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UNIT NO. II

LESSON NO. 2.1

LABOUR : MEANING, COMPONENTS OF LABOUR COST

STRUCTURE OF THE LESSON

2.1.0 OBJECTIVE

The main objective of this lesson is to introduce the students with the meaning and various components of labour cost. After studying this lesson students would be able to describe the control procedure by focusing on the (1) Personnel department, (2) Engineering Department, (3) Motion Study department, (4) Time keeping department, (5) Pay roll department, and (6) Cost accounting department.

2.1.1 INTRODUCTION

Labour cost, representing the human contribution in production is an important cost factor which requires constant control, measurement and analysis. Control and accounting for labour costs constitutes one of the most important problems of management in the operation of a business enterprise and in determination of the cost of manufacturing a product or to render a service. Just like material, labour is also of two types : (i) Direct labour (ii) Indirect labour.

Direct Labour :

Labour directly engaged in the production of goods or services and which can be conveniently allocated to a particular job, process, commodity or unit is called direct labour. Thus, wages paid to workers engaged in manufacturing job or process like brick laying, spinning and weaving are the example of direct labour cost.

Indirect labour Cost :

The part of labour cost which cannot be directly related to production of specific goods of services, but are incurred on carrying out manufacturing activities generally, are called indirect labour cost. The examples of such labour are machines supervisions, chowkidars, sweepers, foremen, watchman, time keeper, cleaners, repairer etc. The cost of such labour cannot be conveniently allocated to a particular job, process or article.

2.1.2 COMPONENTS OF LABOUR COST

Labour cost consists of the various items of expenditure incurred on workers by the employers which can be classified as monetary benefits and fringe benefits. 6.2.1 Monetary Benefits : Monetary benefits include the payments made by the employer to the worker in various forms. It includes the following :

(i) Basic Wages;
(ii) Dearness Allowance;
(iii) Employer's Contribution to Provident Fund;
(iv) Employer's Contribution to Employee's State Insurance (ESI) Scheme;
(v) Production Bonus;
(vi) Profit Bonus ;
(vii) Old Age Pension ;
(viii) Retirement Gratuity.

2.1.2.2 Fringe Benefits : Fringe benefits include the indirect benefits provided by the employers to its employees and their dependents and involves cost to the organization. These benefits include ;

(i) Subsidised Food ;
(ii) Subsidised Housing ;
(iii) Medical Facilities ;
(iv) Holidays pay ;
(v) Recreational facilities.

The total of these Monetary as well as Non-Monetary benefits given to the workers should be sufficient enough to attract and retain the labour force and motivate them with consequent increase in efficiency.

2.1.3 CONTROL OVER LABOUR COST

Labour costs constitute a significant portion of the total cost of product of product therefore, economic utilization of labour is the need of the present day industry to reduce the cost of production of the products manufactured or services rendered. Therefore, control over labour costs is the need of the hour. Broadly, there are six departments requiring control over labour cost :

(1) Personnel Department
(2) Engineering Department
(3) Rate or Time and Motion Study Department
(4) Time-Keeping Department
(5) Pay-roll Department
(6) Cost Accounting Department.

2.1.3.1 Personnel Department

Execution of policies regarding the recruitment, discharge, classification of employees and wages which have been laid down by the Board of Directors or a committee of executive is the responsibility of the personnel department. The process of recruitment with the receipt of employees placement requisition by the personnel department from department requiring such a person. Thereafter the personnel department receives the applications, interviews the applicants, selects them and informs the department in need of workers about the selection.

In order to maintain proper control on the recruitment of labour, following steps should be taken :

1. Every recruitment should be made through the personnel department.
2. The manager should examine each employee's placement requisition and see whether there is any possibility of transferring surplus labour to other areas.
3. Employment of casual or temporary workers would be preferred to recruitment of permanent workers if additional labour is not urgently required.
4. Preventive steps should be taken to reduce absentism and inefficiency if the additional labour is essential.
5. Labour utilization reports should be introduced in every department.
6. Mechanisation of operations should be considered if it is helpful in reducing conditions costs.

2.1.3.2 Engineering Department

Engineering department is needed to exercise proper control over working conditions and production methods for each job and department by performing the following functions :

1. Preparation of plans and specifications for each job schedule for production.

2. Inspection of jobs at successive stages of production and at the completion of production.
3. Maintenance of safety and efficient working conditions.
4. Conducting research and experimental work.

2.1.3.3 Rate of Time and Motion Study Department

This department works with close co-ordination with the personnel, engineering and cost departments. Making time and motion studies of labour and plant operations, making job analysis and setting piece rates are the main functions of the department.

1. Motion Study :

In department the best way of performing the operation is made possible by motion studv. The movement of the worker or a machine in performing an operation for the purpose of eliminating useless, ill-directed and inefficient motions to improve productivity. For conducting Motion Study, workers are studied at their jobs and all their movements and motions are noted. Each movement is know as 'therbling'. Time spend on each therbling involved in an operation is collected by the use of stop-watch. All motions are studied carefully to determine the motions which are needed to perform operations efficiently.

2. Time Study :

This may be defined as the art of observing and recording the time required to do each detailed element of an industrial operation. Before studying the time required for a job, the job is divided into a number of operations which are studied separately and the time needed for their completion is ascertained. This study is conducted after the motion study. In computing the time required to fix standard time to do each operation is advisable to use normal workers rather than exceptionally fast or slow workers. Provision should also be made to allow some time for fatigue and personal requirements of workers.

Advantages of Time and Motion Study :

Time and Motion study helps in the fixation of wage rates and introduction of incentive schemes. With the introduction of correct and proper tools, the wasteful motions of the workers are eliminated and the efficiency of workers is improved. The management can pay attention to the causes of idle time of men and machines. The labour requirements are correctly assessed, and budgeting of labour cost is facilitated. Cost control is possible through proper planning with the help of these studies.

3. Job Analysis :

This may be defined as the ranking, grading and weighing of all work characteristics i.e. skill, effort, responsibility etc. of all jobs and is concerned with putting money values on them. This analysis is made in respect of each job to determine a list of

qualification needed by workers to perform the work satisfactory.

Job analysis helps in fixing suitable rates for different jobs because rates are fixed keeping in view the work characteristics of the jobs. It affords no space for personal prejudices in establishing rates to favour certain employees because in job evaluation, the job is rated and not the employee. It also help, in the selection of right type of worker. Exact knowledge of the work and working conditions is urgently required to settle disputes of workers as to duties and to serve as a basis for the assignment of new duties to workers.

2.1.3.4 Time Keeping Department

Recording of time of each worker engaged in the factory is the primary function of this department. Recording of time is required for two purposes i.e. for time keeping and time booking. Time keeping is concerned with recording the time of workers for the purpose of attendance and wage calculations, whereas time booking is the reporting of each worker's time for each department, operation and job. The purposes of a cost analysis and apportionment of labour costs between various jobs and departments, reconciliation of these two recording is required to establish the accuracy of recording of time because wages calculated on the basis of time-keeping should agree with the wages charged to the various or production orders on the basis of time booking.

Time Keeping :

Time keeping help in preparation of Pay Rolls in case of time paid workers, meeting the statutory requirements ensuring discipline in attendance and recording of each worker's time 'in' and 'out' of the factory making distinction between normal time, over time, late attendance and early leaving.

Methods of Time Keeping :

Time keeping may be either manual or mechanical. In manual time keeping, an Attendance Register is maintained or Metal disc method is employed, where an attendance register is maintained, it is to be kept at the factory gate and the worker is required to enter the time of arrival and departure in this register. The time may be noted by the workers themselves or by an employee known as time-keeper appointed for this purpose. This method is simple and can be used in small industries. This method may lead to dishonest practice of recording wrong time by the time- keeper when he behaves partially towards some workers.

Under Metal Disc Method each worker is allotted as metal disc or a token with a whole bearing his identification number. A board is kept at the gate with pegs on it and all tokens are hung on this board without undue delay. As the workers enter the factory gate remove their respective discs or tokens and place them in a box or tray kept near to the board. Immediately after the scheduled time for entering the factory, the box is removed and the late-comers will have to give their tokens to the time-keeper personally

so that exact time of their arrival could be recorded. The discs or tokens still left on the board represent the absentee workers. Later, the time-keeper records the attendance in a register knows as daily muster roll which is subsequently passed on the Pay Roll Department.

This method is simple because illiterate workers can easily recognize tokens and put in the box. However, there are chances that a worker may try to remove his companion's token from the board in order to get his presence marked in time when he is actually late or absent. Moreover, there are chances of disputes regarding the exact time of arrival of a worker due to human error or deliberations. Further there are chances of inclusion of dummy or ghost workers by the time-keeper in the attendance register or Daily Muster Roll.

1. Mechanical Method :

The mechanical methods generally used for the recording of workers are Time Recording Clocks and Dial Time Records. The time recording clock is a mechanical device which automatically records the time of the workers. This method has been developed to overcome some of the difficulties experienced in case of manual methods and in this method, each worker is given a Time Card usually of one week duration. Time Cards are serially arranged in a tray near the factory gate and the worker enters the gate, he picks-up his card from the tray, puts it in the time recording clock which prints the exact time of arrival in the proper space against the particular day. This process is repeated for recording time departure, for lunch, returns from lunch and time of leaving the factory. Late arrivals, early leaving and overtime are printed in red to attract the attention of the management.

Under this methods there are no chances of disputes arising in connection with recording to time of workers because time is recorded by the time recording clock and not by the time-keeper.

Though there is no scope for partiality or carelessness of the time-keeper as it is in case of manual method. But this method still suffers from some defects. For example, still there are chances that a worker may try to get his friend's card from tray to get him marked present in time when he is actually late or get his presence marked when he is absent. This drawback can be removed if the time-keeper does not show carelessness. There are chances of the work of recording of time being dislocated when the time recording clock goes out of order. The management should also take care of such an eventuality.

2. Dial Time Records :

The dial time records is a machine which has a dial around the clock. This dial has a number of holes and each hole bears a number corresponding to the identification number of the worker concerned. There is one redial arm at the centre of the dial. As a

worker enters the factory gate, he is to press the redial arm after placing it at the hole of his number and his time will automatically be recorded on roll of paper inside the dial time recorded against his number. This sheet on which the time is recorded provides a running account of the worker's time. This machine allows greater accuracy and can also calculate the wages of the workers and that avoids much loss of time.

3. Time Booking :

Time booking is the recording of time spent by the worker on the different jobs or work orders carried out by him during his period of attendance in the factory. This is done to ensure that time paid for according to time keeping is utilized on different jobs or work orders and to ascertain the labour-cost of each individual job or work order. Time booking also serves as a basis for apportionment of overhead expenses over various jobs or work orders when the method for the allocation of overheads depends upon time spent on different jobs. Unproductive time or idle time can also be kept in limit. It is done with the help of Daily time sheets, weekly time sheets and job tickets or job cards.

Daily Time Sheet

Name of worker..... No. .....
Token No. ..... Date .....
Department.....

Job or work Order No.	work done	description of work done	Time		Total Hours		Cost	
			On	Off	Ordinary	Overtime	Rate	Amount

Total hours..... Worker.....
Total Cost..... Foreman.....

Non-diversifiable risk is that part of the total risk which is related to the general economy or stock market as a whole and hence cannot be eliminated by diversification. This is also referred to as systematic risk. Examples are tax ratio, war, inflation rates etc.

Weekly Time Sheet

Name of worker..... Departmen .....
Token No. ..... Hourly Rate .....
Trade or Grade..... Week Ending.....

Day		Regular time		Overtime		Total Time	
Monday	A.M	In	Out	In	Out	Normal Time	Overtime
	P.M						
Tuesday	A.M						
	P.M						
Wednesday	A.M						
	P.M						
Thursday	A.M						
	P.M						
Friday	A.M						
	P.M						
Saturday	A.M						
	P.M						
Sunday	A.M						
	P.M						

Foreman..... Entered in Wage Sheet by
Worker..... .....

Combined Time and Job Card

Name of worker..... Week Ending.....
Token No. ..... Department.....

Day	Job No.	Time		Total		Wage Rate	Amount
		On	Off	Normal	Overtime	Rs.	Rs.
Monday							
Tuesday							
Wednesday							
Thursday							
Friday							
Saturday							
Sunday							

worker..... Total Wages .....
Entered in Wage Sheet by..... Foreman .....

Reconciliation of Gate Time (or time keeping) with time booked (or time booking) :

Time booking to different jobs or work orders should agree with gate time. But in real practice it does not happen due to many reasons e.g time taken in geeting from the

factory gate to the department in which the worker is engaged, time lost in waiting for materials, tools and instrutions, time lost due to breakdown of machinery or power failure, etc. Therefore, Idle Time Card should be prepared to record the time which has been wasted. Time shown by time card will agree with the time shown in the job card and Idle time card. A specimen of the idle time card is given below :

Idle Time Card

Worker Name..... Date .....
Worker's No..... Department.....

Reasons of Idle Time	Time		Time Lost	For Cost Office		Remarks
	On	Out		Rate	Amount	
1. Waiting for materials 2. Waiting for tools 3. Waiting for instructions 4. Machine breakdown 5. Power Failure 6. Other reasons						

Worker.....
Costed by ..... Foreman.....

Idle Time :

We have already seen that there is bound to be some difference between the time booked to different jobs or work orders and gate time. This difference is know as Idle Time. We may also say that it is a time for which the employer pays, but from which he obtains no production. It is of two types.

1. Normal Idle Time 2. Abnormal Idle Time

1. Normal Idle Time :

This represents the time, the wastages of which cannot be avoided and therefore, the employer must bear the labour cost of this time. But every effort should be made to reduce it to the lowest possible level. Following are some of the examples of normal idle time :

(i) The time taken in going from the factory gate to the department in which the worker is to work, and then again the time taken in coming from the department to the factory gate at the end of the day.

(ii) The time taken is picking-up the work for the day.

(iii) The time, which elapses between the completion of one job and the commencement of the next job.

(iv) The time taken for personal needs and tea breaks.

(v) The time lost when production is interrupted for machine maintenance.

Treatment of the Cost of Normal Idle Time :

It is unavoidable cost and as such should be included in cost of production. The cost of normal idle time can be dealt within one of the following ways :

(i) **Normal Idle Time cost as a Factory Cost :** The labour cost of normal idle time may be treated as an item of factory expense and recorded as an indirect charge. For example, if a worker is engaged for 8 hours in a factory @ Rs. 10 per hour, he will received Rs. 80 as wages for the day. From past records it is found that he utilizes only 7 hours for actual production. In such a case Rs. 10 the labour cost of one hour of normal idle time may be debited to factory expenses as a direct expenditure and charged as wages to the production.

(ii) **Normal Idle Time Cost as a Production Cost :** In second method, the labour cost may be charged direct to production at a grossed-up rate to include normal idle time. In the above example, Rs. 80 i.e. total wages will be charged to the production as a direct charge under the heading of direct wages. The gross up rate will be Rs. 11.40 per hours (Rs. 80/7).

The second method of treatment of the cost of normal idle time is preferable due to the following reasons :

(1) The actual cost of engaging the worker is Rs. 80 (in the above example) and therefore, the jobs upon which he has spent his time should bear the entire amount of wages proportionately. No portion of the labour cost should be treated as factory expenditure.

(2) It will lead to approximately of cost if the labour cost of the normal idle time is treated as a factory expenditure because greater accuracy is achieved in costing if as much expenditure as possible can be direct expenditure.

It is that time the wastage of which can be avoided if proper precautions are taken. Example of abnormal idle time can be cited as follows :

(i) Time wasted due to breakdown of machinery on account of the inefficiency of the works engineers.

(ii) The time wasted on account of the failure of the power supply.

(iii) The time wasted due to shortage of materials on account of the inefficiency of the store-keeper of the purchasing department.

(iv) The time wasted due to strikes or lock-outs in the factory.

Treatment of the Cost of Abnormal Idle Time :

In costing all abnormal expenses and losses should be included in as such wages paid for abnormal idle time do not form part of the cost of production. The wages

paid for abnormal idle time should be debited to Costing Profit and Loss Account. Idle time cards should be prepared to know the reasons which are responsible for such a time. Production should be planned and supervised so that idle time is reduced to a minimum.

It will be recognized that idle time can be isolated only in case of direct worker. In case of indirect or non-productive workers i.e. fitters and watch and ward staff, the whole of their wages will be shown as indirect expenses and so wages for idle time will be absorbed automatically.

Overtime :

If a worker works for more than the fixed factory hours he is treated to be engaged in overtime and is given wages at double the basic hourly rates for the overtime put in by him. The calculation of wages due to a worker is made either at single rate up to fixed factory hours in a day and a double rate over that time to give incentive for overtime. The additional amount paid on account of overtime is known as overtime premium. As a principle, overtime should not be resorted to because of increase in the cost of production because overtime is paid at a higher rate and comes in when fatigue has set in and worker's efficiency will not be much as it was during normal time. Moreover, workers will adopt the habit of postponing the work to be done in overtime just to earn more wages. Expenses like lighting, cost of supervision, wear and tear of machinery etc. will increase disproportionately.

Treatment of overtime premium :

The normal wages paid form a part of direct cost or indirect labour cost depending upon whether labour is direct or indirect while there is controversy as regards treatment of overtime premium. It is sometimes said that it is not reasonable to charge a particular job with overtime premium merely because it was done in overtime. To do away with this inequity, normal wages are grossed up to allow for overtime premium and therefore, each job, whether done in normal time or overtime is charged at the same rate of wages. This method of treatment ofovertime premium is suitable when the sequence of jobs is a matter almost of chance, but if overtime is needed in case of a rush job at customer request so as to complete it within a particular time, it is proper to charge the overtime premium to the cost of the rush job. Where, however, overtime arises due to any abnormal reason such as breakdown of machinery or failure of power, overtime premium is excluded from the cost of production and is debited to the Costing Profit and Loss Account.

ILLUSTRATION I: Calculate the normal and overtime wages payable to a workman from the following data :

Days	Hours Worked
Monday	8 hrs.
Tuesday	10 hrs.
Wednesday	9 hrs.
Thursday	11 hrs.
Friday	9 hrs.
Saturday	4 hrs.
Total	51 hrs.

Normal working hours = 8 hrs. per day.

Normal rate = Rs. 10 per hour.

Overtime rate = upto 9 hours in a day at single rate and over 9 hours in a day at double rate ; or upto 48 hours in a week at single rate and over 48 hours at double rate whichever is more beneficial to the workmen.

Solution :

Days	Total hours Worked	Normal worked Hours	Overtime Hourse At single	Overtime Hourse At double
Monday	8	8	-	-
Tuesday	10	8	1	1
Wednesday	9	8	1	-
Thursday	11	8	1	2
Friday	9	8	1	-
Saturday	4	8	-	-
Total	51	44	4	3

Normal wages for 44 hours @ Rs. 10	= Rs. 440
Overtime Wages:	
At single rate for 4 hours @ Rs. 10	= Rs. 40
At double rate for 3 hours @ Rs. 20	= Rs. 60
Total Wages	= Rs. 540

OR

Normal wages for 48 hours @ Rs. 10 per hr.	= Rs. 480
Overtime wages for 3 hours @ Rs. 20 per hr.	= Rs. 60
Total Wages	= Rs. 540

Out workers :

Sometimes, certain portions of work are performed by workers at their own premises. Such workers take materials from the factory and make finished articles at their own

premises with their own tools. In such cases, time records are not required because payment to such workers is made on the basis of output and time spent by these workers is not important. But rigid control must be exercised over these workers in the following matters :

(a) All the materials drawn from the stores are accounted for.

(b) Quality of the finished goods should be checked and defective goods should be rejected. Fines should also be imposed for the defective work.

(c) The delivery of output should be within the time stipulated to ensure even flow of production and the fulfillment of orders of customers.

The wages of outworkers should be fixed at a higher rate than those paid to price-workers working in the factory, as some compensation must be paid to them for the use of their premises, tools, lighting etc.

Workers who are sent to building sites or customer's premises to perform their work are also known as outworkers. The records for such workers must be maintained so that workers may not waste the time and take reasonable time to perform their duties at the customer's premises. Where a larger number of workers are engaged upon a site for a long period, time recording clocks should be installed to record the time of direct workers.

Casual Workers :

Every business house keeps a regular labour force to meet its requirement but sometimes, due to extra work, additional workers have to be employed for a few days or hours. Such workers are known as casual workers, these workers are paid or as soon as the work is complete. Wages paid to such workers are treated as factory expenses if the time spent by them can be identified with specific jobs, the wages paid to them are treated as a direct charge and debited to the jobs for which the time is spent. Strict control should be exercised by the management over the employment if these workers because their employment is one source of fraud. Time-keepers of foremen may show bogus names as those of casual workers and misappropriate the wages themselves. A higher level officer should authorise for the employment of the casual workers, and foremen should not be given the permission to employ these workers. Surprise checks should be made to see that number of workers actually employed agrees with the number of those workers shown in the wages sheet.

2.1.3.5 Pay Roll Department

While performing controlling and accounting activities the pay roll department maintains a record of the classification of job, department and wage rate for each worker, verifies and summaries the timer of each worker as shown on the time card to calculate the wages due to each worker. It prepares the pay roll of wage sheet for each department to maintain a permanent pay roll record for each employee.

Preparation of Pay Rolls or Wages Sheet :

Pay roll or wages sheet discloses the wages due to each worker. Time cards form the basis for the preparation of pay rolls when wages are paid on the basis of time. On the other hand, piece work card form the basis for the preparation of pay roll when wages are paid on the piece base. Separate pay roll is prepared for each department to serve the following purposes :

(i) The volume of work to be done in connection with the preparation of wages sheets is spread over. In many organizations, the preparation of payroll and the payment of wages are so planned that one department may close its week on Monday and workers may be paid on Wednesday, and so on throughout the week so that there is an even flow of payroll work throughout the week.

(ii) The labour rate can be calculated for each department.

(iii) The actual wages of department can be compared with the budgeted wages so as to point out the inefficiency of the department if the actual wages exceed the budgeted wages.

2.1.3.6 Cost Accounting Department

This departments works for the accumulation and classification of all labour costs. This department uses the time card, job card and payrolls for the calculation of the labour cost of various jobs, work orders, processes etc.

Wages Analysis Sheet or Wages Abstract :

The cost accounting department prepare the wages abstract in order to determine the direct labour costs, indirect labour costs, departmental labour costs and differences between the budgeted labour cost and the actual labour costs and to inform the management of the effectiveness of its labour policies. The wages abstract is like a material abstract and it is prepared with the help of time cards, job cards and wages sheets. This abstract can be prepared for a week.

Accounting Entries :

Individual job accounts are debited to the wages abstract and the total amount charged to various jobs is debited to work in progress account. The amount of wages which cannot be conveniently apportioned to jobs is debited to overheads. Wages paid for normal idle time are debited to overheads or charged proportionately to jobs and wages paid for abnormal idle time are debited to Costing Profit and Loss Account.

(1) On payment of wages the entry is :

Wages Control Account Dr.
To Cost Ledger Control Account

Bank or cash account is not credited because-, cost ledger has nothing to do with handling of cash. Therefore, Cost Ledger Control Account is credited in place of Cash Account.

(2) Work in Progress Control Account Dr.
To Wages Control Account

Wages Rates for Costing Purpose :

As explained earlier, labour costs represent not only basic wages, but also a number of other expenses such as dearness allowance, employee's contribution fund and ESI scheme, production bonus, profit bonus, holiday pay etc. Such expenses may be included in overheads, but it is better if these expenses are treated as direct expenses All these expenses are added to the basic wages and then divide the total by the effective hours worked. The resulting figure will be the labour cost per hour and a job should be charged with the amount which is arrived at by multiplying the hours worked with such a figure.

2.1.4 SELF CHECK EXERCISE

Ques.1. Find out the labour cost per hour if a worker is paid Rs. 200 per month in addition to D.A. of Rs. 50 per month. He is entitled to get bonus @ 10% on wages. Employers contribution towards ESI scheme in 1/2%. Employer's contribution is 8-12% of wages towards contributory provident fund and 1% towards ESI scheme. The worker is entitled contributory provident fund and 1% towards ESI scheme. The worker is entitled to have on full pay for 1/20 of days worked. The employer maintains canteen where subsidised tea and lunch are provided to workers and a monthly subsidy of Rs. 1,000 is provided to the canteen. The total number of employee who take advantage of this canteen is 200. Normal idle time amounts to 20%. The average working days in a month are 25 of 8 hours each.

Ques.2 What do you mean by monetary Benefits ?

2.1.5 Summary

Labour cost, representing the human contribution in production is an important cost factor which requires constant control, measurement and analysis. Control and accounting for labour costs constitutes one of the most important problems of management in the operation of a business enterprise and in determination of the cost of manufacturing a product or to render a service.

2.1.6 GLOSSARY

1. Idle Time - Unproductive time
2. Outworkers - Workers performing work at their premises
3. Normal idle time - Wastage of time which can't be avoided
4. Abnormal idle time - Wastage of time which can be avoided
5. Motion Study - Study of movements of the worker

2.1.7 ANSWERS TO SELF CHECK QUESTIONS

Ans.1. Total expenses incurred per month:

Wages = 200.00 per month

Dearness Allowance = 50.00 per month

Bonus @ 10% of wages = 20.00

Contribution towards Contributory Provident Fund @ 8.5% of wages $= \frac{(200 \times 10)}{100} = 16.67$

Contribution of ESI scheme (200x) = 2

	$\frac{(200x25)}{3x100}$	
Proportion of Canteen's Subsidy	$\frac{1}{100}$	= 5.00
Total [200+50+20+16.67+2+5]		= 293.67
Number of Working Hours :	$\left(\frac{1000}{200}\right)$	
Working days in a month		= 25
Working hours in a day		= 8
Total working hours in a month (25x8)		= 200
Less 1/20 for leave {(200x1/20)=10}		= 10
Less 20% for Normal Idle Time		= 38
Effective Hours in a month	$\frac{(190x20)}{100}$	= 152
Total expenses per month (as calculated above)		= 293.67
Therefore, Labour Cost per Hour 293.67/152		= Rs. 1.93

Ans.2. Monetary benefits can include :

1. Basic Wages
2. D.A. (Dearness Allowance)
3. Employer's Contribution to Provident fund
4. Employer's Contribution to Employee's State Insurance (ESI) Scheme
5. Production Bonus
6. Old age Pension
7. Profit bonus
8. Retirement Gratuity etc.

2.1.8 EXERCISE

(A) Short Questions :

1. Distinguish between direct and Indirect labour.
2. What is Idle time? What are its causes?
3. What is overtime? How does it treated in cost accounting?

(B) Long Questions :

Q.1. Define labour turnover and explains the causes of labour turnover.

Q.2. What are the essential characteristics of a good system of wage payment? Describe the time rate and piece rate systems of wage payment.

Q.3. Compute the earnings of A and B from the following particulars for a month and allocate the labour cost to each job X, Y and Z :

	A	B
Basic Wages	Rs. 100	Rs. 160
D.A.	50%	50 %
Contribution to P.F. (On Basic Wages)	8 %	8%
Contribution to E.S.I. (On Basic Wages)	2 %	2 %
Overtime (for completion job Y)	10 hrs.	--

The normal working hours for the month is 200. Overtime is paid at double the total of normal wages and D.A. Employer and employees have equal contribution to P.F. and E.S.I. The two workers were employed on jobs X, Y and Z in the following jobs proportions:

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

2.1.9 SUGGESTED READINGS

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COST ACCOUNTING

LESSON NO. 2.2 AUTHOR : DR. J.S. PASRICHA

METHODS OF WAGE PAYMENT AND INCENTIVE PLANS

STRUCTURE OF THE LESSON

2.2.0 OBJECTIVE

The main objectives of this lesson is to introduce the students with (1) Features and nature of Good wage system; (2) Main methods of Wage payment system; (3) Various incentive Plans; and (4) causes, effects and cost of labour turnover.

2.2.1 INTRODUCTION

The method of wage payment should be such which reduces labour cost per unit and at the same time workers should be paid reasonable amount for their work. Low wages do not necessarily mean low cost of production. On the other hand high wages may lead to low cost of production where high wages give incentive to workers to become efficient and produce more. Increased production will lead to lower labour cost per unit. High wages will help in recruiting the most suitable workers. There will be less loss of production due to less labour turnover. The labour force will remain satisfied

with high wages and will not like to leave the factory. Increase in production will further lead to lower fixed cost per unit. Thus cost of production per unit will come down.

2.2.2 ESSENTIAL FEATURES OF GOOD WAGE SYSTEM

A wage system will be considered fair if it is fair to both, to the employer and the employee. It should be based on scientific time and motion study to ensure a standard output to the employee and a fair amount of wages to the workers. The worker should be assured of a guaranteed minimum wage at a satisfactory level irrespective of the work done by him. Payment under such a system are on the basis of merit and the efficient workers should be able to earn more wage as compared to the inefficient workers. Skilled workers should be paid more as compared to the unskilled workers. The system should ensure equal pay for equal work and it should be flexible to allow necessary changes which may arise. It must not violate any local or national trade union's agreements. The system also keep in view 'The wage rate in the same area of industry.

2.2.3 METHODS OF WAGE PAYMENTS

There-are two principal methods of wage system : (i) Time wage system and (ii) Piece rate system. Under time wage system payment is made on the basis of work done irrespective of the time taken by the workers. And under the system of piece rate system, a fixed rate is paid for each unit produced, job performed or on operation performed.

2.2.3.1 Time Wage system

Under this system the worker is paid at an hourly, daily, weekly or monthly rate. Suppose a worker is paid at the rate of Rs. 1 per hours and he has spent 320 hours by rate. Hence payment is made according to the time actually worked irrespective of the quantity of work done. This system is prevalent in those industries where quality of the foods produce is of extreme importance e.g. artistic goods and where speed of production is beyond the control or energy of the worker. This method is easy and very simple to follow, but is suffer form a few disadvantages.

Advantages:

1. Under this system the workers are not paid according to their merits because no distinction is made between efficient and inefficient workers. Payment is made according to the time spent and not according to the output of the workers. As a result this method gives no incentive to produce more. Workers will also get payment for the idle time.
2. Efficient workers will become inefficient workers because they notice that inefficient workers also get the same wages.
3. It is not possible for the employer to ascertain the exact labour cost per unit because it will charge if output falls or rise. Therefore, a difficulty is experienced

while sending quotations for tenders.

4. Strict supervision is necessary to get the required amount of work done from the workers.

2.2.3.2 Piece Rate System

Under the system of wage payment, the payment is made according to the quantity of work done and no consideration is given to the time taken by the worker to perform the work. For instance, a worker is paid at the rate of Rs. 2 per unit and produced 10 units during the day, he will get Rs. 20 (unit produced x rate per unit).

Under piece rate system an equitable piece work rate should be maintained for the workers to produce more. Equitable rates can be fixed with the help of time and motion study and job analysis. Although time spent by piece workers is not important, it is desirable that time cards should be maintained for those workers who come late or leave early. Time cards may be introduced to maintain discipline. Such cards are to be maintained if the workers are guaranteed a minimum payment for the time spent by them irrespective of their output. It also required when dearness allowance is to be paid to piece rate worker on the basis of time spent by them in addition to a fixed rate per unit produced.

Advantages :

1. Workers are paid according to their merit because distinction is made between efficient and inefficient workers. An efficient worker can earn more wages because wages are linked to output. Hence, this method is an improvement over the time wage system.
2. An inducement is given to the workers to increase their production and as a result worker will try to adopt better methods of production to increase their production to earn more wages.
3. Increased production will reduce fixed expenses per unit and cost of production will reduce, allowing a greater margin of profit to the employer.
4. The employer is able to know his exact labour cost per unit which will help in making quotation confidently.
5. Idle time is not paid for as is the case under the time wage system. Thus, idle time will be reduced to minimum.
6. Workers use their tools and machinery with a greater care so that the production may not be held up on account of their defective tools and machinery.

Disadvantages :

1. While fixing suitable rate of work, considerable difficulty is faced. Low piece work rate is fixed by the employer will frustrate the worker and will not provide any inducement to the workers to increase the production. Thus, equitable

piece work rates should be fixed if the piece rate system is to be successfule.

2. The quality of the output will suffer as workers will try to produce more to earn more wages. Strict supervision and inspection is necessary to ensure the quality of the produced.
3. There may not be an effective use of materials, due to efforts of the workers to increase the production.
4. Increased production does not mean lower cost of production. Cost of production may increase due to more wastage or material, higher cost of supervision and inspection and high tools cost.
5. Increased production will not reduce the labour cost per unit because the same rate will be paid for all units. On the other hand, increased production will reduce the labour cost per unit under the time wage system.
6. Workers have the fear of losing wages, if they are not able to work due to some reason.
7. Workers may work for long hours to earn more wages and thus, may spoil their health.
8. Workers may work at a furious speed for a few days, earn good wages than absenting themselves for a few days, upsetting the uniform flow of production.
9. Workers in the habit of turning out quality. Good will suffer because they will not get any extra remuneration for the good quality.
10. The system will cause discontent among the slower workers because they are not able to earn more wages.

Applicability of Piece Rate System

The piece rate system is also known as payment by result system and it can be successfully applied when the following criteria is met :

(i) The work is of repetitive type.
(ii) Quantity of output can be measured.
(iii) Quality of goods can be controlled.
(iv) It is possible to fix an equitable and acceptable piece rate.
(v) Materials, tools and machineries are sufficiently available to cope with the possible increase in production.
(vi) Time cards are maintained to make workers punctual and regular so that production may not slow down.

2.2.4 INCENTIVE PLANS

The main objective of all incentive plans is to increase the production by giving an inducement to the workers in the form of higher wages for less time worked. The following incentive plans are used by present day management in one form or the other.

1. Premium and Bonus Plans.
2. Co-partnership and Profit Sharing Schemes.
3. Incentive schemes to Indirect Labour.
4. Overtime.

2.2.4.1 Premium and Bonus Plans :

Under this plan a standard time is fixed for the completion of a specific job or operation and the worker is paid for the time taken by him to complete the job or operation at any hourly rate plus wages for a certain fraction for the time saved on the standard by way of a bonus. It is to be recalled that standard time is the time taken by the average worker and this time is determined on the basis of time and motion study, in this plan the worker has the incentive to earn more wages by completing the work in less time. For example, if a worker is allowed 10 hours to complete the job and he is given bonus at the rate of 50% of time saved, he takes 6 hours to complete the job. In this case he will get wages for 8 hours i.e. wages for 6 hours (Actual time taken) plus wages for 2 hours (50% of time saved) as bonus.

This system of wage payment is in between the time wage system and piece work system. In this system the worker gets full payment for the time saved; whereas in a premium plan, both the worker and the employer share the labour cost of the time saved. In the above cited example, the worker will get wage (i) for 6 hours in time wage system (ii) for 10 hours in piece work system, and (iii) for 8 hours in premium plan. Thus in premium plan, the employer is able to save wages for a proportion of the time saved and on the other hand worker is able to get extra wages for a fraction of the time saved.

A desirable premium plan should take into consideration the following points:

1. The plan should be simple and it should be easy to understand by all workers.
2. The plan should appear reasonable both to the employer and the employee.
3. Standard time should be determined on the basis of time and motion study. An average worker should be able to complete the work within the allowed time.
4. Standards should be such that once fixed should not be altered unless there is a permanent charge in the method of work.
5. The system should result in increased production and lower cost of Production. The two important premium plans are :
   (a) Halsey Premium Plan
   (b) Rowan Premium Plan

(A) Halsey Premium Plan : Under this plan, standard time for doing each job or operation is fixed and the worker is given wages for the actual time he takes to complete the job or operation at the agreed rate per hour plus a bonus equal to (usually) one

half of the wages of the time saved. In practice, the bonus may vary from 33-1/3% to 66-1/3% of the wages of the time saved. Thus, S is the standard time. T the time taken, R the labour rate per hour, and % is the percentage of the wages of time saved to be given as bonus, total earning of the worker will be :

T x R + % (S-R) R

Example I :

Rate per hour = 1.50 per hour
Time allowed for a job = 20 hours
Time taken = 15 hours

Calculate the total earning of the worker, also find out effective rate of earning.

Solution :

S (Standard time) = 20 hours
T (Time taken) = 15 hours
R (Rate) = Rs. 1.50 per hour
Total Earning = T x H + 50% (S-T) x R
= 15 x 1.5 +50/100 (20-15) x 1.50
= 22.50+3.75=26.25
Time wages for 15 hours = 26.25

Therefore, effective rate of earning per hour

$$= \frac{\text{Total wages}}{\text{Actual Time Taken}} = \frac{26.25}{15} = \text{Rs. } 1.75$$

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

(B) Rowan Plan :

Under this plan the worker is guaranteed wages at the ordinary rate for the time taken by him to complete the job or operation. The difference between the Halsey Premium Plan and Rowan Premium Plan is only in the calculation of the bonus. Under the Halsey Plan, bonus is fixed percentage of the wages of the time saved whereas under the Rowan Plan, bonus is that proportion of the wages of the time taken which the time saved bears to the standard time allowed. Thus, bonus under this system will be calculated as under :

$$= \frac{S-T}{S} \times T \times R$$

Here T = Time taken (Actual time)
S = Standard Time (Time allowed)
R = Rate per unit

Both these plans are criticised by the workers on the ground that they do not get the full benefit of time saved by them as they are paid bonus for a proportion of the time saved. The Rowan Plan has another drawback that two workers, one is very efficient and other is not so efficient, may get the same bonus. Suppose, standard time fixed for a job is 20 hours, worker A finishes the job in 8 hours and worker B in 12 hours and labour rate per hours is Rs. 1.50

$$\text{Worker A's Bonus} = \frac{S-T}{S} \times T \times R = \frac{20-8}{20} \times 8 \times 1.50 = \text{Rs. } 7.20$$

$$\text{Worker B's Bonus} = \frac{S-T}{S} \times T \times R = \frac{20-12}{20} \times 12 \times 1.50 = \text{Rs. } 7.20$$

Thus the two workers get the same amount of bonus. Besides this there are so many other premium plans in existence e.g. Taylor's Differential Piece Rate System, Emerson's Efficiency Plan, Gantt's Task and Bonus Plan etc. The main object of all, those plans is to motivate the workers to save time and earn more.

Taylor's differential piece rate system : In this plan, Taylor did not give minimum guarantee to each worker. As per his statement it is possible to calculate standard workload for every worker on the basis of time and motion studies. He gave two piece rates for the workers. The lower rate for average and less efficient workers who produce less than the standard production and the higher piece rate for the above average or efficient workers. So the efficient workers are paid more than the inefficient workers.

Standard Production = 40 units in a day
Wage rate = between 60 to 70 Rs

If the worker produces 40 units in a day he will be paid 40*70 = Rs 280
If the worker produces 30 units in a day he will be paid 30*60 = Rs. 180
As only those who give standard output or more will be paid at Rs. 70 and rest will be paid at Rs. 60 only.
Thus in this method inefficient workers are penalized. Workers are treated like machines and there is no guarantee of minimum wages in this method.

(C) Group Bonus Scheme :

Under all the premium plans that we have discussed so far, bonus payment to an individual was ascertained. A bonus scheme for a group of workers can be introduced where :

1. It is necessary to have a team work.
2. It is required not only the direct worker, but also the indirect workers who assist the direct workers.
3. It is difficult to measure the output of individual workers because the output depends upon the combined efforts of a group of worker's. A group bonus is

divided among the workers of the group in proportion to the basic wages earned by them.

Advantages :

1. It creates team spirit which in turn leads to high output.
2. It eliminates excessive wastage of time because the members of the group divide the work among themselves according to their convenience keeping in view the interest of group as a whole.

Disadvantages :

The share of bonus of efficient workers may be the same as that of inefficient workers because all workers of the group get bonus in proportion to their normal time rate earnings.

Characteristics of good group bonus plan :

1. The degree of skill required for the workers of a group should not very wide.
2. The number of the members of a group should not be very large.
3. The production of a group should be independent of any other group.

2.2.4.2 Go-Partnership and Profit Sharing Schemes :

Such schemes are very popular now-a-days. Under these schemes, workers get a share of the yearly profits of the company. This is done with a view of getting the cooperation of the workers by giving them the feeling that they are to share the property of the business. Workers can be given them their share of profits in the form of cash or share in the company. A permanent interest of the workers in the future of the business is created if the share of profits is given in the form of shares in the company:

1. It is difficult to fix the percentage of profit to be given to workers. This share is usually fixed through negotiations between the employer and the workers and it is possible that they may not come to amicable settlement. If the share is not given to the satisfaction of the workers, they may resort to strikes.
2. The share of profits is given at the end of the year, the incentive to the workers is remote and he may lose interest in it. Thus, these plans arc not likely to increase the efficiency of the worker.
3. The share of profits is given to all workers, so no distinction is made between efficient and inefficient workers.
4. Most of the workers do not understand the complications of finance and accounts and so they see the accounts prepared by the management with the suspicious eyes. Their belief is that less profit is shown by the account and they are not getting reasonable share of profits.
5. The workers share profits in good years, but do not bear their share of losses in bad years. The Payment of Bonus Act has profit sharing compulsory in all industries and has laid down a minimum bonus of 8.33% of wages earned.

2.2.4.3 Incentive Schemes to Indirect Labour :

Since the efficiency of direct labour also depends on indirect labour, it is proper to give them bonus or incentive wages. But it is rather difficult to frame a sound incentive scheme for Indirect Labourers as their efficiency cannot be accurately measured. However, bonus or incentive wage may be paid to them in the following two ways :

(i) As a percentage of the average bonus earned by direct labourers whom they render service ; or

(ii) As a percentage of the total production of the department with which they are associated.

2.2.4.4 Overtime :

The excess paid over usual normal rate is called as 'overtime premium. Wages at normal time are for overtime worked are treated as direct labour cost to the production. But the additional wages requires special treatment, depending upon reasons for overtime as explained below :

(a) If overtime is required to expedite the work at the request of the customer, overtime is directly charged to that work.

(b) If it is due to increase in general pressure of work, the premium may be arises on account of overhead and charged to entire production.

(c) If it arises on account of mismanagement in a department, the premium may be included in department overheads.

(d) In case of abnormal reasons such as failure of power supply, interruption in material supply, accidents, fire etc. it should be transferred to costing profit and loss Account.

Self Check Exercise

Ques.1 List the methods of wage payment.

Ques.2. Define Group Bonus Scheme and its nature.

2.2.5 LABOUR TURNOVER

Labour turnover denotes the percentage change in the labour of an organisation. High percentage denotes that labour is not stable and there are frequent changes in the labour forces because of new workers engaged and old workers left the organisation. A high labour turnover is not desirable.

$$\frac{\text{Number of employees left during period}}{\text{Average No. of employees during a period}} \times 100$$

This definition does not take into consideration the fact of surplus labour. This definition will give incorrect result when the surplus workers are discharged because of labour turnover calculated in this way will be high.

(2) Labour Turnover according to flux method :

$$\frac{\text{Number of (Separations and number of replacement}}{\text{Average No. of employees during a period}} \times 100$$

In such a case, labour turnover as per the definition, will show half the actual percentage of labour turnover.

(3) Labour of workers according to replacement method :

$$\frac{\text{Number of employees left during period}}{\text{Average No. of employees during a period}} \times 100$$

This definition takes into account the surplus labour. This definition will also give correct labour turnover when the factory is expanding because all additions are not to be taken, only workers replaced due to leavers are to be taken. Therefore this definition can be taken to the most reliable definition out of all the definitions given above.

Example II :

From the following information, calculate the labour turnover rate and labour flux rate:

No. of workers at the beginning of the year = 3,800

No. of workers at the end of the year = 4,200

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

Solution

Average no. of workers during the year

Labour Turnover Rate :

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

$$\frac{\text{No. of workers replaced during the year}}{\text{Average no. of workers during the year}} \times 100 = \frac{150 \times 100}{4,000} = 3.75\%$$

$$\text{Labour Flux Rate} = \frac{\text{No. of replacement + No. of Separation}}{\text{Average No. of employeer during the month}} \times 100$$

$$= \frac{200+150}{4000} \times 100 = 8.75$$

Example III:

Following information relates to a company work force. For the month of March, 2015: Labour Force at the beginning of the month, 2000, and at the end of the month 2,200. During the month, 50 persons were discharged while 50 persons left the company. 300 workers were engaged, out of which only 30 persons were appointed to vacancies created by the separated workers and the rest on account of an expansion scheme. Calculate the labour turnover rate and equivalent annual rate under then different methods.

Solution :

Average Number of workers = $\frac{2000+2200}{2}$ x 2100

(a) Separation Method = $\frac{\text{No. of employees left during the month}}{\text{Average No. of employees during the month}} \times 100$

$\frac{100}{2100}$ x 100 = 4.76%

Equivalent annual rate = $\frac{4.76}{30}$ x 365 = 57.91%

(b) Labour Turnover According to Flux method :

$= \frac{\text{No. of separation + No. of replacements}}{\text{Average No. of employees during the period}} \times 100$

$= \frac{100+30}{2100} \times 100 = 6.19\%$

Equivalent Annual Rate = $\frac{6.19}{30} \times 365 = 75.31\%$

(c) Replacement Method

$= \frac{\text{No. of replacement during the month}}{\text{Average No. of workers for the month}} \times \frac{40}{100}$

$\frac{30}{2100}$ x 100 = 1.43%

Equivalent Annual Rate = $\frac{1.43}{30}$ x 365 = 17.39%

Labour flux rate denotes total change in composition of labour force due to additions and separations of workers.

2.2.5.1 Causes of Labour Turnover :

Various causes of labour turnover can be divided under two main headings (i) Avoidable causes and (ii) Unavoidable causes.

Avoidable causes include the following :

(i) Low wage may include a worker to leave the factory and join another factory where higher wages are paid.

(ii) Bad working conditions e.g. bad environment, inadequate ventilation etc.

(iii) Unfair hours of work.

(iv) Long hours of work.

(v) Unsympathetic attitude of the management may force the workers to leave.

(vi) Lack of proper recreational facilities.

(vii) Wrong placement of workers may lead to job dissatisfaction.

(viii) Inadequate medical and housing facilities may induce a worker to join another factory where adequate medical and housing facilities are available.

Unavoidable Causes :

(i) Workers may be discharged due to insubordination or, inefficiency.

(ii) Retirement and death lead to labour turnover.

(iii) Accident making workers permanently incapable of doing work.

(iv) Women workers may leave after their marriage in order to take up household duties.

(v) Workers may leave just because of their moving nature.

2.2.5.2 Effects of Labour Turnover :

A high labour turnover is always detrimental to the organisation. The effect of labour turnover is the increased cost of production. This may be due to the following reasons:

(a) Interruption in production leading to decreased production.

(b) Selection and training costs of new workers recruited to replace the workers who have left.

(c) Increase in cost of scrap and defective work because of inefficiency of new workers.

(d) Decrease in production due to inefficiency of new workers. New workers will take time to become efficient.

2.2.5.3 Cost of Labour Turnover :

The effect of labour turnover in the form of increased cost can be divided under two heads.

I. Preventive Costs

II. Replacement Costs

I. Preventive Costs :

These are costs which are incurred to prevent excessive labour turnover. The aim of these costs is to keep the workers satisfied so that they may not leave factory.

The costs may include :

(i) Cost of providing good conditions.

(ii) Cost of providing medical, housing and recreational facilities to workers.

(iii) Cost of providing educational facilities to the children of the worker:

(iv) Cost of providing subsidised' meals.

(v) Cost of providing other welfare facilities.

It is desirable that the preventive cost should be increased to prevent excessive labour turnover. This cost of labour turnover should be apportioned among different departments on the basis of average number of employees in each department.

II. Replacement Costs :

These costs are associated with replacement of workers and include :

(a) Cost of recruitment of new workers.

(b) Cost of training of new workers.

(c) Loss of production due to (i) interruption in production and (ii) inefficiency of new workers.

(d) Loss of profit due to loss of production.

These costs should be distributed among different departments on the basis of the actual number of workers replaced in each department.

2.2.6 SUMMARY

The method of wage payment should be such which reduces labour cost per unit and at the same time workers should be paid reasonable amount for their work. Low wages do not necessarily mean low cost of production. On the other hand high wages may lead to low cost of production where high wages give incentive to workers to become efficient and produce more. Increased production will lead to lower labour cost per unit. High wages will help in recruiting the most suitable workers. There will be less loss of production due to less labour turnover.

2.2.7 GLOSSARY

1.	Labour turnover	:	Percentage change in the labour
2.	Overtime Premium	:	Excess payment over usual normal rate
3.	Co-partnership	:	Workers share in profit of the company
4.	Time wage system	:	Hourly, Daily, Weekly or Monthly rate
5.	Piece wage system	:	A fixed rate for each unit

2.2.8 ANSWERS TO SELF CHECK QUESTION

Ans.1. Following are the methods of wage Payment ;

1. Time wage System
2. Piece Rate System
3. Incentive Plans.

Ans.2. Group Bonus is a scheme of giving bonus for the combined efforts made by group of workers. Nature of Group bonus scheme can be explainer by highlighting the following things :

1. Reasonable number of workers in a group is should be considered.
2. The group should be independent of any other group.
3. The degree of skill required for the workers of a group should not very wide.

2.2.9 EXERCISE

(A) Short Questions :

Q.1. Describe the factors which should be kept in mind while adopting a particular type of wage method.

Q.2. What do you understand by labour turnover? How it is measured?

Q.3. Discuss the causes of labour turnover and its effect on costs of production.

Q.4. Write notes on

1. Overtime
2. Premium and Bonus Plans

3. Replacement costs

(B) Long Questions :

Q. l. What is group incentive payment? Under what circumstances is it done? What are its merits and demerits?

Q.2. How do you calculate bonus under Rowan Plan?

Q.3. A workman whose basic rate of pay is Rs. 1 per hour is working under the 'Rowan' system of premium bonus. In addition, he gets D.A. of Rs. 20 per week of 48 hours. During one week he does the following jobs

(i) Job 101 for which 25 hrs. are allowed, he takes 20 hrs.

(ii) Job 102 for which 30 hrs. are allowed, he takes 24 hrs.

During the week, his waiting time amounts to 4 hrs. Find the worker's earnings and the amounts to be charge to each job and to overhead.

2.2.10 SUGGESTED READINGS

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COST ACCOUNTING

LESSON NO. 2.3 AUTHOR : SURJIT SINGH

OVERHEAD COSTS

STRUCTURE OF THE LESSON

2.3.0 OBJECTIVE

The main objective of this lesson is to provide the students detailed information about the (a) Classification of Overheads, and

(b) Codification of Overheads.

2.3.1 INTRODUCTION

Total cost may be divided into two portions like direct cost and indirect cost. The total of all direct costs (.e. direct materials, direct wages and direct expenses) is termed as Prime Cost and total of all indirect costs (i.e. indirect materials, indirect wages and indirect expenses etc.) is known as overheads. Indirect cost cannot be conveniently identified with a particular costs centre or cost unit but it can be apportioned to or absorbed by cost centre or cost units. Blocker and Weltmer defined, “Overhead costs are the operating costs of a business enterprise which cannot be traced directly to a particular unit of output.”

In the words of Wheldon, “Overhead may be defined as the cost of indirect materials, 32

indirect labour and such other expenses, including services as cannot conveniently be charged direct to specific cost units. Alternatively, overheads are all expenses other than direct expenses."

2.3.2 CLASSIFICATION OF OVERHEADS

The Various categories of overheads are

(a) Functional Classification

(b) Behavioural Classification

(c) Element-wise Classification

2.3.2.1 Functional Classification of Overhead

On the basis of functional classification the main groups of overheads are as given below:

(i) Manufacturing or Production Overheads

Indirect expenditure incurred in connection with production operation are called manufacturing or production or works overhead. Examples of such expenses are repair and maintenance of fixed assets, lubricants, consumable stores, Depreciation and insurance charges on Machinery, Electricity charges, Rent rates and taxes on works, postage and telegrams, telephone charges etc.

(ii) Administrative Overheads

All expenses incurred in the direction, control and administration of an organization which is not related to production are treated as administrative overheads. Secretarial accounting and financial control expenses are also included in administrative overheads. For example, general management expenses, salaries, Audit fees, legal charges, rent and lighting expenses of office, salaries of office staff, telephone bill of office etc. are administrative overheads.

(iii) Selling Overheads

It is the cost of seeking to create the stimulate demand of securing orders. It refers to those indirect costs which are associated with marketing and selling activities. Examples are advertising, salemen's salaries and commissions, showroom expenses, travelling expenses, bad debts, catalogues price lists etc.

(iv) Distribution Overheads :

It comprises all expenditures incurred from the time of production is completed in the factory and it reaches its destination or customer. It includes warehouse rent, expenses of delivery van and trucks, packing cost, cost of goods damaged in transits etc.

(v) Research and Development Expenses :

Research and development expenses are the cost of searching for new and improved product. Development of the old product, finding new methods of doing the work etc.

2.3.2.2 Behavioural Classification of Overheads

Different overheads costs behave in different ways when volume of production changes. Some expenses vary directly with the rise and fall in output. Some remain constant inspite of change in the levels of activity, whereas there are some other expenses which are constant upto certain level and after that they become variable. So on the basis of behaviour, overhead may be classified into (a) Fixed overhead (b) Variable overhead and (c) Semi-Variable overhead.

(a) Fixed Overhead :

These overheads remain fixed in total amount with increase or decrease in the volume of output. Examples of such expenses are salaries, building depreciation, postage, stationery, rent, rates and taxes, legal expenses etc. Fixed expenses have to incure during a particular time period. It is irrelevent whether there is more or less production. But one thing must be taken into mind that fixed cost remain fixed upto a particular level. If the company increases its plant capacity, then it has to go in for additional equipments and building and for appointing some more staff to meet the changed requirement of production which means burden of more expenses. So fixed expenses remain constant upto the plan capacity after that if any change in plant capacity takes place, company has to incur more fixed expense.

(b) Variable Overhead :

It is a cost which in aggregate, tends to vary in direct proportion to change in the volume of output. Variable overhead per unit remain fixed with the change in production. Examples are indirect materials, indirect labour, saleman's commission, power, light, fuel etc.

(c) Semi-Variable Overhead :

This overhead is partly fixed and partly variable. Such costs vary in part with the volume of production and in part they are constant, whatever, be the volume of production. Examples are commission of salemen as they are entitled to fixed salary plus commission beyond a level of sales. Similarly, Telephone expenses include fixed proportion of annual charges plus variable charges according to calls, so they are semi-variables.

Importance of Classification of Costs into Fixed and Variable :

(1) Framing the Budget :

This classification helps in framing budget for various levels of capacity utilization. In flexible budgets fixed costs remain constant while variable costs varies according to the actual output.

(2) Helpful in Decision Making :

As most problems of decision making relate to change in volume, so this classification acquires a special importance in managerial decision making. This is so because

fixed and variable costs behave in different ways when volume of output changes.

(3) Controlling of Costs :

From control point of view cost may be controllable and uncontrollable, fixed costs remain constant so these are uncontrollable, but variable costs are controllable. So this classification helps in controlling the variable costs if they are more than budgeted costs.

(4) Marginal Costs and Break Even Analysis :

This technique is totally dependent on segregation of cost into fixed and variable, thus, classification of cost is required.

(5) Absorption of Overhead :

By classifying cost into fixed and variable costs, separate rates of absorption of overhead may be used for the under absorption or over absorption arising out it. Two types of overheads are different in nature and need of different managerial action.

(6) Fixation of Selling Price :

To face competition, different prices are charged by the companies in different market, segregation of fixed and variable overheads are helpful, in fixing minimum price to be charged in a particular market. If the selling price in a particular market does not cover the variable overheads, it is better not to sell goods in that market. Minimum price can be charged in market but it should cover atleast prime cost and variable overheads. The corresponding fixed overhead may or may not be recovered. Such fixed overheads may be recovered from sales in more favourable markets.

2.3.2.3 Elementwise Classification of Overheads

According to this classification, we can divide the total expenses into :

(i) Indirect Materials
(ii) Indirect Labour
(iii) Indirect Expenses

(i) Indirect Materials

It refers to those materials which do not generally form a part of the finished product. Examples are lubricants, cotton wastes, spares and the materials which do not have much cost.

(ii) Indirect Labour

The wages of that labour which cannot be allocated but which can be apportioned to or absorbed by cost centres or cost units is known as indirect labour.

Examples of indirect labour are departmental coolies, men employed in service departments, payment to trainees, expenses of security staff and time officer etc.

(iii) Indirect Expenses :

Those expenses which cannot be allocated but which can be apportioned to or absorbed by cost centre. Examples are canteen expenses, electricity bill, Rent, Rate and Taxes, Telephone expenses etc.

2.3.2.4 Classification according to Nature of Expenses

This classification is done through standing order numbers or syllabus of work order numbers and cost account numbers. It must be clear that :

1. Standing order numbers are conventionally applied to factory overheads;
2. Cost accounting members are customarily applied to administration, selling and distribution and research development expenses.

The compilation of numbers is similar in both types of numbers. These numbers are so called as they are listed on a permanent type of schedule or manual. There is a positive need for having separate standing order numbers for fixed and variable overheads. Thus, there are two rates for fixed and variable overheads. Each standing order number denotes particular type of expenditure so that items of expenses of similar nature upon incurred are suitably classified is one of these. A large variety or number of types of expenditure in a factory will have large number of standing orders, and the-extent of control necessary.

2.3.3 CODIFICATION OF OVERHEADS

After the overheads are classified, it is useful to allot a number or symbol to each group of expenses so that each group is easily distinguished from others. Such number of symbols are codes for overheads and are called standing order number. Each standing order number denotes a particular type of expenditure. Codification is desired for to have analysis of overhead expenses for control purposes and to reduce the task of maintaining a huge number of accounts.

2.3.3.1 Objectives of Codification

The main objectives of codification of overheads are :

1. To group items of overheads of similar nature as these may be apportioned using same basis.
2 To facilitate -allocation and apportionment of overheads to different departments or cost centres.
3. To have analysis of overheads for central purposes.
4 To reduce the task of maintaining a huge number of accounts.
5. To help the task of machine accounting system in a large organisation.

2.3.3.2 Methods of Codification

1. Mnemonic methods :

Under this method, symbols are allowed according to the name of the item like:

RE - for Repair	AD - for Administration
RA - Rates	MA - for maintenance
	SAL - for Salaries

2. Decimal methods :

It is numerical system in which decimals are used to make code for different items

groups etc.

Sr. No.	*Item*
0.11	Indirect materials
0.12	Coal
0.11.45	Cotton Waste

3. Serial Number System :

In this method, each type of expenditure is allowed a number in serial order Example:

Sr. No.	*Expenditure*
1.	Telephone expenditure
2,	Power Supply
3.	Plant Repair

4. The Numerical System :

Use of numbers symbolizing an account of overhead, say 007 for factory lighting, is the simplest way of the coding methods.

For example :

(1) 01 to 99 for Production Overheads
(2) 100 to 199 for Administrative overheads
(3) 200 to 299 for selling overheads
(4) 300 to 309 for Distribution of overheads.

Thus, any code number which begins with 0 refers to Production overheads and that beginning with I refers to Administrative overhead and so on.

Self Check Exercise :

Ques. 1. Explain the concept of functional classification of overheads.

Ques.2. Why codification of overheads is required ?

Classify the following items of expenses by functions and variability :

(a) Depreciation on plant
(b) Office telephone charges
(c) Salary paid to salesman
(d) Rent of finished goods warehouse
(e) Supervisory labour .
(f) General Manager's Salary
(g) Consumable Stores
(h) Commission on sales paid to salesman
(i) Factory Power
(ii) Delivery Van expenses

Solution	Item	Function basis	Variability basis
(a)	Depreciation on plant	Factory overheads	Normally semi-variable but fixed if wholly depends on efflux of time
(b)	Office telephone charges	Administrative overhead	Semi-variable
(c)	Salary paid to salesman	Selling overhead	Fixed
(d)	Rent of finished goods warehouse	Distribution overhead	Fixed
(e)	Supervisory labour	Factory overhead	Fixed
(f)	General Manager's Salary	Administrative overhead	Fixed
(g)	Consumable stores	Factory overhead	Variable
(h)	Commission on sales paid to salesman	Selling overhead	Variable
(i)	Factory Power	Factory overhead	Variable
(j)	Delivery van expenses	Distribution overhead	Variables

2.3.4 SUMMARY

Overhead is becoming an increasing important element of cost in today's environment as a result of several factors, such as increasing trend of mechanization. Plant automation and other advances in technology. Use of costly plant and machinery results in higher overhead costs because of higher amount of depreciation, repair and maintenance etc. Thus, the proportion of overhead cost in total in modern industry is appreciably high and careful planning and control of overhead costs can result in significant saving in the total cost of production.

2.3.5 GLOSSARY

(1) R & D expenses : Research and Development expenses
(2) Codification : Assigning number, symbol or code
(3) Menomic Methods : Symbols are according name
(4) Decimal Methods : Numerical system in which decimals are used for code
(5) S & D expenses : Selling and Distribution expenses

2.3.6 ANSWERS TO SELF CHECK QUESTIONS

Ans. Following are the Class of overheads as per functional base of classification:

1. Manufacturing or Production Overheads
2. Administration Overheads

3. Selling Overheads
4. Distribution Overheads
5. Research and development expenses.

Ans.2 Need of the codification of Overheads :

1. To group the items of overheads of similar nature.
2. To facilitate allocation and apportionment of overheads.
3. To have analysis of overheads.
4. To reduce the process of maintaining a huge number of accounts.
5. To help the task of machine accounting system.

2.3.7 EXERCISE

(A) Short Questions :

Q 1. Define overhead.

Q 2. Distinguish between fixed overhead and variable overhead.

Q 3. What are factory overheads? Describe their nature.

(B) Long Questions :

Q 1. What is meant by classification of overheads and why it should be attempted?

Q 2. Explain with Illustrations the following methods of codification used for allocating overheads to cost centres! accounting heads :

(i) Mnemonic Method

(ii) Numerical or Decimal Method.

Q 3. Firm X manufactures surgical goods. Its normal production 2600 units? per month at a total cost of Rs. 32,000. At full capacity it can manufacture 3,400 units per month at a total cost of Rs. 38,000. Calculate :

(a) Average cost per instrument under normal operating conditions;

(b) Average variable cost per instrument;

(c) Total fixed cost; and

(d) Average fixed cost under normal operating conditions.

Note :(a) Rs. 12.31

(b) Rs. 7.50 per instrument

(c) Rs. 12, 500

(d) Rs. 4.81 per instrument

2.3.8 SUGGESTED READINGS

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OVERHEAD ACCOUNTING

STRUCTURE OF THE LESSON

2.4.0 OBJECTIVE

The main objective of this lesson is to give detailed information to the students about the

(a) Collection of Overhead

(b) Allocation and Apportionment of overhead
(c) Under Absorption, and
(d) Over-Absorption of overhead

2.4.1 INTRODUCTION

To ascertain the total cost, overhead is added to the prime cost. The overheads which cannot be specifically related to cost units, are to be apportioned to various departments and then to cost centres or production units. The following steps are involved in this procedure :

(1) Collection of overhead ;
(2) Classification and codification of overheads
(3) Allocation and apportionment of overheads ;
(4) Re-apportionment of service departments' cost to production departments;
(5) Absorption of overhead by production unit.

2.4.2 COLLECTION OF OVERHEAD

The following main sources can be used to collect information about the overhead costs :

(a) Invoice : For collection of indirect expenses like rent, insurance etc.
(b) Stores Requisitions : For collection of indirect materials
(c) Wages Analysis Sheet : For collection of indirect wage,-,
(d) Cash Book: For collection of petty expenses like postage, tea, freight etc.
(e) Subsidiary Records : For collection of those expenses which do not result in current cash outlay like depreciation accrued, insurance, interest on capital etc.

2.4.3 ALLOCATION AND APPORTIONMENT OF OVERHEAD

After overhead costs have been collected under various standing order numbers, the second step is to allocate and apportion the overheads to the various departments. This is also known as departmentalization or primary distribution of overheads.

Departmentalization of overheads is the process of the allocation and apportionment of overheads to different cost centres or departments. For smooth and efficient working, a factory is divided into a number of departments. Each department represents a division of activity of the concern such as repairs department, power department, stores department, cash departments etc.

Types of Departments :

(a) Production Department
(b) Service Department

(a) Production Department : It is a department where actual manufacturing

process is carried on. This department is engaged in converting raw materials into finished goods by performing some manual or machine operations.

(b) Service Department : Service department is not directly engaged in production, but the existence of service department is essential for smooth running of a production departments. The service departments of any concern are stores, cost office, personnel departments, Repair and Maintenance department etc.

2.4.3.1 Allocation of Overhead Expenses

Certain items of overhead costs can be directly identified with a particular department or cost centre. Allotment of such cost to departments is known as allocation. Thus allocation may be defined as "the allocation of whole items of cost to cost centres or cost units." In other words, allocation is changing to a cost centre of those overheads that results solely from the existence of that cost centre, example of direct overheads are wages paid to the workers of that particular department should be charged to that department. Similar other expenses like rent, overtime wages, electricity charges which are related to a particular department should be charged to that departments. So we can say that overheads can be allocated if the cost centres have incurred those expenses and the exact amount of expenses is known.

2.4.3.2 Apportionment of Overheads

Certain items of estimated overheads like salary of the works manager which cannot be directly allocated to the various departments and cost centres, are apportioned. Appointment implies the allotment of the corporations of items of cost to cost centres of the departments. It implies that the unallocated expenses are to be spread over the various departments or cost centres on an equitable basis. After this stage, all the overhead costs would have been either allocated or apportioned over the various departments. It is allocated to the different cost centres proportionately on some equitable basis. For example, rent can be apportioned to various departments on the ratio of the area occupied. Workers insurance can be apportioned on basis of Direct Wages. Kilowatt hours can be used for the apportionment of power expenses.

2.4.3.3 Principles of Apportionment

of overheads to various production and service departments is based on the following principles :

1. Analysis or Survey of Existing Conditions : This method is based on the theory that greater the amount of the service or benefit received by a department the larger should be the share of the cost to be borne by the department. For example, telephone expenses are apportioned by the number of extensions in each department or number of calls made by a department.

2. Ability to Pay : It is a principle of taxation which has been applied in cost

accounting as well for distributing the expenditure on the basis of income of paying department on a proportionate basis. So, in overhead distribution those departments which have the largest income may be charged the largest amount of overheads. This method may be inequitable because it penalizes the efficient and the profitable departments.

3. Efficiency Methods : Under this method, the distribution of overhead costs is made on the basis of predetermined levels of production or sales. When distribution or overhead costs is made on this basis and if the level of production exceeds the predetermined level of production the incidence of overhead cost gets reduced and the total cost per unit of production of the sales lowered. The opposite is-the effect if the assumed level is not reduced.

2.4.4 ILLUSTRATION 1: In a light engineering factory, the following particulars have been collected for three months period ended on 31 Dec. 2015. You are required to apportion the cost of various departments on most equitable basis.

The Expenses for the period were :

	Production Department			Service Department	
	A	B	C	D	E
Direct Wages	Rs. 2000	3,000	4,000	1,000	2,000
Direct Material	Rs. 1000	2,000	2,000	1,500	1,500
Staff	No. 100	150	150	50	50
Electricity	K.Wh 4,000	3,000	2,000	1,000	1,000
Light Points	Nos. 10	16	64	6	4
Asset Value	Rs. 60,000	40,000	30,000	10,000	10,000
Area Occupied	Sq. M 150	250	50	50	50

Motive Power Rs. 550, Lighting power Rs. 100, Stores overhead Rs. 400, Amenities to Staff Rs. 1500, Depreciation Rs. 15,000, Repairs and Maintenance Rs. 3000, General overheads Rs. 6,000 and Rent and Taxes Rs. 275.

Solution:

OVERHEADS DISTRIBUTION SUMMARY
For the quarter ending 31 December 2015

ITEMS	Basis of Apportiontment	Total Amount Rs.	Production Department			Service Department	
			A	B	C	D	E
1. Direct Wages		3,000				1,000	2,000
2. Direct Material		3,000				1500	1,500
3. Motive Power	Elec. in K. Wh. (4 : 3 : 2 : 1 : 1)	550	200	150	100	50	50
4. Lighting Power	Light Point (5 : 8 : 2 : 3 : 2)	100	25	40	10	15	10
5. Stores Overheads	(2 : 4 : 4 : 3 : 3) Direct Material	400	50	100	100	75	75
6. Amenities to Staff	(2 : 3 : 3 : 1 : 1) No. of Staff	1,500	300	450	450	150	150
7. Depreciation	Value of Assets (6 : 4 : 3 : 1 : 1)	15,000	6,000	4,000	3,000	1,000	1,000
8. Repairs and Maintenance	Value of Assets (6 : 4 : 3 : 1 : 1)	3,000	1,200	800	600	200	200
9. General overheads	(2 : 3 : 4 : 1 : 2) Direct Wages	6,000	1,000	1,500	2,000	500	1,000
Rent ant Taxes (3 : 5 : 1 : 1 : 1)	Area of occupied	275	75	125	25	25	25
	Total	32,825	8,850	7,165	6,285	4, 515	6,010

2.4.5 RE-APPORTIONMENT OF SERVICE DEPARTMENT COSTS : At first, expenses of all departments are compiled without making a distinction between production and service department. Then the expenses of the service departments are apportioned among the production departments on suitable basis. This is because ultimately the overheads are to be absorbed over goods produced or jobs completed in the production departments.

The reapportionment of service department expenses over the production department may be correct by using any of the following methods :

(1) Direct Re-Distribution Method.
(2) Step Method of Secondary Distribution or Non Reciprocal method.
(3) Reciprocal Service Method.

2.4.5.1 Direct Re-Distribution Methods : Service department costs under this method are apportioned over the production department only, ignoring the services rendered by one service department to another Service department. This may result into under or over charging of overheads to different departments.

2.4.5.2 Step Method of Secondary Distribution : Under this method the cost of most serviceable department is first apportioned to other service departments and production departments. The next service department is taken up and its cost apportioned and this process goes on till the cost of last service department is taken up and its cost is apportioned among production departments only.

2.4.5.3 Reciprocal Service Method : This method recognizes the fact that where two or more service departments exists they may render service to each other and therefore these interdepartmental services are to be given due weight while redistributing the expenses of the service departments.

Three methods are available for dealing with reciprocal services.

(A) Trial and error method : Under this method cost of one service department is apportioned to another Service department. The cost of another service department plus the share received from the first service department is again apportioned to first service department. This process is followed fill the amount to be apportioned becomes negligible.

(B) Repeated distribution method : This is also known as continuous distribution. Under this method service department costs are distributed to other service department in agreed proportion. And this process is continued till the figure of service dept. are too small to be further distributed.

(C) Simultaneous Equation Method : Under this method, the true cost of the service departments are ascertained first with the help of simultaneous equations; these are again redistributed to production departments on the basis of given percentage. This method is preferable and is widely used even if the number of service departments are more than two.

2.4.5.4 Base of Re-Apportionment : The service department costs are apportioned to producing departments generally on the basis of services rendered, i.e. in proportion to the benefits received by producing departments. The various bases normally used for the purpose are listed below :

Service Department	Basis
1. Maintenance and Repairs, Programs and Planning, Time-Keeping or Pay Roll Departments	Direct Labour Hours os Machine hours
2. Canteen, Recreation, Personnel Department	No. of Employees
3. Internal Transport	Weight or value of material used.
4. Purchase Department	No. of purchase orders or value of each materials of each deptt.
5. Store Keeping	No. of Requisitions or value of material used
6. Building Service	Floor Area
7. Fire Protection Service	Capital Value
8. Power	Horse Power, Wattage, Technical estimates.

2.4.5.5 Illustration II: ABC Ltd. has three production departments and four service departments. The expenses of these departments as per primary distribution are as follows :

Primary Distribution of Production Departments :

	Rs.
A	30,000
B	26,000
C	24,000
	80,000

Service Departments :

Stores	4000
Time Office	3000
Electricity	1600
Cafe	1000

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

	Dept. A	Dept. B	Dept. C
H.P. of Machines	300	300	200
No. of Workers	20	15	15
Value of store requisitions	7500	4500	3000

Apportion the cost of service departments over the production department.

2.4.6 ABSORPTION OF OVERHEAD

OVERHEAD DISTRIBUTION STATEMENT

Item of Cost as per Primary Distribution Summary	Basis of Apportionment	Total	Production Department		
			A Rs.	B Rs.	C Rs.
Cost as per primary Distribution Distribution Summary		80,000	30,000	26,000	24,000
Stores	Value of store Requisitions (5 : 3 : 2)	4000	2000	1200	800
Time Office	No. of Workers (4 : 3 : 3)	3000	1200	900	900
Electricity	H.P. of Machines (3 : 3 : 2)	1600	600	600	400
Cafe	No. of workers (4 : 3 : 3)	1000	400	300	300
Total		89,600	34,200	29,000	26,400

After allocation and apportionment the total overhead of production department are charged to various products manufactured or jobs completed in these production departments. Absorption means charging of overheads to cost units. Selection of correct method of overhead absorption is very important for pricing, policies, tenders and other managerial decisions. The following methods are used for absorption of factory overheads.

(1) Direct material Cost Percentage rate
(2) Direct Labour Cost Percentage rate
(3) Prime Cost Percentage Rate
(4) Machine Hour Rate
(5) Direct Labour Hour Rate
(6) Rate Per Unit of Output
(7) Sale Price Method

2.4.6.1 Direct Material Cost Percentage Rate : In this method, the amount Overheads to be absorbed by a cost unit determined by the cost of direct material consumed in producing it. This rate is computed by dividing the total overheads by the total of direct materials relating to all the products in the department.

$$\text{Overhead Rate} : \frac{\text{Production Overheads (Budgeted)}}{\text{Anticipated Direct materials costs}} \times 100$$

Advantages of this method

(i) Calculation of this method is simple because cost of direct materials is in records.

(ii) Where prices do not fluctuate widely and where output is uniform, this method produces fair result.

Disadvantages of this method :

(1) This method causes misleading results because material prices are often subject to fluctuations which are not accompanied by similar changes in overheads.

(2) This method is illogical because overheads are in no way related to the cost of material consumed.

(3) The skill of the workers involved and whether machines were used or not is ignored when these methods are used.

2.4.6.2 Direct Labour Cost Percentage Rate :

The overhead rate under this method is computed by dividing the factory or production overhead by direct labour cost.

$$\text{Overhead Rate} = \frac{\text{Production Overheads}}{\text{Direct Labour Cost}} \times 100$$

Advantages

(1) Time factor is given recognition even if indirectly, as higher the charges to a job for wages, the longer will have been the time spent on that job.

(2) Total expenses recovered will not differ much from the estimated figure since total wages are not likely to fluctuate much.

Disadvantages

(1) It does not provide for varying skill of workers.

(2) It does not distinguish between production of hand workers and at machine workers.

2.4.6.3 Prime Cost Percentage Rate :

This method is based on the premises that both materials and labour give rise to factory overhead and thus, the total of the two i.e. Prime Cost should be taken as the base for absorption of factory overheads.

$$\text{Overheads} = \frac{\text{Budgeted Production Overheads}}{\text{Anticipated Prime Cost (Direct material + Direct Labour Cost)}} \times 100$$

2.4.6.4 Machine Hour Rate :

By the machine hour rate method, manufacturing overhead expenses are charged to

production on the basis of number of hours machines are used on jobs or work orders.

$$\text{Machine Hour Rate} = \frac{\text{Production Overheads}}{\text{No. of machine hours}}$$

The following steps are taken for the computation of machine Hour Rate :

(i) Overheads are first apportioned to Production Department.

(ii) Overheads of the department are further apportioned to different machines or group of machines so for the purposes each machine or group of machines should be treated as a cost centre.

(iii) Specific overheads like insurance, power, depreciation etc. should be directly allocated to the machines.

(iv) The working hours of machines are estimated for the period.

2.4.6.5 Direct Labour Hour Rate :

This method is an improvement over the percentage of direct wage basis, as it fully recognise the significance of the element of the time in the incurring and absorption of manufacturing overhead expenses. This method is admirably suited to operation which do not involve any large use of machinery.

$$\text{Overhead Rate} = \frac{\text{Production Overheads}}{\text{Direct Labour Hours}}$$

2.4.6.6 Rate Per Unit of Output/Production

This is very simple method. This rate is determined by dividing the total overheads of a department by the number of units produced.

$$\text{Overhead Rate} = \frac{\text{Amount of Overheads (Budgeted)}}{\text{No. of Units}}$$

2.4.6.7 Sale Price Method :

When this method is used, actual overhead rate or predetermined overhead rate is determined by dividing the overhead to be absorbed by the sale realized or expected to realize.

$$\text{Overhead Recovery Rate} = \frac{\text{Budgeted Overhead Expenses}}{\text{Sale value of units of Production}}$$

Self Check Exercise :

Ques.1. What are the principles of Apportionment?

Ques.2. List the methods of absorption of Overhead.

2.4.7 UNDER-ABSORPTION AND OVER-ABSORPTION OF OVERHEAD

Overheads may be absorbed either on the basis of actual or predetermined rates. The pre-determined rates may represent estimated or normal costs. In either case, the amount of expenses actually incurred and the amount of overheads applied to

production will seldom be the same. If the actual expenses fall short of the amount applied, there is said to be an over-absorption of overheads and on the other side if actual expenses exceed the amount applied to production, there is a case of under-absorption. Such over or under absorption may also be termed as overhead variance, the amount of over-absorption being represented by a credit balance in the account and conversely, the amount of under-absorption by a debit balance.

As regards the treatment of such credit or debit balance, the general view is that if the balances are small they should be transferred to costing profit and loss account and the costs of individual products should not be increased or reduced as these would be representing normal costs, where, however, the difference is large and due to wrong estimation. It would be desirable to adjust the cost of products manufactured, as otherwise the cost figures would convey misleading impression. Such adjustments usually take the form of supplementary rate where there is debit balance in the overhead account. But where there is credit balance i.e. the overheads are over-absorbed then over-absorption is adjusted by a minus rate since the amount is to be deducted.

The idea of under/over-absorbed overhead can also be explained by the cost of ABCD Ltd. as given below :

	Production Units	Overheads Absorbed	Actual overheads
April 2014	10,000	33,500	30,500
May 2014	1,000	2,450	10,450

It is clear from the data that overheads are over-absorbed by Rs. 3,000 (33,500-30,500) in April 2014. The overheads are under-absorbed by Rs. 8,000 (Rs. 10,450-2,450) in May 2014.

2.4.8 LIMITATIONS OF OVERHEAD APPORTIONMENT

Cost Accountant's attempts are-limited by the following factors :

(1) Joint Cost : Costs common to two or more of departments, machine groups, or products are known as joint costs. There is not a single scientific method which entirely satisfy such kind of joint costs.

(2) Fixed Costs : The existence of fixed costs makes the task of obtaining accurate cost per unit more complicated.

(3) Conflicting Objectives : There are number of conflicts of objectives between the cost Accountant and the management. So the methods used are necessary a Compromise between these conflicting objectives.

Treatment of Special Items of Overheads :

1. Interest on Capital :

Different people have different of opinion on the question as to whether interest on capital should be included in cost or not. This is so because, whether a concern pays interest on capital or not, depends upon its method of capitalisation. This means a company raising finance by equity capital only has not to pay interest whereas a company raising finance partly through debenture has to pay interest. If interest actually paid is included in cost, companies not paying any interest will have lower cost and companies paying interest will show higher cost of production. This makes difficult the comparison of cost in different companies. Therefore, for the sake of uniformity, either interest paid should be included from cost, or alternatively, interest on the total capital employed (both equity and debenture capital) should be included in cost so that costs become comparable.

Carriage Inward :

This is directly concerned with the purchase of materials and is generally included in the cost of materials purchased, thereby treating it as a direct cost. Alternatively, it may be treated as an item of factory overhead.

Packing Expenses : This expense may be divided into three categories :

(a) Packing which is necessary for handling of the product e.g., medicines, on, other liquid products, must be packed to make them saleable. Such primary packing expenses are treated as direct material cost.

(b) Fancy packing meant to attract customers, e.g., colourful attractive wrappers of cosmetics is a form of advertisement and should be treated as selling overhead.

(c) Packing that facilitate transportation and handling of products to customers place, e.g., T.V. sets or refrigerators, should be treated as distribution overhead.

Advertisement :

Advertisement cost incurred for promoting sales is a selling overhead. When advertisement is for individual products it should be allocated to products concerned. On the other hand, when a common advertisement is for more than one product or when it is of general nature which is meant to promote the sales of all the products of the company, the cost should be apportioned on the basis of sales value of products or any other suitable basis.

Sometimes heavy advertisement expenditure is incurred in the initial years on introducing a product line, the benefit of which is derived over a number of future years. Such costs should be deferred over two or three future years during which benefit is likely to be derived. In case advertisement is of permanent nature, such costs should be capitalised and its depreciation charged to selling overhead. Certain

advertisement do not form part of the sales promotion programme, e.g., advertisement for staff recruitment, inviting tenders, notice of legal proceedings, etc. These are not selling overheads and thus should be charged to the department concerned.

Depreciation :

Depreciation is the decrease in the value of all fixed assets due to use and/or lapse of time. All fixed assets except land lose their value with their use and passage of time. The several factors that contribute in varying degrees to this decline in utility are wear and tear, lapse of time, obsolescence, etc. Accordingly, the cost of such assets is allocated to the periods, in which services are received from the assets, by a process called depreciation.

In cost accounts, depreciation is charged to the cost accounts on the following grounds :

(i) Depreciation represents a charge for usage of the capital resources.

(ii) The amount invested in the asset has to be recovered from the costs over a number of years equivalent to the life of the assets.

Expenses on Removal and Re-Creation of Machinery :

Sometimes, a machinery is shifted to a new site due to factors like change in the method of production, an addition or alternation in the factory building, change in the flow of production, etc. All costs incurred on dismantle the existing installation and its recreation is treated as production overhead as it does not add to the value of the asset. When the amount of such costs is large, it may be treated as deferred revenue expenditure and spread over a period of time, say 3 to five years. If removal is due to faulty planning or some other abnormal factor, it is charged to costing profit and loss account. When a new machinery is installed, the entire cost of installation is capitalised along with the cost of machinery.

Research and Development Costs :

Due to certain special features of research and development costs, different accounting treatments for such expenditure are required for different circumstances. Therefore, there is no general agreement regarding the treatment of such costs in cost accounts. The following are the various methods of treating these costs in cost accounts :

(a) As Revenue Expenditure :

This method is usually used when such amount is not very heavy. In such a situation, research and development costs are treated as general overhead and apportioned and absorbed accordingly.

(b) As Deferred Revenue Expenditure :

When benefits of research and development are to be derived over a period of two or three years, it is usually treated as deferred revenue expenditure and recovered over

a period of two development proves unsuccessful and does not produce any tangible results.

Bad Debts :

According to some accountants bad debts are financial losses and thus excluded from cost accounts. If, however, bad debts are included in cost, it should be treated as selling overhead and may be apportioned to various products on the basis of the credit sales of products. Abnormal amounts of bad debts, which are of exceptional nature, should be included in cost accounts.

2.4.9 ANSWERS TO SELF CHECK QUESTIONS

Ans. 1. Principles of Apportionment :

1. Analysis or survey of existing conditions
2. Ability to pay
3. Efficiency Methods

Ans. 2. Following are the methods of absorption of overheads :

1. Direct material cost percentage rate
2. Direct Labour cost percentage rate
3. Prime cost percentage rate
4. Machine hour rate
5. Direct Labour hour rate
6. Sale price method
7. Rate per unit of output

2.4.10 SUMMARY

To ascertain the total cost, overhead is added to the prime cost. The overheads which cannot be specifically related to cost units, are to be apportioned to various departments and then to cost centres or production units.

2.4.11 GLOSSARY

Invoice : For collection of indirect expenses like rent, insurance etc.

Stores Requisitions : For collection of indirect materials

Wages Analysis Sheet : For collection of indirect wage,-,

Cash Book: For collection of petty expenses like postage, tea, freight etc.

Subsidiary Records : For collection of those expenses which do not result in current cash outlay like depreciation accrued, insurance, interest on capital etc.

2.4.12 EXERCISE

(A) Short Questions :

Ques. 1. State the steps involved in overhead accounting.

Ques. 2. What is the difference between allocation and apportionment of overheads?

Ques. 3. Write notes on :

1. Joint Cost
2. Fixed Cost
3. Machine Hour Rate
4. Reciprocal Service Method

(B) Long Questions :

Ques. 1. "Explain the various basis of apportionment of overheads to departments with illustrations as to the items of expenses.

Ques. 2. Explain why predetermined overhead absorption rates are preferred to overhead absorption rates calculated from factual information after the end of a financial period.

Ques. 3. The following particulars relate to a manufacturing company which has three production departments P_1 P_2 and P_3 and two service departments S_1 and S_2.

	Departments				
Total departmental	P_1	P_2	P_3	S_I	S_2
Overheads as per	Rs.	Rs.	Rs.	Rs.	Rs.
Primary distribution	6,300	7,400	2,800	4,500	2,000

The company decided to charge the service departments cost on the basis of following percentages :

	P_I	P_2	P_3	S_1	S_2
S_1	40%	30%	20%	-	10%
S_2	30%	30%	20%	20%	-

Find the total overheads of production departments charging service departments cost to production departments on

(a) Repeated distribution and

(b) By Simultaneous equation method.

Note : P_1 = Rs. 9050

P_2 = Rs. 9650

P_3 = Rs. 4300

2.4.13 SUGGESTED READINGS

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