Please refer paragraph 3.6
3. Please refer paragraph 3.8.1
4. Please refer paragraph 3.4
5. Please refer paragraph 3.11
6. Please refer paragraph 3.8

Practical Questions

1. Working Notes:

1. Total time wages of 10 workers per month:

$$= \text{No. of working days in the month} \times \text{No. of working hours per day of each worker} \times \text{Hourly rate of wages} \times \text{No. of workers}$$

$$= 25 \text{ days} \times 8 \text{ hrs.} \times ₹40 \times 10 \text{ workers} = ₹80,000$$
2. Time saved per month:

Time allowed per piece to a worker	2 hours
No. of units produced during the month by 10 workers	1,250 pieces
Total time allowed to produce 1,250 pieces ($1,250 \times 2$ hours)	2,500 hours
Actual time taken to produce 1,250 pieces	2,000 hours
Time saved ($2,500 \text{ hours} - 2,000 \text{ hours}$)	500 hours

3. Bonus under Halsey scheme to be paid to 10 workers:

$$\begin{aligned}\text{Bonus} &= (50\% \text{ of time saved}) \times \text{hourly rate of wages} \\ &= 50/100 \times 500 \text{ hours} \times ₹40 = ₹10,000\end{aligned}$$

Total wages to be paid to 10 workers are (₹80,000 + ₹10,000) ₹90,000, if Mr. A considers the introduction of Halsey Incentive Scheme to increase the employee productivity.

4. Bonus under Rowan Scheme to be paid to 10 workers:

$$\begin{aligned}\text{Bonus} &= \frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{hourly rate} \\ &= \frac{2,000 \text{ hours}}{2,500 \text{ hours}} \times 500 \text{ hours} \times ₹40 = ₹16,000\end{aligned}$$

Total wages to be paid to 10 workers are (₹80,000 + ₹16,000) ₹96,000, if Mr. A considers the introduction of Rowan Incentive Scheme to increase the Employee productivity.

- (i) (a) Effective hourly rate of earnings under Halsey scheme:

(Refer to Working Notes 1, 2 and 3)

$$\begin{aligned}&= \frac{\text{Total time wages of 10 workers} + \text{Total bonus under Halsey scheme}}{\text{Total hours worked}} \\ &= \frac{₹80,000 + ₹10,000}{2,000 \text{ hours}} = ₹45\end{aligned}$$

- (b) Effective hourly rate of earnings under Rowan scheme:

(Refer to Working Notes 1, 2 and 4)

$$\begin{aligned}&= \frac{\text{Total time wages of 10 workers} + \text{Total bonus under Rowan scheme}}{\text{Total hours worked}} \\ &= \frac{₹80,000 + ₹16,000}{2,000 \text{ hours}} = ₹48\end{aligned}$$

- (ii) (a) Saving in terms of direct Employee cost per piece under Halsey scheme:

(Refer to Working Note 3)

Employee cost per piece (under time wage scheme)

$$= 2 \text{ hours} \times ₹40 = ₹80.$$

Employee cost per piece (under Halsey scheme)

$$= \frac{\text{Total wages paid under the scheme}}{\text{Total number of units produced}} = \frac{₹90,000}{1,250} = ₹72$$

$$\text{Saving per piece: } (₹80 - ₹72) = ₹8$$

(b) Saving in terms of direct Employee cost per piece under Rowan Scheme:

(Refer to Working Note 4)

$$\begin{aligned} \text{Employee cost per piece under Rowan scheme} \\ = ₹96,000 / 1,250 \text{ units} = ₹76.80 \end{aligned}$$

$$\text{Saving per piece} = ₹80 - ₹76.80 = ₹3.20$$

2. Calculation of earnings under different wage schemes:

(i) Day wages

Worker	Day wages (₹)	Actual Output (Units)	Labour cost per 100 pieces (₹)
A	600	180	333.33
B	600	120	500.00
C	600	100	600.00
Total	1,800	400	

Average labour cost to produce 100 pieces:

$$= \frac{\text{Total wages paid}}{\text{Total output}} \times 100 = \frac{₹1,800}{400 \text{ units}} \times 100 = ₹450$$

(ii) Piece rate

Worker	Actual Output (Units)	Piece rate (₹)	Wages earned (₹)	Labour cost per 100 pieces (₹)
A	180	7.50	1,350	750.00
B	120	7.50	900	750.00
C	100	7.50	750	750.00
Total	400		3,000	

Average cost of labour for the company to produce 100 pieces:

$$= \frac{₹ 3,000}{400 \text{ units}} \times 100 = ₹ 750$$

(iii) Halsey Scheme

Worker	Actual Output (Units)	Std. time (Hrs.)	Actual time (Hrs.)	Time saved (Hrs.)	Bonus hours (50% of time saved)	Rate per hour (₹)	Total wages (₹)	Labour cost per 100 pieces (₹)
	A	B	C	D=B-C	E	F	G = F x (C+E)	H=G/A*100
A	180	18	8	10	5	75	975	541.67
B	120	12	8	4	2	75	750	625.00
C	100	10	8	2	1	75	675	675.00
Total	400						2,400	

Average cost of labour for the company to produce 100 pieces =

$$\frac{₹ 2,400}{400 \text{ units}} \times 100 = ₹ 600$$

(iv) Rowan Scheme:

Worker	Actual Output (Units)	Std. time (Hrs.)	Actual time (Hrs.)	Time saved (Hrs.)	Bonus hours*	Rate per hour (₹)	Total wages including bonus (₹)	Labour cost per 100 pieces (₹)
	A	B	C	D=B-C	E	F	G=F×(C+E)	H=G/A*100
A	180	18	8	10	4.44	75	933	518.33
B	120	12	8	4	2.67	75	800	666.67
C	100	10	8	2	1.60	75	720	720.00
Total	400						2,453	

$$* \text{ Bonus hours} = \frac{\text{Time Saved}}{\text{Std. Time}} \times \text{Actual time}$$

Average cost of labour for the company to produce 100 pieces

$$= \frac{₹ 2,453}{400 \text{ units}} \times 100 = ₹ 613.25$$