EXPERT

CA INTERMEDIATE - COST & MANAGEMENT ACCOUNTING

EMPLOYEE COST AND DIRECT EXPENSES

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EMPLOYEE COST AND DIRECT EXPENSES

I. INTRODUCTION

It is a significant component of cost, generally the second highest in the manufacturing concern and the highest in the service industry.

Every organisation consists of people working in it and the success of the organisation depends to a large extent upon the people (quality of persons) working in it. It is a difficult task for the management to deal with human beings, who are different in nature and hence difficult to control. Management tries to make the best use of available human resources and minimise the total labour cost.

DIRECT LABOUR: It is defined as the cost which can be identified with and allocated to cost centres or cost units. For example, all wages of labourers directly engaged in production and wages paid to workers engaged in construction site are direct wages.

INDIRECT LABOUR: It is that labour cost which is not possible and economically feasible to trace to any specific product. For example, wages and salaries to employees in Purchasing Department, Stores, Office and Time-Keeping Department, Firemen and Supervisors, Maintenance Personnel etc. are indirect labour cost.

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

EMPLOYEE (LABOUR) COST CONTROL - Employee cost control means control over the cost - incurred on employees. Control over employee costs does not imply control over the size of the wage bill; it also does not imply that wages of each employee should be kept as low as possible. The aim should be to keep the wages per unit of output as low as possible. This can only be achieved by giving employees appropriate compensation to encourage efficiency so that optimum output can be achieved in effective manner.

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

Department	Functions
1. Personnel Department	i) On receipt of employee requisition from the various departments it searches for the required skills and qualification. ii) It ensures that the persons recruited possess the requisite qualification and skills required for the job iii) Arranges proper training for the newly recruited employees and workshops for existing employees. iv) Maintains all personal and job related records of the employees. v) Evaluation of performance from time to time
2. Engineering & Work Study Department	i) Prepares plans and specifications for each job. ii) Providing training and guidance to the employees. iii) Supervises production activities. iv) Conducts time and motion studies. v) Undertakes job analysis. vi) Conducts job evaluation.
3. Time-keeping Department	Concerned with the maintenance of attendance records

IMPORTANT FACTORS FOR THE CONTROL OF EMPLOYEE COST

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

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

Efficiency

COLLECTION OF EMPLOYEE COSTS

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

(i) The amount included in the direct cost of goods produced or jobs completed;
(ii) The amount treated as indirect employee and thus included in overheads; and
(iii) The amount treated as the cost of idle time and hence loss.
(iv) The amount treated as abnormal loss/ gain and to be transferred to profit and loss account.

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

II. LABOUR RECORDS

There are two types of records maintained in case of Labour **- Time Keeping & Time Booking**

1. Time Keeping - Time keeping refers to the correct recording of the employee's attendance time.

Methods of Time - Keeping

a. Hand - written records - Attendance Register
b. Metal Disc or Token Method
c. Punch Card System
d. Bio-Metric Attendance System

Objectives of Time Keeping

- **Payroll Preparation -** Employee payrolls are prepared based on of time-keeping records e.g. attendance registers.
- **Ascertainment and Control of Labour Cost -** From payrolls, total labour cost can be ascertained. It is further classified into Direct and Indirect, in order to facilitate control.
- **Calculation of overtime -** Overtime entitlement of workers is calculated on the basis of total time spent and the excess time over and above regular working hours.
- **Calculation of Idle Time -** Difference between total time spent (as per time-keeping records) and total productive time (as per time-booking records) constitutes idle time.
- **Disciplinary purposes -** Time Keeping constitutes part of organisational procedures. This is to reflect the order and discipline prevalent in the organisation.
- **Statutory Compliance -** Registers and Records relating to time keeping are required to be maintained under Labour Laws like the Factories Act etc. This will ensure legal compliance.
- **Overhead distribution -** Production Overheads are absorbed over jobs or products using Labour hour Rate as the basis.

2. Time Booking - It refers to the recording of time spent by a worker on each job, process or operation.

Methods of Time - Booking

a. Time Card and
b. Job Card

III. TIME AND MOTION STUDY

Time Study is defined as recording and analysis of time required for a job with a view to set standard time requirements. Motion Study implies analysing the work into basic operations or motions in a job. These methods are complementary to one another. Father of these studies is **Gilbreth**, who had studied the movements required in laying bricks on a wall and reduced the number of movements from 18 to 6. He named these motions as **"THERBLIG"**.

Procedure -

a. Observation of workers to record their movements.
b. Classification of movements into: (a) Necessary and (b) Wasteful.
c. Elimination of wasteful movements and improvisation of necessary movements.
d. Provision of standard tools and equipment to workers.

e. Observation of workers and recording time taken for necessary movements.
f. Determination of average time required for the job, taking efficiency / rating factor into account.
g. Determination of Standard time = Average time + Idle Time Allowance (Contingencies, Rest etc.)
h. Addition of incentive margin, if any, to attract efficient workers.

Objectives -
a. To determine the best way of doing things by avoiding wasteful movement.
b. To reduce stress and strain in job performance.
c. To determine standard time for completion of a job.
d. To lay down norms for efficiency and performance evaluation.
e. To determine fair rate of wages based on output achievable per day.

IV. TREATMENT OF ITEMS OF LABOUR COST

i. Idle Time - The difference between the time paid for and actual (effective) time worked for is known as idle time. This can also be calculated as the difference between the time recorded as per Time Keeping Records and as per the Time Booking Records. The idle time then is analysed into Normal and Abnormal idle time.

Causes leading to Idle time -
Normal causes: The main causes, which lead to the occurrence of normal idle time are:
a. Time taken by workers to reach the production department from the main gate of factory.
b. Time lost between the finish of one job and starting of next job.
c. Time spent to overcome fatigue and tiredness.
d. Time spent to meet workers personal needs like taking lunch, tea etc.
e. Time required for set up of machinery, initial processing of materials etc.

Abnormal causes: The main causes, which lead to abnormal idle time, are:
a. Machine break-downs, power failure, non-availability of raw materials and tools, waiting time for jobs due to defective planning.
b. Conscious management policy decision to stop work for some time e.g. maintenance shut down.

Accounting Treatment:
a. Normal Idle time -
Cost of normal idle time is transferred to factory overheads account and thereby charged to Cost of Production.
b. Abnormal Idle time - Cost of abnormal idle time is transferred to Costing Profit and Loss Account.

Difference between Normal Idle time and Abnormal Idle time

	Normal Idle Time	Abnormal Idle Time
a.	It refers to the idle time inherent in every work situation. It is estimated in advance.	It refers to the idle time over and above normal idle time. Abnormal = Actual less Normal

b.	It is unavoidable and cannot be eliminated totally.	It is avoidable. It is further sub-classified into (a) Controllable and (b) non-Controllable.
c.	Cost of Normal Idle Time is treated as a regular part of cost of production. It is treated either as Direct Wages (for direct workers) or as Works Overheads (for indirect workers).	Cost of Abnormal Idle Time constitutes a loss, which should be debited to Costing Profit and Loss Account. In case it is controllable, the responsibility should be fixed on the person in default.
d.	In the long run, normal idle time may be reduced through improved technologies, methods and procedures.	Controllable Idle time should be eliminated through proper managerial action.

ii. Overtime: Time spent by labour over and above normal time is known as overtime and it is generally paid at double the normal wage rate.

Overtime wages = Normal wages + Overtime Premium.

Causes of overtime:

Overtime may arise due to any of the following reasons:

a. Genuine labour shortage, which leads to the firm being understaffed.
b. Pressure of immediate / urgent delivery by a customer.
c. Making up shortfall in production targets, due to some fault of management, or uncontrollable factors or unexpected developments.
d. Increase in production targets than budgeted, to meet rise in market demand.

Effect of overtime on productivity:

Overtime involves extra cost and the overtime premium paid to workers increases cost of production in the following ways:

a. Overtime premium paid is an extra payment in addition to the normal rate.
b. Efficiency of operator during overtime work may fall and hence output may be less than normal.
c. In order to earn more, workers may not concentrate on work during normal working hours and thus standard output during normal working hours may come down.
d. Reduced output and increased premium of overtime will bring out a overall increase in cost of production. Hence, overtime should be resorted to only when it is extremely essential.

Treatment of Overtime Premium in Cost Accounting:

Overtime premium is generally treated on the basis of the situation demanding overtime work:

Situation	Accounting Treatment of Overtime Premium
Due to genuine labour shortage	Treated as Regular Cost of Production, as Direct Labour, by inflating normal wage rate.
At customer's desire, e.g. immediate delivery etc.	Charged to the Job directly. Such amount will be suitably recovered from the customer by charging at a higher rate.
Irregular overtime to meet production requirements due to unexpected developments.	Charged to job by treating it as Factory Overheads.

Due to fault of a particular department e.g. non-availability of materials during normal time	Charged to the department in default, in order to fix responsibility and prevent recurrence.
Due to abnormal conditions e.g. strike etc.	Charged to Costing Profit and Loss Account.

Measures for controlling overtime cost:

The following procedural and administrative measures may be adopted for minimizing overtime :

a. Proper Supervision: Work done during normal hours should be monitored carefully. This will ensure that there is no spill over from normal to overtime, when the output can be achieved in regular time itself.

b. Sanction: The overtime work should have the prior sanction of the competent authority. The reasons justifying the overtime should be specified and considered acceptable.

c. Efficiency Comparison: Overtime efficiency should be compared with regular time efficiency. In case the overtime efficiency is very low, it may not be worthwhile to work overtime.

d. Periodical Reporting: Report on overtime work, output achieved, efficiency, reasons for overtime work etc. should be sent periodically to top management for review and action.

e. Restriction on overtime: Sometimes, an upper limit may be fixed on overtime for each category of workers, e.g. maximum 15 hours of overtime per month per worker.

f. Revised Standards for job performance: Sometimes, the time allowed for completion of job may be set without any specification as to normal time and overtime. For example, in software development, if the project duration is set as 12 weeks, the exact hours of work night or day need not be specified upon, as long as the work is completed within the total time allowed.

iii. Holiday and Vacation Pay: Employees are normally entitled to some paid holidays and vacation. Such payments may be included in departmental overheads.

iv. Night Shift Allowance: It is treated as part of overheads.

v. Fringe Benefits: These may be monetary benefits like sick pay, employer's contribution to provident fund, leave pay, gratuity, attendance bonus etc. These may be non monetary benefits like transportation facility, entertainment facility, free lunches, medical facilities etc. It is more appropriate to treat fringe benefits as a part of direct labour cost, but for administrative convenience they are normally treated as a part of overheads.

V. JOB EVALUATION AND MERIT RATING

Job Evaluation is the technique of analysis and assessment of jobs to determine their relative value within the firm so that a fair wage and salary structure can be established for various jobs.

Merit Rating is the comparative evaluation and analysis of the individual merits of the employees working on similar jobs.

	Job Evaluation		Merit Rating
1.	It is the process of determining relative worth of different jobs.	1.	It is the process of determining relative worth of persons in the organisation.
2.	It is carried out with an intention to design the salary and wage structure.	2.	It is carried out with an objective promotion, transfer, or appreciation of an employee.
3.	A uniform and fair wage structure is devised during job evaluation technique.	3.	It ensures fair wages to workers on the basis of their performance and merit.
4.	**Factors Considered:** 1. Analytical and Conceptual skill 2. Management and administration skill 3. Behavioural skill 4. Technical skill or physical work, etc.	4.	**Factors Considered :** 1. Experience 2. Association with the organisation 3. Productivity i.e., efficiency 4. Behaviour, sincerity, honesty, punctuality, etc. 5. Relative importance in the organisation. 6. Specialised skill, etc.

VI. LABOUR TURNOVER

It is the rate of change in the labour force during a specified period.

There are different causes for labour turnover, which can be broadly classified under the following three heads.

a. Personal Causes

➢ Change of jobs for betterment.
➢ Premature retirement due to ill health or other reasons.
➢ Domestic problems and family responsibilities.
➢ Marriage (specially in case of women).

b. Unavoidable Causes

➢ Seasonal nature of the business
➢ Shortage of raw material, power, slack market for the product etc
➢ Change in the plant location
➢ Disability, making a worker unfit for work;
➢ Disciplinary measures
➢ Death or reaching the age of retirement.

c. Avoidable Causes

➢ Dissatisfaction with job, remuneration, hours of work, working conditions, etc.
➢ Strained relationship with management, supervisors or fellow workers;
➢ Lack of training facilities and promotional avenues
➢ Lack of recreational and medical facilities;
➢ Low wages and allowances.

Effect of Labour Turnover:

It increases the cost of production in the following ways

a. Normal flow of production is disturbed.

b. Efficiency of new workers is lesser than the old or experienced workers.

c. Additional cost of recruitment and training.

d. Untrained or new workers causes more breakage of tools, wastage of material, defective, etc.

Effect of high and low labour turnover

High labour Turnover	Low Labour Turnover
➢ Decrease in production targets, ➢ Increase in the cost of selection, recruitment and training, ➢ Increase in material wastage and tool breakage, ➢ Increase in the chances of breakdown of machinery at the shop floor level, ➢ Increase in the number of accidents, ➢ Loss of customers and their brand loyalty due to 1. non supply of the finished goods; or 2. substandard production of finished goods	➢ Low cost of selection, recruitment and training ➢ Minimum material wastage, tool breakage and breakdown of machines ➢ Reduction in number of accidents ➢ No loss of customers due to timely and continuous supply of finished goods.

Steps to minimise Labour Turnover:

1. **Exit interview** with each outgoing employee to ascertain the reasons for his leaving the organisation.
2. **Job analysis & evaluation** carried out even before recruitment to ascertain the requirements of each job.
3. **Scientific system of recruitment,** placement and promotion, by fitting the right person in the right job.
4. **Enlightened attitude of management -** Mental resolution on the part of management by taking workers into confidence and creating a healthy working atmosphere, with measures such as:

➢ Framing Service Rules after discussion between management and workers union.

➢ Provision of facilities for education, training and development of workers.

➢ Introduction of procedures for settlement of worker's grievances.

5. Use of Committee, comprising of members from management and workers to handle issues concerning worker's grievance, requirements, etc.

Turnover Ratios:

There are 3 methods to calculate labour turnover ratios:

(1) Replacement Method

$$\text{Ratio} = \frac{\text{No. of employees replaced during the year}}{\text{Average no. of employees on the roll}} \times 100$$

(2) Separation Method

$$\text{Ratio} = \frac{\text{No. of employees separated during the year}}{\text{Average no. of employees on roll during the year}} \times 100$$

(3) Flux Method

$$\text{Ratio} = \frac{\text{(No. of Employees separated + No. of Employees joined during the year)}}{\text{Average number of employees on the roll.}} \times 100$$

- **Employee turnover due to new recruitment =**

$$\frac{\text{No. Of Separation + No. Of Replacement + No. Of new joining}}{\text{Average no. Of employees during the period on roll}} \times 100$$

- **Equivalent employee turnover rate =**

$$\frac{\text{Employee turnover rate for the period}}{\text{Number of days in the period}}$$

VII. LABOUR REMUNERATION SYSTEMS

1. Time Rate:

Hours Worked X Rate-per hour OR Days Worked X Rate per day OR Weeks Worked X Rate per week

(Under this method, every worker gets the wages for actual time spent by him on the job irrespective of his efficiency)

High Wage Plan

Under the High Wage Plan, Total wages paid to the worker = Hours Worked x Rate per hour. However, the wage rate is substantially higher than that prevailing in the area / industry. In return, he is expected to maintain a very high level of performance, both quantitative and qualitative. This plan is suitable where high quality of work and also increased productivity are required.

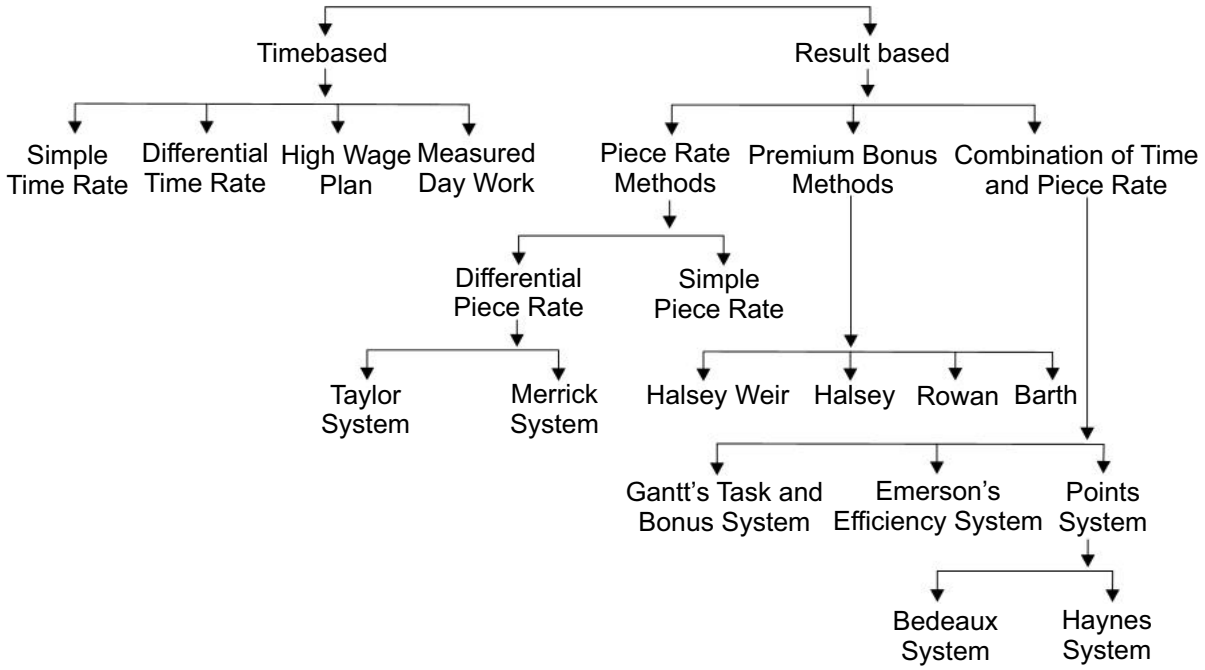
Advantages:

a. It is simple and inexpensive to operate.
b. It helps in attracting highly skilled and efficient workers by providing suitable incentive.
c. It reduces the extent of supervision.
d. Increased productivity may result in reduction of unit labour cost.

Disadvantages:

a. Higher wages are to be paid every time.
b. Lesser supervision may result in sub-standard quality.

Overview of Wage & Incentive systems



2. Differential Time Rate System

According to this method, different hourly rates are fixed for different levels of efficiency. Up to a certain level of efficiency the normal time or day rate is paid. Based on efficiency level the hourly rate increases gradually. The following is an example of differential time rate system:

Up to, say 75% efficiency	Normal (say ₹N per hr.)
From 76% to 80% efficiency	1.10 x N
From 81% to 90% efficiency	1.20 x N
From 91% to 100% efficiency	1.30 x N
From 101% to 120% efficiency	1.40 x N

3. Straight piece Rate System:

Number of Units Produced X Rate per unit

(Efficient worker earns higher wages under this method)

Advantages:

a. The system is simple to operate and easy to understand.
b. The incentive provided is quite effective as the workers get the full benefit of any increase in production and the employer also gains by saving on overhead costs.
c. Labour cost per unit being constant, these can be calculated in advance and quotations can be confidently submitted.

Disadvantages:

a. The quality of output is not guaranteed since focus is primarily on quantity.
b. Maintenance of detailed statistics of production of individual workers is necessary.
c. Maintenance of satisfactory discipline in the matter of arrival and departure of workers is slightly difficult.
d. There may be wastage of resources like materials, machinery etc. since workers are anxious to produce more.

e. Skilled workers and supervisors (who are often paid on time basis) may resent higher wages to unskilled workers paid on piece basis.

4. Halsey Premium Plan / Halsey Weir Premium System

(Hours worked X Rate per hour) + 50% (Time Saved X Rate per hour)

* Under the Halsey Weir System, the % of bonus may vary in the range between 30% to 70%

Merits:

a. Time Rate is guaranteed.
b. Workers can earn more by saving time.
c. Employer gets 50% share of time saved.

Demerits:

a. Incentive is not as strong as piece rate system.
b. Rate per piece is lower than under simple piece rate.
c. Employee gets reward for only 50% of the time saved.

5. Rowan System

$$\text{(Hours worked X Rate per hour)} + \frac{\text{Time saved}}{\text{Time allowed}} \text{ X (Hours worked X Rate per hour)}$$

Merits:

a. Time Rate is guaranteed.
b. Workers can earn more by saving time.
c. Share between employer and worker is equitable.
d. Moderately efficient workers are rewarded reasonably than under Halsey Plan.

Demerits:

a. Incentive is not as strong as piece rate system.
b. It is difficult to compute than Halsey System.
c. Sharing principle is not welcomed by employees.
d. Where time saved is more than 50% of time allowed, the incentive is lower.

IX. DISTINGUISH BETWEEN CASUAL WORKER AND OUTWORKER

Particulars	Casual Worker	Out Worker
1. Meaning	A casual worker is appointed for a short duration to carry on normal business activities in place of a regular but temporarily absent worker.	A worker who does not work in the factory premises but either works in his home or at a site outside the factory is known as an outworker.
2. Remuneration	He is paid on daily time basis. He is also known as daily wage worker or badli worker.	An outworker who works in his home is usually compensated on the basis of his output.

3. Nature of work	He is engaged for the regular work inside the factory.	He is supplied with raw materials and tools necessary for carrying out the job. An outworker (outside the factory) is usually engaged on specialised jobs / contract work.

X. LABOUR PRODUCTIVITY / EFFICIENCY

It refers to the levels of efficiency attained by the workers. It is computed as under :

➢ Based on Time : $\frac{\text{Standard Time allowed for actual output}}{\text{Actual Time taken}}$

➢ Based on Output : $\frac{\text{Actual Output}}{\text{Standard Output for the time worked}}$

Factors considered for increasing labour productivity:

a. Employing only those workers who possess the right type of skill.
b. Placing a right type of man on the right job.
c. Training young and old workers by providing them right opportunities.
d. Taking appropriate measures to avoid excess or shortage of labour at the shop floor.
e. Carrying out work-study for fixing wage rates, and for simplification and standardisation of work.

MULTIPLE CHOICE QUESTIONS

1. The input output ratio in case of labour means

(a) The value of output to the wages paid
(b) Actual hours paid for and production made in units
(c) Abnormal idle time and normal idle time
(d) None of the above

2. Job Specification is

(a) The list of operations to be performed for completing the concerned job
(b) The requirement in terms of goods to be produced or work to be done
(c) The list of qualities and qualifications which the employee concerned should have to do the job well
(d) A list containing the names of employees who will be assigned to different jobs

3. Direct labour means

(a) Labour completing the work manually
(b) Labour which is recruited directly and not through contractors
(c) Permanent labour in the production department
(d) Labour which can be conveniently associated with a particular cost unit.

4. Time and Motion Study is essential for

(a) A rational promotion policy
(b) Completing a job on time
(c) Determining the standard time and correct method of completing a task
(d) Determining prices of products

5. For reducing the labour cost per unit, which of the following factors is most important

(a) Low wage rates
(b) Higher output to input ratio
(c) Strict control and supervision
(d) Longer hours of work

6. Which of the following statements are true

(a) Productivity of workers can be improved only if they are supervised closely
(b) It is no use paying higher wages to labour because they would spend their money on drinking and smoking
(c) A well satisfied & motivated team of workers can raise productivity to a large extent
(d) None of the above

7. Labour turnover is measured by

(a) Replacement method
(b) Separation method
(c) Flux method
(d) All the above

8. Salary of a foreman should be classified as

(a) Administration overheads
(b) Production overheads
(c) Selling and distribution overheads
(d) Variable overheads

9. Merit Rating means

(a) Giving merit certificates to the workers
(b) The system of labour remuneration
(c) The process of determining relative worth of an employee
(d) None of the above

10 Which of the following is not a cause of labour turnover

(a) Seasonal nature of the business
(b) Marriages, death, retirement etc.
(c) Low wages & allowances
(d) TDS deduction from the salary of workers

11 Process of determining relative worth of different jobs is known as -

(a) Job Evaluation
(b) Merit Rating
(c) Both of these
(d) None of these.

12 _____ is a comparative evaluation & analysis of individual merits of employees working on similar jobs.

(a) Job Evaluation
(b) Merit Rating
(c) Both of these
(d) None of these

13 Which of the following is an avoidable cause of labour turnover

(a) Seasonal nature of the business
(b) Marriages, death, retirement etc.
(c) Low wages & allowances
(d) Family responsibility

14 Which factors are to be considered for Job Evaluation –

(a) Analytical & Conceptual Skill
(b) Experience
(c) Efficiency
(d) None of the above

15 Which factors are to be considered for Merit Rating -

(a) Association with the organisation
(b) Experience
(c) Efficiency
(d) All of the above

EMPLOYEE COST AND DIRECT EXPENSES

Introduction : It is significant component of total cost, Generally highest for service sector organisation & second highest for manufacturing organisation. Success of an organisation is dependent on quality of work force associated with it. It is difficult task for the management to deal with human being as they have different background, culture, Education, philosophical priorities, religion etc

Labour cost is divided in 2 parts :

Direct Labour cost	Indirect labour cost
① It is the cost incurred in payment for employees who are directly engaged in prod process	① It is the cost incurred in payment for employees who are not directly engaged in prod process
② Direct employee cust can be easily identified & associated with a cost object or cost unit	② Indirect employee cost is to be apportioned over cost centres on suitable/appropriate basis
③ Direct labour cost varies with volume of production (It has positive relation with No of units produced)	③ Indirect labour cost may or not vary as per volume of production.

Direct labour cost will become part of prime cost whereas indirect labour cost will become of overhead cost.

Mananagement tries to make best possible use of human resources available with it at minimum possible cost. (optimum use of human resource)

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What is time keeping and time booking record?

I There are 2 types of Labour records
i) time keeping records ii) Time Booking records

1) Time keeping records : This is exact recording of employee's attendance time. (Time in to Time out)
Time keeping records can be maintained with the help of
a) Hand written records b) Disc c) punch cards d) Tokens
e) Bio metric machines etc

2) Time Booking record : It is the exact recording time spent by workers on various jobs/orders/processes etc.
Time booking records can be maintained with the help of
a) Job cards b) Time-cards

II Difference between time recorded as per time keeping records & time booking records is known as Idle time
Idle time is further divided in 2 parts
a) Normal idle time b) Abnormal idle time.

1) causes for normal idle time :
i) time to reach production floor from factory gate
ii) time lost beth end of one job & start of new job
iii) Lunch, tea, refreshment breaks
iv) time required for set up of machine
v) time required to come out of tiredness & fatigue etc

2) Causes of abnormal idle time
i) Machine Breakdowns ii) Accidents iii) power failure
iv) shortage or unavailability of raw materials etc

III Wages paid for normal idle time will be included in cost of production either by inflating the wage rate

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or by including it in Factory overhead cost whereas wages paid for abnormal idle time will be directly debited to costing P & L A/c.

What are the objectives of maintaining Time Keeping & Time Booking Records?

1. Payroll preparation
2. Ascertainment & control of labour cost
3. overtime calculation
4. overhead cost distribution
5. Disciplinary measures
6. statutory compliances (Legal compliance)

What is Time & Motion Study?

1. Timestudy is defined as recording & analysis of time required for a job with a view to set standard time for a job. motion study implies analying the work in to basic operations or motions in a job. These methods are complentary to each other.
2. Father of these studies - Gilbreth who had studied the movements required in a brick laying process & reduced the movements from 18 to 6. He named these movements

3 steps in time & motion study:
i) observation of workers to record their movements
ii) classification of movements into ⓐ Necessary ⓑ wasteful
iii) improvisation of necessary movements & elimination of wasteful movements
iv) provision for standard tools & equipments
v) observation & recording time for necessary movements & setting the standard time for new workers

What is Labour Turnover? What are the causes of Labour Turnover?

① Rate of change in work force during a specified period is known as labour turnover. There are 3 main causes of labour turnover

ⓐ personal causes	ⓑ Avoidable causes	ⓒ unavoidable causes
i) change of job for betterment	i) Dissatisfaction with work culture, salary, working hrs etc	i) seasonal nature of business
ii) pre-mature retirement due ill health or other reasons	ii) strained relationship with management etc	ii) slack market
iii) Family problems & Family responsibilities	iii) lack of training, medical facilities	iii) change of plant location
iv) Marriages specially in case of women) etc	iv) lack of promotional avenues etc	iv) Disciplinary causes
		v) Death, reaching age of retirement
		vi) Disability making the worker unfit for the job etc

What are the effects of Labour Turnover?

1. production schedule gets disturbed
2. smooth workflow gets disturbed.
3. New workers may not be as efficient as old workers which may increase machine break downs, accidents, wastage of raw materials etc
4. Additional cost of training, recruitment etc
5. sub-standard production.
6. Impact on customer loyalty also.

What are the steps that can be taken to minimize Labour Turnover?

1. Exit interview
2. Job analysis & job evaluation - is carried out even before recruitment to ascertain requirements of Job (Right person should be appointed for right job)
3. scientific system of recruitment
4. Enlightened attitude of management
5. use of cummitees

commiteesThere

What are the methods to measure Labour Turnover?

There are 3 methods to measure labour turnover:

1. separation method

$$\text{Labour turnover ratio} = \frac{\text{No. of workers left/discharged during the period}}{\text{Avg no of workers on Roll during the period}} \times 100$$

② Replacement method

$$\text{Labour turnover ratio} = \left(\frac{\text{No. of workers replaced during the period}}{\text{Avg no of workers on Roll during the period}}\right) \times 100 \text{ times}$$

③ Fleae method

$$\text{Labour turnover ratio} = \left(\frac{\text{No. of workers left during the period} + \text{No. of workers joined during the period}}{\text{Avg no of workers on Roll during the period}}\right) \times 100 \text{ times}$$

where

$$\left(\text{Avg No. of workers on Roll during the period}\right) = \left(\frac{\text{opening no. of workers} + \text{closing no. of workers}}{2}\right)$$

i.e.

Question 1 :

Calculate the wages payable to 3 workers A, B & C under different methods of remuneration.
The following data is relevant for the purpose.
Time Rate ₹30 per hour; Std. time allowed for one piece is 20 minutes.
Production made by workers in a day of 8 hours is -
A - 30 units, B - 24 units C - 20 units.
Calculate their wages under
(a)Time Rate system
(b) Piece Rate basis
(c) Halsey Premium System
(d) Rowan System

Also calculate Effi ratio for each worker

① key data

workers	Actual output (units)	standard time taken for actual output (hrs)	Time saved (hrs)	ordinary piece rate p.u. = (wages per hr × Std. hrs p.u.)
A	30	= 10 hrs	2	₹30 × (20/60) = ₹10
B	24	= 8 hrs	0	₹10
C	20	= 6.66 hrs	-	₹10

② calculation of Total wages under :

i) Time rate scheme = (Hrs worked × wage rate per hour)

A : (8h25 × ₹30) = ₹240/-
B : (8h2 × ₹30) = ₹240/-
C : (8h25 × ₹30) = ₹240/-

ii) ordinary piece rate scheme = (No. of units produced × ordinary piece rate)

Workers
A : (B units × ₹10) = ₹300
B : (24 units × ₹10) = ₹240
C : (20 units × ₹10) = ₹200

iii) Halsey's premium plan

= (Hrs worked × Rate per hr) + 50% (Time saved × Rate per hour)

Workers
A : (8hrs × ₹30) + 50% (2hrs × ₹30) = ₹270/-
B : (8hrs × ₹30) + 0 = ₹240/-
C : (8hrs × ₹30) + 0 = ₹240/-

iv) Rowan's premium plan

= (Hrs worked × Rate per hr) + (Time saved / Time allowed × Basic Time wages)

Workers
A : (8hrs × ₹30) + (2hrs / 10hrs × ₹240) = ₹288/-
B : (8hrs × ₹30) + 0 = ₹240/-
C : (8hrs × ₹30) + 0 = ₹240/-

(3) calculation of efficiency ratio

= (Total wages as per piece rate scheme / Total wages as per Time rate scheme) × 100 times

Workers
A : (₹300/₹240) × 100 = 125%
B : (₹240/₹240) × 100 = 100%
C : (₹200/₹240) × 100 = 83 1/3 %

Question 2 :

Calculate the normal and over time wages payable to a workman from the following data -

Days	Hours
Monday	8 hours
Tuesday	10 hours
Wednesday	9 hours
Thursday	11 hours
Friday	9 hours
Saturday	5 hours
Total	52 hours

Normal Working hours 8 hours per day
Normal Rate ₹ 5 per hour

Overtime rate up to 9 hours in a day at single rate and over 9 hours in a day at double rate or up to 48 hours in a week at single rate and over 48 hours at double rate, whichever is more beneficial to the workman.

(1) When overtime rate paid up to 9 hrs in a day at single rate & over 9 hours a day at double rate

Day	Hours worked	Hrs to be paid at single rate	Hrs to be paid at Double rate
Monday	8	8	0
Tuesday	10	9	1
Wednesday	9	9	0
Thursday	11	9	2
Friday	9	9	0
Saturday	5	5	0
	Total	49	3

Total wages payable for the week = (49 hrs x ₹5) + (3 hrs x ₹10)

OR

= (52 hrs x ₹5) + overtime premium

= (52 hrs x ₹5) + (3 hrs x ₹5)

(2) when overtime is paid at single rate up to 48 hrs per week & Double rate beyond that

Total wages payable for the week

= (48 hrs × ₹5) + (52 hrs − 48 hrs) × ₹10

= ₹240 + (4 hrs × ₹10) = ₹240 + ₹40 = ₹280

OR

= (52 hrs × ₹5) + overtime premium

= ₹260 + (4 hrs × ₹5 per hour) = ₹280

(3) Total wages payable to worker

= ₹275 or ₹280 whichever is beneficial to worker

= ₹280 (which includes normal wages of ₹260 for 52 hrs & overtime premium of ₹20 for 4 hrs)

Question 3 :

From the following particulars work out the earnings for the week of a worker under -

a. Straight Piece Rate

b. Differential Piece Rate

c. Halsey Premium System

d. Rowan System

Number of working hours per week	-	48;
Wages per hour	-	₹ 3.75
Normal time per piece	-	24 minutes;
Normal output per week	-	120 pieces.

= std time p.u of output

Actual output for the week -150 pieces, Differential Piece Rate 80% of piece rate when output is below standard and 120% when output is above standard.

(1) key data

i) ordinary straight piece rate p.u = (wages per hour / Std output in one hour)

= ₹3.75 / (60 mins / 24 mins) = ₹3.75 / 2.5 units = ₹1.50 per unit

ii) Time saved = Time allowed − Time taken

= (Standard time per unit × Actual output) − Actual time taken

= (24 hrs × 150 pieces) − 48 hrs

= 60 hrs − 48 hrs = 12 hrs

② calculation of Total wages under :

i) straight piece rate scheme

= (No. of units produced × ordinary piece rate p.u.)

= 150 units × ₹1·50 p.u. = ₹225/-

ii) Halsey's premium plan

= (Hrs worked × Rate per hr) + 50% (Time saved × Rate per hr)

= (48 hrs × ₹3·75) + 50% (12 hrs × ₹3·75)

= ₹180 + ₹22·50 = ₹202·50

iii) Rowan's premium plan

= (Hrs worked × Rate per hr) + (Time saved / Time allowed × Basic Time)

= (48 hrs × ₹3·75) + (12 hrs / 24 hrs × ₹180)

= ₹180 + ₹36 = ₹216/-

iv) Differential piece rate scheme

= No. of units produced × Differential piece rate

= 150 units × (ordinary piece rate p.u. × 120%)

= 150 units × (₹1·50 × 120%) = 150 units × ₹1·80 p.u.

= ₹270/-

As output is above standard, Differential piece rate p.u. is 120% of ordinary piece rate p.u as per given information.

Question 4 : (Questions on Group Bonus)

Ten men are working as a group on a particular manufacturing project. When the weekly production of the group exceeds a standard number of pieces per man hour, each man in the group is paid a bonus for the excess production, in addition to his wages at hourly rates. The amount of bonus is computed by first determining the percentage by which the group's production exceeds the standard. One half of this percentage is then applied to wage rate of ₹8 to determine an hourly bonus rate, irrespective of the variation in individual hourly wages rates. Each man in the group is paid as a bonus, this bonus rate applied to his total hours worked during the week. The standard rate of production before a bonus can be earned is 200 pieces per man-hour.

Actual hours worked and output produced in a week is given below:

Day	Man-hours worked	Production pieces
Monday	72	17,680
Tuesday	72	17,348
Wednesday	72	18,000
Thursday	72	18,560
Friday	71.5	17,888
Saturday	40	9,600
Total	399.5	99,076

On the basis of production record stated above, compute -

i. the rate and amount of bonus for the week

ii. the total wages of 'A' who worked 40 hours at a base rate of Rs. 6 per hour and of 'B' who worked 39 ½ hours at a base rate of ₹ 9 per hour.

iii. How much is the labour bonus cost to be attached to each unit of the week's production.

(1) calculation of rate & amount of bonus for the week

Standard output for the week = 200 pieces per man hour × Actual hrs worked

= 200 pieces × 399.5 hrs

= 79,900 pieces

Actual output for the week = 99,076 pieces

∴ output for the week in excess of standard = 99,076 − 79,900

= 19,176 pieces

∴ % by which Group's actual production exceeds the standard = $\frac{19,176}{79,900} \times 100$

∴ Hourly Bonus rate = [illegible]% × ₹8 per hour = ₹0.96 per hour

∴ Amount of Bonus for the week = 399.50 hrs × ₹ 0.96
= ₹ 383.52

(2) i) Total wages payable to worker - A
= Basic wages + part of Group Bonus
= (40 hrs × ₹ 6) + (40 hrs × ₹ 0.96 per hr)
= ₹ 240 + ₹ 38.40 = ₹ 278.40

ii) Total wages payable to worker - B
= Basic wages + part of Group Bonus
= (39.50 hrs × ₹ 9) + (39.50 hrs × ₹ 0.96 per hr)
= ₹ 355.50 + ₹ 37.92 = ₹ 393.42

(3) Labour bonus cost to be attached to each unit of week's production

= (Total Bonus payable for the week / Actual output for the week)

= (₹ 383.52 / 99,076 pieces) = ₹ 0.0038709677 per piece

Advantages of Group Incentive Scheme

① co-ordination among workers will increase
② Healthy competition
③ Better work culture
④ overall rise in productivity
⑤ Fall in labour cost P.U. etc

Question 5 :

An employee working under a bonus scheme saves 12 hours in a job for which the standard time is 60 hours. Calculate the rate per hour worked and wages payable to a worker, if incentive bonus of 10% on the hourly rate is payable when standard time (namely 100% efficiency) is achieved, and a further incentive bonus of 1% on hourly rate for each 1% in excess of that 100% efficiency is payable. Assume that the normal rate of payment is ₹ 5 per hour.

① calculation of efficiency ratio for the employee

$= \left(\frac{\text{standard time}}{\text{Actual time}}\right) \times 100 = \left(\frac{60\text{hrs}}{\quad} \times 100\right) = 125\%$

Time saved = standard time − Actual time

∴ Actual time = standard time − time saved = 60hrs − 12hrs

= 48hrs

② calculation of Hourly Bonus rate

= (10% on hourly rate for acheiving 100% efficiency) + (1% additional bonus for every 1% efficiency in excess of 100%)

= (10% + 25%) on hourly rate of ₹5

= 35% on ₹5 = ₹ 1.75 per hour

③ Total wages payable to worker

= Basic wages + Incentive

= (48hrs × ₹5) + (48hrs × ₹1.75)

= ₹240 + ₹84 = ₹324

∴ Effective wage rate per hour = $\left(\frac{\text{Total wages payable}}{\text{Hrs worked}}\right) = \frac{₹324}{48\text{hrs}}$

= ₹6.75

Question 6 :

During the first week of April, 2004 the workman Mr. Kalyan manufactured 300 articles. He receives wages for a guaranteed 48 hours week at the rate of ₹4 per hour. The estimated time to produce one article is 10 minutes and under incentive scheme the time allowed is increased by 20%. Calculate his gross wages according to -

a. Piece-work with guaranteed weekly wage

b. Rowan premium bonus and

c. Halsey premium bonus 50% to workman.

① i) calculation of ordinary piece rate per unit

= Wages per hr × std hrs p.u. = ₹4 × (10/60) hrs = ₹0.666666 p.u.

OR = (Wages per hr / Standard output per hour) = ₹4 / (60 mins / 10 mins p.u.) = ₹4/6 units = ₹0.666666 p.u.

ii) Time saved by workman Kalyan = Standard time − Actual time

= (std. time p.u. × Actual output) − 48 hrs

= (12/60 hrs × 300 units) − 48 hrs = 60 hrs − 48 hrs = 12 hrs

(Time allowed p.u. for incentive schemes) = [10 mins + 20% (10 mins)] = 12 mins.

② calculation of Total wages under :

i) piece work with Guaranteed weekly wages

(a) wages as per ordinary piece rate scheme = 300 units × 0.666 = ₹200/

(b) Guaranteed weekly wages = 48 hrs × ₹4 = ₹192

} whichever is higher

∴ Wages payable to workman Mr. Kalyan = ₹200/-

ii) Rowan's premium bonus plan

= (Hrs worked × Rate per hr) + (Time saved / Time allowed × Basic Time wages)

= (48 hrs × ₹4) + (12 hrs / 48 hrs × ₹192) = ₹192 + ₹38.40

= ₹230.40

iii) Halsey's premium bonus plan

= (Hrs worked × Rate per hr) + 50% (Time saved × Rate per hr)

= (48hrs × ₹4) + 50% (12hrs × ₹4) = ₹192 + ₹24

= ₹216/-

Question 7 : (Important - concept)

What are the main features of Halsey and Rowan Methods of payment of remuneration? State how Rowan Scheme is better than Halsey Scheme. Given time allowed of 30 hours for a job and the wage rate of ₹4 per hour, illustrate your answer by assuming your own figures for time taken to do the job.

① Analysis of Halsey's & Rowan's plan with calculation of Total wages, Effective wage rate per hour under both schemes

Time taken (hrs)	Time saved (hrs)	Basic time wages (₹)	Halsey's plan			Rowan's plan		
			Incentive (₹)	Total wages (₹)	Effective wage rate per hr (₹)	Incentive (₹)	Total wages (₹)	Effective wage rate per hr (₹)
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
Adhoc		= 9 × 4	= 50% × b × 4	= (c+d)	= (e/a)		= (c+g)	= (h/a)
30	0	120	0	120	4.00	0	120	4.00
25	5	100	10	110	4.40	16.6666	116.6666	4.6666
20	10	80	20	100	5.00	26.6666	106.6666	5.3333
15	15	60	30	90	6.00	30.000	90	6.00
10	20	40	40	80	8.00	26.6666	66.666	6.6666
5	25	20	50	70	14.00	16.6666	36.6666	7.3333
2	28	8	56	64	32.00	7.[illegible]	[illegible]	[illegible]
1	29	4	58	62	62.00	3.8666	7.8666	7.86666

2) Main features of Halsey's , Rowan's plan

i) when time saved = 50% (Time allowed)

then (Incentive under Rowan's scheme) = (Incentive under Halsey's scheme)

ii) when time saved < 50% (Time allowed)

then (Incentive under Rowan's scheme) > (Incentive under Halsey's scheme)

iii) when time saved > 50% (Time allowed)

then (Incentive under Rowan's scheme) < (Incentive under Halsey's scheme)

iv) Under Halsey's scheme amount of bonus goes on increasing with increase in time saved. Under Rowan's scheme amount of bonus increases with increase in Time saved and bonus becomes maximum when time saved is equal to 50% of Time allowed. Later on amount of bonus decreases with increases in time saved.

3) Justification for : Rowan's scheme is better than Halsey's scheme.

I) When time saved is less than 50% of time allowed, Incentive under Rowan's scheme is more as compared to Halsey's scheme. In majority cases worker's Time saved will be less than 50% of Time allowed. ∴ Majority of the workers will be benefited because of Rowan's scheme.

ii) Rowan's scheme won't motivate the workers to work at excessively high speed as bonus amount decreases after a particular point whereas under Halsey's plan workers are tempted to work at excessively high speed as his incentive continuously increases with increase in Time saved, which many also lead to sub-standard production, excess material wastage, Accidents, Machine Breakdowns etc, Adverse impact on health of workers.

iii) Rowan's scheme will safeguard the management against the loose standards set by then, if any.

Considering all these points Rowan's scheme is beneficial from workers as well as management's point of view.

Additional Question :

Standard time p.u. of output = 12 mins

No. of unit produced by worker- x in 20 hrs = 135 units

Basic wage rate = ₹150 per unit

Calculate Total wages as per time rate, Halsey's plan

⟹

① ordinary piece rate p.u. = wages per hour × std hrs p.u

₹150 = 495s per hr (12) hrs

∴ wages per hour = Basic wage rate = ₹150 × 5

= ₹750

② Time saved = (Time allowed − Actual time taken) for Actual output

(1 hr × 135 units) − 20 hrs = 27 hrs − 20 hrs = 7 hrs

③ Total wages as per Time rate scheme = Hrs worked × Rate per hr

= 20 hrs × ₹750 = ₹15,000

④ Total wages as per Halsey's plan

= (Hrs worked × Rate per hr) + 50% (Time saved × Rate per hour)

= (20 hrs × ₹750) + 50% (7 hrs × ₹750)

= ₹15,000 + ₹2,625 = ₹17,625/-

Question 8 :

Wage negotiations are going on with the recognised Labour Union and the Management wants you as the Cost Accountant of the Company to formulate an incentive scheme with a view to increase productivity.

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

Assuming that day wages would be guaranteed at ₹6 per hour and the piece rate would be based on a standard hourly output of 10 units, calculate the earnings of each of the three workers and the labour cost per 100 pieces under -

(i) Day Wages,
(ii) Piece Rate,
(iii) Halsey Scheme and
(iv) The Rowan Scheme

① key - data

Workers	Hrs worked	No. of units produced	Standard time (Hrs)	Time saved	Actu. time	ordinary piece rate p.u.
X	8	180	$\frac{1}{10}$ hrs × 180 units = 18 hrs	18 − 8 = 10 hrs	8	₹6/10 units = ₹0.60 p.u.
Y	8	120	$\frac{1}{10}$ hrs × 120 units = 12 hrs	12 − 8 = 4hrs	8	₹0.60 p.u.
Z	8	100	$\frac{1}{10}$ hrs × 100 units = 10 hrs	10 − 8 = 2 hrs	8	₹0.60 p.u.

② Calculation of Total wages under

i) Day wages (i.e. Time rate scheme)

Workers	Earning of workers = Hrs worked × Rate per hr	Labour cost per 100 pieces = (Earning / No. of units produced) × 100
X	8hr5 × ₹6 = ₹48	₹48 / 180 pieces × 100 = ₹26.6666
Y	8hr5 × ₹6 = ₹48	₹48 / 120 pieces × 100 = ₹40
Z	8hr5 × ₹6 = ₹48	₹48 / 100 pieces × 100 = ₹48

ii) ordinary piece rate scheme

Workers	Earning of workers = (No. of units produced × piece rate p.u.)	Labour cost per 100 pieces (₹)
X	180 units × 0.60 = ₹108	₹108 / 180 pieces × 100 = ₹60
Y	120 units × 0.60 = ₹72	₹72 / 120 pieces × 100 = ₹60
Z	100 units × 0.60 = ₹60	₹60 / 100 pieces × 100 = ₹60

iii) Halsey's premium plan

Workers	Earning of workers = (Hrs worked × Rate per hr) + 50% (Time saved × Rate per hr)	Labour cost per 100 pieces (₹)
X	(8hrs × 6) + 50% (1hr × 6) = ₹54	₹78 / 180 pieces × 100 = ₹43.333
Y	(8hrs × 6) + 50% (4hrs × 6) = ₹60	₹60 / 120 pieces × 100 = ₹50
Z	(8hrs × 6) + 50% (2hrs × 6) = ₹54	₹54 / 100 pieces × 100 = ₹54

iv) Rowan's premium plan

workers	Earning of workers = (Hrs worker x Rate per hr) + (Time saved / Time allowed x Basic time)	Labour cost per 100 pieces (₹)
X	(8hrs x 6) + (10/60 x ₹48) = ₹74.6666	₹74.6666 / 180 pieces x 100 pieces = ₹41.48148
Y	(8hrs x 6) + (4/60 x ₹48) = ₹64	₹64 / 120 pieces x 100 pieces = ₹53.3333
YZ		
Z	(8hrs x 6) + (2/60 x ₹48) = ₹57.60	₹57.60 / 100 pieces x 100 pieces = ₹57.60

Question 9 :

Two workmen, Vishnu and Shiva, produce the same product using the same material. Their normal wage rate is also the same. Vishnu is paid bonus according to the Rowan system, while Shiva is paid bonus according to the Halsey system. The time allowed to make the product is 100 hours. Vishnu takes 60 hours while Shiva takes 80 hours to complete the product. The factory overhead rate is ₹10 per man-hour actually worked. The factory cost for the product for Vishnu is ₹7,280 and for Shiva it is ₹7,600.

You are required -

a. To find the normal rate of wages,

b. To find the cost of materials,

c. To prepare a statement comparing the factory cost of the products as made by the two workmen.

① Let material cost for the product be ₹ æ
& Basic wage rate per hour be ₹ y

Statement showing Factory cost

particulars	Vishnu	Shiva
(a) Direct materials (₹)	æ	æ
(b) Hrs worked (i.e. time taken)	60 hrs	80 hrs
(c) Hrs allowed (i.e. standard time)	100 hrs	100 hrs
(d) Time saved (c - b)	40 hrs	20 hrs
(e) Basic time wages (b x y)	60y	80y
(f) Incentive scheme applicable	Rowan's	Halsey's
(g) Incentive payable to worker	24y	10y
	= (40/100 x 60y)	= 50% (20 hrs x y)
(h) Total wages payable (e + g)	84y	90y
(i) Factory overheads (b x ₹10) (₹)	600	800
(j) Factory cost (a + h + i)	æ + 84y + 600	æ + 90y + 800
(k) Factory cost (Given)	₹ 7280	₹ 7600

From above table

æ + 84y + 600 = 7280 i.e. æ + 84y = 6,680 ----- ①

æ + 90y + 800 = 7600 i.e. æ + 90y = 6,800 ----- ②

Let's solve Equations ① & ② simultaneously

æ + 84y = 6,680

æ + 90y = 6,800

- - -

-6y = -120

y = 20

Let's put value of y in Equation ①

æ + 84y = 6,680

æ + (84 x 20) = 6,680

æ + 1680 = 6,680

æ = 5000

Therefore

∴ Normal rate of wages = ₹y = ₹201
& cost of materials = ₹2 = ₹5,0001

Fy

(2) Statement showing Factory cost of products made by 2 workmen

particulars	Vishnu	Shiva
(a) Direct materials (₹)	5,000	5,000
(b) Total wages payable (₹)	1,680	1,800
	(84 x 20)	(90 x 20)
(c) Prime cost (a+b) (₹)	6,680	6,800
(d) Factory overheads (₹)	600	800
(e) Factory cost (c+d) (₹)	7,280	7,600

Question 10:

The standard time for a job is 60 hours. The hourly rate of guaranteed wages is ₹0.75 per hour. Because of the savings in time, a worker gets an hourly rate of total wages at ₹0.90 per hour under Rowan Scheme. For the same savings in time, calculate the hourly rate of wages of a worker under Halsey Plan, assuming 50% is the bonus rate.

① Let time taken to complete the job in x hours

standard time to complete the job = 60 hrs

∴ Time saved = standard time − Actual time

$= (60 - x)$ hrs

Effective wage rate per hour under Rowan's scheme $= \left(\frac{\text{Total wages payable}}{\text{Hrs worked}}\right)$

$0.90 = \frac{(\text{Hrs tasked} \times \text{Rate per hr}) + \left(\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Basic time wages}\right)}{\text{Has worked}}$

$0.90 = \left[\frac{(x \times 0.75) + \left(\frac{60-x}{60} \times 0.75x\right)}{x}\right]$

$0.90x = 0.75x + \left(\frac{60-x}{60} \times 0.75x\right)$

$0.15x = \frac{60-x}{60} \times 0.75x$

$0.15x \times 60 = 60 - x$ ∴ $12 = 60 - x$

∴ $x = 60 - 12 = 48$ hrs

∴ Time taken by worker to complete the job = 48 hrs

∴ Time saved $= (60 - x)$ hrs $= 12$ hrs

② Calculation of Effective wage rate per hour under Halsey's scheme for same saving in time

$= \left[\frac{(\text{Has worked} \times \text{Rate per hr}) + 50\%\,(\text{Time saved} \times \text{Rate per hr})}{\text{Has worked}}\right]$

$= \left[\frac{(48 \text{ hrs} \times ₹0.75) + 50\%\,(12 \text{ hrs} \times ₹0.75)}{48 \text{ hrs}}\right]$

$= \frac{₹36 + ₹4.50}{48 \text{ hrs}} = \frac{₹40.50}{48 \text{ hrs}} = ₹0.8375$ per hour

Question 11:

Calculate 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:

Particulars	A	B
i. Basic Wages	₹1000	₹1600
ii. Dearness Allowance	50%	50%
iii. Contribution to Provident Fund (on basic wages)	8%	8%
iv. Contribution to Employee's State Insurance (on basic wages)	2%	2%
v. Overtime (Hours)	10	

The normal working hours for the month are 200. Overtime is paid at double the total of basic wages and dearness allowance. Employee's contribution to State Insurance and Provident Fund are at equal rates with employer's contribution. The two workers were employed on jobs X, Y and Z in the following proportions for the normal time spent by them. Overtime was done on job Y.

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

① Statement showing calculation of earning of 2 workers A, B for a month

particulars	worker - A	worker - B
a Basic wages (₹)	1,000	1,600
b Dearness allowance (ax 50%) (₹)	500	800
c Employer's contribution to provident Fund (ax 8%) (₹)	80	128
d Employer's contribution to ESI (9 x 2%) (₹)	20	32
e overtime wages of worker - A (₹) $\left(\frac{₹1000 + ₹500}{200 \text{ has}}\right) \times$ thas $\times 2$	150	—
f Total earning of workers for the month (Total CTC) (a+b+c+d+e) (₹)	1,750	2,560

(2) Statement showing allocation of labour cost over jobs - X, Y, Z

particulars	Job - X	Job - Y	Job - Z	Total (₹)
(a) Allocation of Normal wages payable to worker-A	₹640 (40%)	₹480 (30%)	₹480 (30%)	1,600 (1750 - 150)
(b) overtime wages paid to worker - A	—	₹150	—	150
(c) Allocation of Normal wages payable to worker-B	₹512 (20%)	₹512 (20%)	₹768 (30%)	2,560
(d) Total (a+b+c) (₹)	1,152	1,142	1,248	4,310

Question 12: (Important)

The management of Sunshine Ltd. wants to have an idea of the profit lost/ foregone as a result of labour turnover last year.

Last year sales accounted to ₹ 66,00,000 and the P/V Ratio was 20%. The total number of actual hours worked by the direct labour force was 3.45 lakhs. As a result of the delays by the Personnel Department in filling vacancies due to labour turnover, 75,000 potentially productive hours were lost. The actual direct labour hours included 30,000 hours attributable to training new recruits, out of which half of the hours were unproductive. The costs incurred consequent on labour turnover revealed on analysis the following:

Particulars	₹
Settlement cost due to leaving	27,420
Recruitment costs	18,725
Selection costs	12,750
Training costs	16,105

Assuming that the potential production lost due to labour turnover could have been sold at prevailing prices, ascertain the profit foregone / lost last year on account of labour turnover.

(P/V Ratio = profit volume ratio)

sales	2,00,000
(-) variable cost of goods sold	50,000
contribution	1,50,000
(-) Fixed cost for the period	25,000
profit	1,25,000

contribution expressed as a % of sales is known as P/V ratio

P/V ratio = (contribution / sales)

∴ contribution = sales × P/V ratio

∴ contribution foregone is as good as profit foregone

profitPluratio

Answer starts here

① Given data

20,000 potentially productive labour hrs

45,000 labour hrs has worked

75,000 has lost on a/c of labour turnover due to delay in filling up the vacancies

15,000 has are productive

30,000 hrs spent on training to new recruits

recruits15,000

15,000 hrs are productive

15,000 has are unproductive

Total productive hours 15,000 + 15,000 = 3,30,000 hrs

productive Hrs lost due to labour turnover = 75,000 + 15,000 = 90,000 hrs

② statement showing calculation of profit foregone or profit lost in last year because of labour turnover

particulars	Amount (₹)
a sales for the last year	66,00,000
b p/v ratio	20%
a contribution earned in last year by working for 330,000 productive hours (a x b)	13,20,000
a contribution per labour hour (13,20,000 / 3,30,000 hr)	4.00
e contribution foregone on 75000 potentially productive has lost due to delays in filling up the vacancies (75000 has x ₹4)	3,00,000
f contribution foregone 15,000 unproductive hours spent training new recruits (15,000 has x ₹4)	60,000
g settlement cost due to leaving	27,720
h recruitment cost	18,725

(i) selection costs — 12,750

(j) Training costs — 16,[illegible]

(k) Total profit foregone on account of labour turnover in last year — 4,3[illegible]0/-

(et f t g t h t i t j)

ftgthtitj

Question 13:

A Company is undecided as to what kind of wage scheme should be introduced. The following particulars have been compiled in respect of three systems, which are under consideration of the management:

Workers	A	B	C
Actual hours worked in a week	38	40	34
Hourly rate of wages (₹)	6.00	5.00	7.20
Production in units:			
Product P	21	- -	60
Product Q	36	- -	135
Product R	46	25	- -
Standard time per unit of product	**P**	**Q**	**R**
Minutes per unit	12	18	30

For the purpose of piece rate, each minute is valued at ₹0.10. You are required to calculate the wages of each worker under:

(i) Guaranteed hourly rate basis.

(ii) Piece work earnings basis, but guaranteed at 75% of basic pay (guaranteed hourly rate) if his earnings are less than 50% of basic pay.

(iii) Premium bonus basis, where the worker receives bonus based on Rowan scheme.

(i) calculation of wages of each worker under

(a) Guranteed hourly rate basis : (Hrs worked × Rate per hr)

A : 38h25 × ₹ 6 = ₹ 228

B : 40hrs × ₹ 5 = ₹ 200

C : 34 hrs × ₹ 7.20 = ₹ 244.80

228workersB

2244.80b

(b) piece work with Guaranteed wages

piece rate p.y. for product

wagesP

ordinary piece rate p.y.

Contact no.- 7710060128/12hrs × 0.10 = 2120 P.U.

R - 30mins × 0.10 = ₹ 3.00 P.U.

p.usordinary

i) wages payable to worker - A
= (21 units of P x 1.20) + (36 units of Q x 1.80) + (46 units of R x 3)
= ₹ 7228

ii) wages payable to worker - B
= (25 units of R x 3) = ₹ 75
As ₹ 75 < 50% (₹ 200), Here worker B will be paid with guaranteed wages of ₹ 150 (₹ 200 x 75%)

iii) wages payable to worker - C
= (60 units of P x 1.20) + (135 units of R x 3)
= ₹ 315

c) Rowan's premium bonus plan
= (Hrs worked x Rate per hr) + (Time saved / Time allowed x Basic Time wages)

worker A : (38 hrs x ₹ 6) + (2 hrs / 40 hrs x 38 hrs x ₹ 6) = ₹ 228

worker B : (40 hrs x ₹ 5) + 0 = ₹ 200

worker C : (34 hrs x ₹ 7.20) + [18.50 hrs / 37 hrs x (34 hrs x ₹ 7.20)]
= ₹ 244.80 + ₹ 86.2629
= ₹ 331.0629

Working note : calculation of Time allowed, Time saved for the workers

workers	Time allowed for actual output (Hrs)	Time saved (Hrs)	Time taken (Hrs)
A	[(2units × 12) + (36units × 18) + (46units × 30)] / 60 = 38 hrs	0	38hrs
B	(asunitsx 30mins) / 60 = 12.50hrs	—	40 hrs
C	[(6units × 12) + (139units × 18)] / 60 = 52.50hrs	12.50 hrs	34hrs

Question 14:

In a company, labour records disclosed the following:

No. of employees on 1.4.2020	= 1,800
No. of employees on 31.3.2021	= 2,200
No. of employees left during the year	= 200
No. of employee joined during the the year	= 600

Out of those joined during the year, 150 were appointed in the place of those, who left the organisation.

Calculate the labour turnover ratios under all the 3 methods.

Calculation of labour turnover ratio by :

① Separation method :

$$= \left(\frac{\text{No. of employees left during the year}}{\text{Avg. no. of employees on roll during the period}} \right) \times 100 \text{ times}$$

$$= \left[\frac{200}{\left(\frac{1800+2000}{2} \right)} \right] \times 100 = \frac{200}{2000} \times 100$$

$= 10\%$

② Replacement method

$$= \left(\frac{\text{No. of employees replaced during the year}}{\text{Avg. no. of employees on roll during the period}} \right) \times 100 \text{ times}$$

$$= \left(\frac{150}{2} \times 100 \right) = 7.50\%$$

③ Fluse method

$$= \left(\frac{\text{No. of workers left during the year} + \text{No. of workers joined during the year}}{\text{Avg. No. of workers on Roll during the year}} \times 100 \text{ times} \right)$$

$$= \left(\frac{200 + 600}{2} \times 100 \right) = 40\%$$

Question 15:

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

a) Basic pay	₹1,000 p.m.
b) Dearness allowance	₹200 p.m.
c) Bonus	₹20% of salary and D.A.
d) Other allowances	₹250 p.m.
e) Employer's contribution to P.F.	10% of salary and D.A.

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

(1) Statement showing calculation of effective hourly cost of employee

	Particulars	Amount (₹)
a	Basic pay for the year (1000 P.M × 12 months)	12,000
b	Dearness allowance (200 p.m. × 12)	2,400
c	Bonus 20% × (a+b)	2,880
d	other allowance (250 P.m × 12)	3,000
e	Employer's contribution to provident Fund (a+b) × 10%	1,440
f	Total cost to the company (CTC) (a+b+c+d+e)	21,720
g	Gross working hours of employee-X	2,400 hrs
h	normal idle time	400 hrs
i	Effective hours of employee-X for the year (g-h)	2,000 hrs
j	Effective hourly cost of employee-X (f/i) (i.e. Inflated wage rate per hour)	10.86

Question 16:

In a factory, the basic wage rate is ₹ 10.00 per hour and overtime rates are as follows:

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

The following hours have been worked on job 'Z' :

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

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

(a) Where overtime is worked regularly throughout the year as a policy due to the labour shortage.

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

(c) Where overtime is worked at the request of the customer to expedite the job.

(a) where overtime is worked because of abnormal reasons.

(1) Given data : Basic wage rate = ₹ 10.00 per hour

wage rate for hours worked before & after normal working hours = ₹ 10 × 175% = ₹ 17.50 per hour (including overtime premium of ₹ 7.50)

hourswage rate for hours worked on Sundays & holidays = ₹ 10 × 225% = ₹ 22.50 per hour (including overtime premium of ₹ 12.50)

(2) calculation of labour cost chargeable to Job - Z under

(a) overtime is worked regularly throughout the year as a polity due to labour shortage

Inflated wage rate per hour = (Total wages payable / Total hrs worked)

= (1,00,000 hrs × ₹10) + (20,000 hrs × ₹17.50) + (5,000 hrs × ₹22.50) / (1,00,000 + 20,000 + 5,000) hrs

= ₹14,62,500 / 1,25,000 hrs = ₹11.70 per hour

∴ Labour cost chargeable to job Z = 1125 hrs × ₹11.70 = ₹13,162.50

(b) overtime is worked irregularly to meet production requirements (unanticipated developments)

In this case overtime premium will be debited to Factory OH A/c

Labour cost chargeable to job Z = 1125 hrs × ₹10 = ₹11,250/-

overtime premium (From job Z) transferred to factory overheads = (100 hrs × ₹7.50) + (25 hrs × ₹12.50)

= ₹750 + ₹312.50 = ₹1,062.50

(c) overtime is worked at the request of customer to expediate the job

Labour cost chargeable to job Z = (1000 hrs × ₹10) + (425 hrs × ₹17.50) + (25 hrs × ₹22.50)

= ₹12,312.50

Sigma 12,312.50

(d) overtime is worked because of abnormal reasons

Labour cost chargeable to job Z = 1125 hrs × ₹10 = ₹11,250

overtime premium paid for the year will be directly debited costing P&L A/c

Question 17:

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

1. Workers recruited and joined and
2. Workers left and discharged.

① Labour turnover ratio by replacement method $= \left(\frac{\text{No. of workers replaced during the quarter}}{\text{Avg. No. of workers on Roll during the quarter}}\right) \times 100$ times

$0.05 = \left(\frac{30}{\text{Avg. No. of workers on Roll during the quarter}}\right)$

$\therefore$ Avg No of workers on Roll during the quarter $= \frac{30}{0.05} = 600$

② Labour turnover ratio by separation method $= \left(\frac{\text{No. of workers left \& discharged during the quarter}}{\text{Avg. No. of workers on Roll during the quarter}}\right) \times 100$ times

$0.03 = \left(\frac{\text{No of workers left \& discharged during the quarter}}{600}\right)$

No. of workers left & discharged during the quarter $= 600 \times 0.03 = 18$

③ Labour turnover ratio by Flux method $= \left(\frac{\text{No. of workers left during the quarter} + \text{No. of workers recruited \& joined during the quarter}}{\text{Avg. No. of workers on roll during the quarter}}\right)$

$0.10 = \left(\frac{18 + \text{No. of workers recruited \& joined during the quarter}}{600}\right)$

$\therefore$ No. of workers recruited & joined during the Quarter $= (600 \times 0.10) - 18$

$= 42$

Question 18:

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

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

Hourly rate of wages (guaranteed)	₹20
Average time for producing 1 piece by one worker at the previous performance (This may be taken as time allowed)	2 hours
No. of working days in the month	25
No of working hours per day for each worker	8
Actual production during the month	1,250 units

Required:

1. Calculate effective rate of earnings per hour under Halsey Scheme and Rowan Scheme.
2. Calculate the savings to Mr. A in terms of direct labour cost per piece under the schemes.
3. Advice Mr. A about the selection of the scheme to fulfill his assurance.

Statement showing calculation of effective earning per hour, saving in labour cost per piece under both incentive schemes

Particulars	Halsey's premium plan	Rowan's premium plan
(a) Standard time per piece (unit) of output	2 hrs	2 hrs
(b) Actual output for the month	1250 units	1,250 units
(c) Standard time for actual output (a x b)	2,500 hrs	2,500 hrs
(d) Actual time taken (8 hrs per day x 25 days x 10 workers)	2,000 hrs	2,000 hrs
(e) Time saved (c - d)	500 hrs	500 hrs
(f) Basic wage rate per hour (₹)	20	20
(g) Basic time wages for the month (₹) (d x f)	40,000	40,000

(h)	Incentive Bonus payable under respective scheme (E)	₹ 5000 (50% × 10)	8,000 (e × g)
(i)	Total earning of workers (F) (g+h)	45,000	48,000
(j)	Effective earning per hour (i/d)	₹ 22.50	₹ 24.00
(k)	Labour cost per piece under incentive scheme (i/b)	₹ 36.00	₹ 38.40
(l)	Labour cost per piece before incentive scheme i.e. at previous performance (2 hrs × ₹ 20)	₹ 40.00	₹ 40.00
(m)	saving in labour cost per piece (l-k)	₹ 4.00	₹ 1.60
(n)	Increase in earning per hour because of incentive scheme (j − ₹ 20)	₹ 2.50 (2.5012.50)	₹ 4.00
(o)	percentage increase in earning per hour (n/₹ 20) × 100	12.50%	20.00%

we advice to M/s A that : Rowan's incentive scheme should be introduced/selected in order to fulfill the assurance given to workers of 20% rise in their earning per hour.

Question 19: (Imp : Question on Group Bonus)

Both direct and indirect labours of a department in a factory are entitled to production bonus in accordance with a group incentive scheme, the outline of which is as follows:

(a) For any production in excess of the standard rate fixed at 16,800 tonnes per month (of 28 days) a general incentive of ₹15 per tonne is paid in aggregate. The total amount payable to each separate group is determined on the basis of an assumed percentage of such excess production being contributed by it, namely @ 65% by direct labour, @ 15% by inspection staff, @ 12% by maintenance staff and @ 8% by supervisory staff.

(b) Moreover, if the excess production is more than 20% above the standard, direct labour also get a special bonus @ ₹5 per tonne for all production in excess of 120% of standard.

(c) Inspection staff is penalized @ ₹20 per tonne for rejection by customer in excess of 2% of production.

(d) Maintenance staff is also penalized @ ₹20 per hour for breakdown.

From the following particulars for a month, work out the net production bonus earned by each group:

a) Actual working days: 25
b) Production: 21,000 tonnes
c) Rejection by customer: 500 tonnes
d) Machine breakdown: 40 hours

Statement showing calculation of Net production Bonus earned by each group

Particulars	Direct Labour	Inspection Staff	Maintenance Staff	Supervisory Staff	Total
(a) General incentive payable (₹)	58,500 (90,000 × 65%)	13,500 (90,000 × 15%)	10,800 (90,000 × 12%)	7,200 (90,000 × 8%)	90,000
(b) special Bonus payable	15,000	—	—	—	15,000
(c) penalty	—	(1,600)	(800)	—	(2,400)
(d) Net production Bonus payable (a+b+c)	73,500	11,900	10,000	7,200	1,02,600

working note i) General incentive payable

Actual production in excess of standard

$= \left(21000 \text{ tons} - \left(\frac{16800 \text{ tons}}{28 \text{ days}} \times 25 \text{ days}\right)\right)$

$= 21000 \text{ tons} - 15000 \text{ tons} = 6000 \text{ tons}$

∴ General incentive payable $= 6000 \text{ tons} \times ₹15 \text{ per ton}$

$= ₹90,00$

ii) special Bonus payable

$= \left[\text{actual production} - \left(120\% \times \text{standard production}\right)\right] \times ₹5 \text{ per ton}$

$= \left[21000 \text{ tons} - (120\% \times 15000 \text{ tons})\right] \times ₹5 \text{ per ton}$

$= (21000 \text{ tons} - 18000 \text{ tons}) \times ₹5 \text{ per ton} = ₹15000/-$

iii) penalty to Inspection staff

Rejection by customer in excess of 2% of production $= 500 \text{ tons} - (21000 \text{ tons} \times 2\%)$

$= 500 \text{ tons} - 420 \text{ tons}$

$= 80 \text{ tons}$

∴ penalty to inspection staff $= ₹220 \text{ per ton} \times 80 \text{ tons}$

$= ₹1600/-$

iv) penalty to maintenance staff

$= ₹20 \text{ per hour of break down} \times 40 \text{ hrs}$

$= ₹800/-$

Question 20:

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

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

Job card OR Time-card

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

Statement showing allocation of wages of the workers for the week

	particulars	Amount (₹)
a	Basic wages (₹100 per day × 6 days)	600
b	Dearness allowance (a × 120%)	720
c	Total wages payable for the week (a+b)	1,320
d	Total working hours as per Time keeping records (8 hrs per day × 6 days)	48 hrs
e	normal idle time for the week [(30 min meal break + 10 mins recess) × 6 days / 60] hrs	4 hrs
f	Effective labour cost per hour (₹) (₹1320 / (48 hrs − 4 hrs) = ₹1320/44 hrs)	30.00
g	Labour cost allocated to	00450.00
i	Job X : 15 hrs × ₹30	450.00
ii	Job Y : 12 hrs × ₹30	360.00
iii	Job Z : 13 hrs × ₹30	390.00
iv	costing P/L A/c : (44 − 15 − 12 − 13) hrs × ₹30 (Time not booked while waiting for the job is considered as abnormal idle time)	120.00
	Sub-total (g)	1,320

Question 21: (Important)

The company has a suggestion of box scheme and an award equivalent to one and a half months effective saving in labour cost is passed on to the employee whose suggestion is accepted. Suggestion of an employee to use a Jig for a manufacturing operation of a component is accepted. The cost of the Jig which has a life of one year is ₹2,000 and the use of the Jig will reduce the standard time by 8 minutes.

Compute from the following data the amount of award payable to the employee who has given suggestion.

1) Number of pieces to be produced in the year: 15,000
2) Standard time per piece before use of Jig: 80 minutes.
3) Average wage rate of workmen ₹160 per day of 8 hours.
4) Average efficiency of workmen: 80%

① Statement showing calculation of labour cost without & with use of Jig

particulars	without use of Jig	with use of Jig
(a) standard time per unit of output	80 mins	(80 − 8) mins
(b) Number of pieces produced in a year	15,000	15,000
(c) standard time for actual output [(a × b)/60] hrs	20,000 hrs	18,000 hrs
(d) Actual time taken = (standard time / Efficiency ratio) = c / 80%	25,000 hrs	22,500 hrs
(e) Labour cost per hour = (₹160/8 hrs)	₹20	₹20
(f) Total labour cost for the year (d × e)	₹5,00,000	₹4,50,000
(g) Saving in labour cost because of use of Jig		₹50,000 = (₹5,00,000 − ₹4,50,000)

(2) Statement showing calculation of amount of award payable to the worker who has given suggestion to use the Jig

particulars	Amt (₹)
(a) Saving in labour cost in a year because of use of Jig	[illegible]
(b) cost of Jig having useful life of one year	2,000 0
(c) Net saving in labour cost for the year (a-b)	48,000 [illegible]
(d) Amount of award payable to the worker (48,000 / 12 months x 1.50 months)	6,000 0

Question 22:

Efficiency Ratio or Productivity Ratio

Standard Time for producing 1 Unit = 3 hrs
Actual time taken by Worker A to produce 40 Units = 90 hrs
Find Efficiency Ratio of Worker A.

For worker - A

Time allowed p.u = standard time p.u = 3 hrs

Actual output = 40 units

Standard time for actual output = 3hrs × 40 units = 120 hrs

Actual time taken by worker - A = 90 hrs

Efficiency ratio = $\left(\frac{\text{Standard time for actual output}}{\text{Actual time taken}}\right)$ times

$= \left(\frac{120\text{ hrs}}{90\text{ hrs}}\right) \times 100 = 133.3333\%$

OR

Standard time p.u of output = 3hrs

Actual time taken by worker = 90 hrs

Efficiency ratio = $\left(\frac{\text{Actual time}}{\text{std. time p.u.}}\right)$

$= \left(\frac{90}{3}\right) \times 100 = 133.3333\%$

Efficiency ratio = $\left(\frac{\text{Actual output}}{\text{Standard output}}\right)$ times

$= \left(\frac{40\text{ units}}{30\text{ units}}\right) \times 100 = 133.3333\%$

Efficiency Ratio = $\left(\frac{\text{standard time}}{\text{actual time}}\right)$ = std. time p.u. × Actual output / Actual time taken

$= \left[\frac{\text{Actual output}}{\left(\frac{\text{Actual time taken}}{\text{std. time p.u.}}\right)}\right] = \left(\frac{\text{Actual output}}{\text{standard output at}}\right.$

Question 23:

Standard Time for producing 1 Unit = 20 Mins = (1/3) hrs
Actual time taken by Worker B to produce 200 Units = 50 hrs
Find Efficiency Ratio of Worker B.

⟹

① Standard time (i.e. time allowed) for 1 unit of output = 1/3 hrs (i.e. 20 mins)

Actual output by worker B = 200 units

∴ Standard time = standard time for actual output

Standard time = Std time p.u. × Actual output

= 1/3 hrs × 200 units = 66.6666 hrs

② Efficiency ratio = (Standard time / Actual time × 100) = (66.6666 hrs / 50 hrs × 100)

= 133.3333% = 133 1/3 %

② Efficiency ratio = (Standard time / Actual time × 100)

= (Std time p.u. × Actual output / Actual time taken × 100)

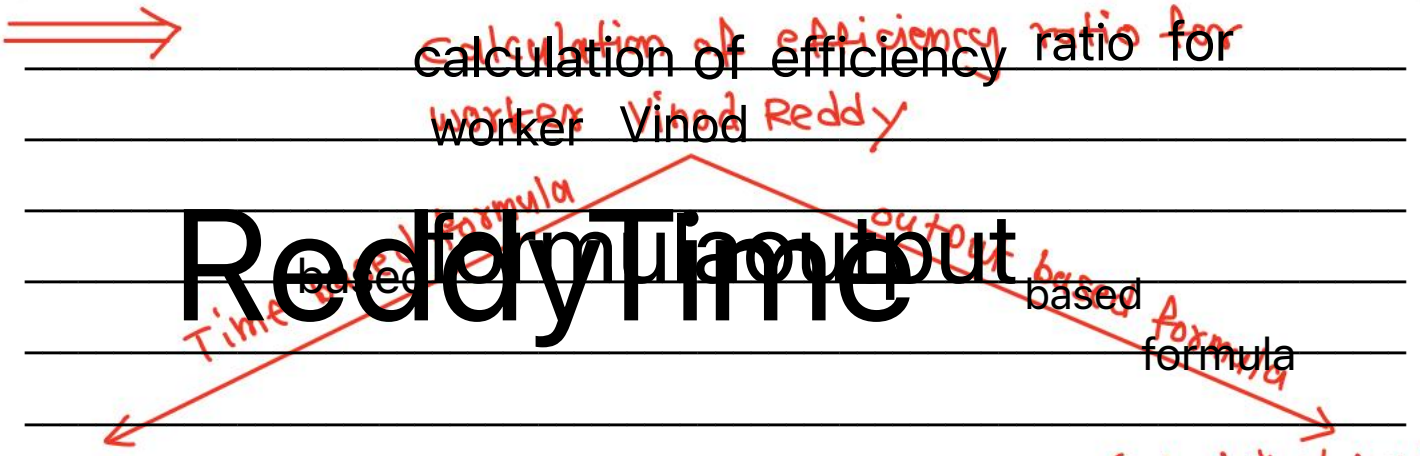
= [Actual output / (Actual time taken / Std time p.u.)] × 100 = (Actual output / Std. output × 100)

= [200 units / (50 hrs / 1/3 hrs p.u.)] × 100

= (200 units / 150 units) × 100 = 133.3333% OR 133 1/3 %

Question 24:

Standard Time per Unit of Output = 5 Hrs
Actual time taken by Worker Vinod Reddy to produce 125 Units = 1000 hrs
Find Efficiency Ratio of Worker Vinod Reddy.



Standard time = Standard time p.u. × Actual output

= 5 hrs × 125 units

= 625 hrs

Actual time taken = 1000 hrs

Efficiency ratio = (Standard time / Actual time) × 100

= (625 hrs / 1000 hrs) × 100

= 62.50%

Standard output = (Actual time taken / Standard time p.u.)

= (1000 hrs / 5 hrs p.u.)

= 200 units

Efficiency ratio = (Actual output / Std. output) × 100

= (125 units / 200 units) × 100

= 62.50%

Efficiency Ratio	Time	Output
100%	(Actual time) = (Standard time)	(Actual output) = (Standard output)
More Than 100%	(Actual time) < (Standard time)	(Actual output) > (Standard output)
Less Than 100%	(Actual time) > (Standard time)	(Actual output) < (Standard output)

Question 25:

Budgeted time for the year = 5000 Hrs
Budgeted Output for the year = 2000 units
Actual Time taken for the year = 5800 Hrs
Actual Output for year = 3000 units
Find Efficiency Ratio?

Budgeted has = std has p.u. × Budgeted output

standard has = std has p.u. × actual output

① Budgeted has = std has p.u. × Budgeted output

5000 hrs = std time × 2000 units

∴ standard time per unit = (Budgeted time / Budgeted output)

= (5000 hrs / 2000 units) = 2.50 hrs

② Efficiency ratio = (Standard time / Actual time) × 100 = (Time allowed / Time taken) × 100

= (standard time p.u. × actual output / Actual time) × 100

= (2.50 hrs × 3000 units / 7500 hrs) × 100

= 129.3103448275 %

OR

Effi. ratio = (Actual output / Standard output) × 100 = [3000 units / (Actual time taken / std time p.u.)] × 100

= 3000 units / (7500 hrs / 2.50 hrs p.u.) × 100 = 129.3103448275 %

Question 26:

Standard Time per Unit of Output = 10 Mins
Actual Output = 2500 Units
Actual time taken taken = 300 Hrs
Find Efficiency Ratio, Time saved by the Worker

Question 27:

Standard Time per unit of output = 2 hours
Actual output = 3,000 units Actual time taken = 4,500 hours. Find Efficiency Ratio.

Question 28:

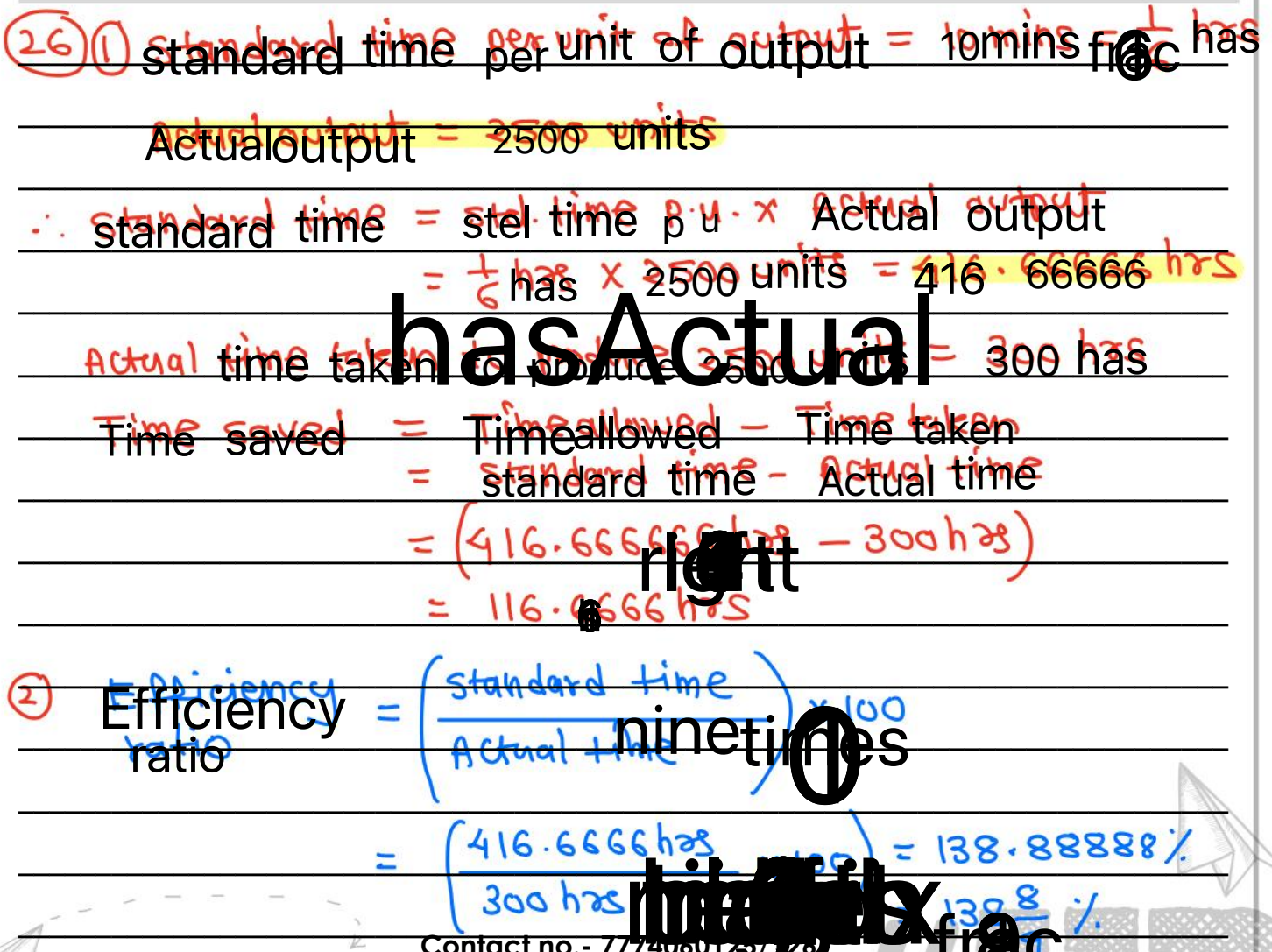
Standard Time for 10 units of output = 5 hours
Actual time for 20000 units = 8000 hours
Find Efficiency Ratio.

Question 29:

Standard time per unit of output = 10 minutes
Actual output in 2000 hours = 20000 units
Find Efficiency Ratio

Question 30:

Standard time per 1000 units = 1500 hours
Actual output in 20000 hours = 10000 units
Find Efficiency Ratio



27

Efficiency ratio = $\frac{\text{Standard time}}{\text{Actual time}} \times 100$

$= \frac{\text{Std. time p.u.} \times \text{Actual output}}{\text{Actual time}} = \frac{2 \text{ hrs} \times 3000 \text{ units}}{6000 \text{ hrs}} \times 100 = 100\%$ (i.e. $133\frac{1}{3}\%$)

28

Efficiency ratio = $\left(\frac{\text{Actual output}}{\text{Standard output}} \text{ in terms of time}\right)$

$= \frac{20{,}000 \text{ units}}{(\text{Actual time taken} / \text{std. time p.u.})} \times 100 = \frac{20{,}000 \text{ units}}{(8000 \text{ hrs} / 0.50 \text{ hr})} \times 100$

$= \frac{20{,}000 \text{ units}}{16{,}000 \text{ units}} \times 100 = 125\%$

Std. time for 10 units of output = 5 hrs

$\therefore$ Std. time for 1 unit of output $= \left(\frac{5}{10}\right) \text{hrs} = 0.50 \text{ hrs}$

29

Efficiency ratio = $\frac{\text{Standard time}}{\text{Actual time}} \times 100$

$= \frac{\text{Std. time p.u.} \times \text{Actual output}}{\text{Actual time}} = \frac{\frac{1}{3} \text{ hrs} \times 20{,}000 \text{ units}}{6666.66666 \text{ hrs}} \times 100 = 100\%$

$= \left(\frac{3333.33333 \text{ hrs}}{6666.66666 \text{ hrs}} \times 100\right) = 50\%$ (i.e. $166\frac{2}{3}\%$)

30

Standard time for 1000 units = 1500 hrs

$\therefore$ Standard time for 1 unit = 1.5 hrs

$\therefore$ Standard time for actual output of 10,000 units = $10{,}000 \times 1.50$ hrs

$= 15{,}000$ hrs

Efficiency ratio = $\frac{\text{Standard time}}{\text{Actual time}} \times 100$

$= \left(\frac{15{,}000 \text{ hrs}}{20{,}000 \text{ hrs}} \times 100\right) = 75\%$

Wage Remuneration Schemes

There are 4 wage remuneration schemes currently in our syllabus :
i) Time rate scheme
ii) ordinary/straight piece rate scheme
iii) Halsey's premium plan.
iv) Rowan's premium plan.

① Time rate scheme

Total wages as per time rate scheme = (No. of hrs worked × wage Rate per hour)

= (No. of days worked × wage rate per day)

② ordinary piece rate scheme

Total wages as per ordinary piece rate scheme = (No. of units produced × ordinary piece rate per unit)

③ Halsey's premium plan : It is a guaranteed wage scheme. (Incentive scheme)

(Total wages as per Halsey's plan) = Basic time wages + Incentive Bonus

= (No. of hrs worked × Rate per hr) + 50% (Time saved × Rate per hour)

Where Time saved = Time allowed − Time taken
= standard time − Actual time

④ Rowan's premium plan :

Total wages as per Rowan's premium plan = Basic time wages + Incentive bonus

= (Hrs worked × Rate per hour) + [Time saved / Time allowed × Basic time wages]

= (Hrs worked × Rate) + [Time saved / Time allowed × (Hrs worked × Rate)]

Question : From following data, calculate total wages payable to worker - A as per Time rate, piece rate schemes.

standard time p.u. of output = 2 hrs

No. of units produced by worker A = 800 units

Actual time taken = 1200 hrs

Basic wage rate = ₹ 80 per hour

① Total wages payable to worker A as per Time rate scheme

= (Hrs worked × Rate per hour) = 1200 hrs × ₹ 80

= ₹ 96,000/-

② Total wages payable to worker A as per piece rate scheme

= (No. of units produced × ordinary piece rate p.u.)

= 800 units × ₹ 160 = ₹ 1,28,000/-

Working Note

ordinary piece rate p.u. = (wages per hour × std. hasp.us)

= ₹ 80 × 2 hrs = ₹ 160 per unit

Question 31:

Standard Time per unit = 2 Hrs
Actual time taken by Mr. A to produce 30 units = 40 Hrs
Basic Wage rate = ₹ 100/hr
Calculate total wages payable to Mr. A as per
1. Time rate
2. Piece rate
3. Halsey's Premium Plan
4. Rowan's Premium Plan

(1) i) ordinary piece rate p.u. = wages per hour x std.hrs p.u.
= ₹100 x 2hrs = ₹200 p.u.

ii) Time saved = Time allowed − Time taken
= (std time p.u. x Actual units) − Time taken
= (2hrs x 30units) − 40hrs
= 60hrs − 40hrs = 20hrs

(2) calculation of Total wages under
i) Time rate scheme = (Hrs worked x wage rate per hour)
= 40hrs x ₹100 = ₹4,000/-

ii) piece rate scheme = (No. of units produced x ordinary piece rate p.u.)
= 30 units x ₹200 = ₹6,000/-

iii) Halsey's premium plan
= (Hrs worked x Rate per hr) + 50% (Time saved x Rate per hr)
= (40hrs x ₹100) + 50% (20hrs x ₹100)
= ₹4,000 + ₹1,000 = ₹5,000/-

iv) Rowan's premium plan
= (Hrs worked x Rate per hr) + (Time saved / Time allowed x Basic Time Wages)
= (40hrs x ₹100) + (20hrs / 40hrs x ₹4000)
= ₹4,000 + ₹1,333.3333 = ₹5,333.33333

Note : Halsey's premium plan, Rowan's premium plan are incentive schemes with guaranteed time wages

Question 32:

Question on How to convert time rate into piece rate

Basic Time wages = ₹ 600 per hour
Standard Time per unit = 20 mins = (1/3) hrs = Time allowed per unit
Calculate ordinary piece rate per unit.

1 ordinary piece rate per unit = (Wages per hr x std hrs p.u.)

= ₹600 x (1/3 hrs) = ₹200 overline

OR

ordinary piece rate per unit = (Wages per hour / Standard output in one hour)

= (₹600 / 3 units) = ₹200 p.u. overline

Question 33:

Standard time for 1 unit of output = 30 minutes = ½ hrs = 0.50 hrs

Wage Rate per hour = ₹600

Workers	Hours Worked	Actual Output
A	12 hours	30 units
B	14 hours	40 units
C	9 hours	12 units

Find Total wages of all workers as per
a) Time Rate b) Halsey Plan
c) Piece Rate d) Rowan's Plan

① Basic data

workers	Hrs worked	Actual output	Standard time allowed	Time saved	ordinary piece rate p.u.
A	12 hrs	30 units	0.50 x 30 = 15 hrs	3 hrs	₹600 x 0.50 hrs = ₹300
B	14 hrs	40 units	0.50 x 40 = 20 hrs	6 hrs	₹300
C	9 hrs	12 units	0.50 x 12 = 6 hrs	—	₹300

② calculation of Total wages under :

i) Time rate scheme = (Hrs worked x Rate per hr)

A : 12 hrs x ₹600 = ₹7,200/-

B : 14 hrs x ₹600 = ₹8,400/-

C : 9 hrs x ₹600 = ₹5,400/-

ii) ordinary piece rate scheme = (No of units produced x ordinary piece rate p.u.)

A : 30 units x ₹300 = ₹9,000/-

B : 40 units x ₹300 = ₹12,000/-

C : 12 units x ₹300 = ₹3,600/-

iii) Halsey's premium plan = (Hrs worked x Rate per hr) + 50% (Time saved x Rate per hr)

A : (12 hrs x ₹600) + 50% (3 hrs x ₹600) = ₹8,100/-

B : (14 hrs x ₹600) + 50% (6 hrs x ₹600) = ₹10,200/-

C : (9 hrs x ₹600) + 50% (—) = ₹5,400/-

iv) Rowan's premium plan = (Hrs worked x Rate per hr) + (Time saved / Time allowed x Basic time wages)

A : (12 hrs x ₹600) + (3 hrs / 6 hrs x ₹7200) = ₹8,640/-

B : (14 hrs x ₹600) + (6 hrs / 8 hrs x ₹8400) = ₹10,920/-

C : (9 hrs x ₹600) + (—) = ₹5,400/-

Question 34:

Standard Time per unit = 5 Hrs
Actual time taken by Mr. A to produce 30 units = 100 Hrs
Basic Wage rate = ₹1000/hr
Calculate total wages payable to Mr. A as per
1. Time rate
2. Piece rate
Also calculate Efficiency Ratio for Mr. A

(1) ordinary piece rate p.u.
= (Wages per hour × standard hrs p.u.)
= ₹1000 × 5 hrs = ₹5000/-

(2) Total wages payable to Mr A as per Time rate scheme
= (Hrs worked × Rate per hr)
= 100 hrs × ₹1000 = ₹1,00,000/-

(3) Total wages payable to Mr A as per ordinary piece rate scheme
= No. of units produced × ordinary piece rate p.u.
= 30 units × ₹5000 = ₹1,50,000/-

(4) Efficiency ratio for Mr A
= Standard time / Actual time = std. time p.u. × actual output / actual time
= (5 hrs × 30 units) / 150 hrs = 150 hrs / 150 hrs = 1.50 (i.e. 150%)

Please note that :
(Total wages as per Time rate scheme) × Efficiency = (Total wages as per ordinary piece rate scheme)

(Total wages as per time rate scheme) x Efficiency ratio

= (Hrs worked) x (Rate per hour) x (Std. time p.u. x actual output / Actual time)

= (wages per hr x std. hrs p.u.) x No. of units produced

= ordinary piece rate p.u. x No. of units produced

= Total wages as per ordinary piece rate scheme

Question 35:

Standard Time per unit = 15 Mins = 0.25 hrs = ¼ hrs
Actual time taken by Mr. A to produce 200 units = 20 Hrs
Basic Wage rate = ₹300/hr
Calculate total wages payable to Mr. A as per
1. Time rate
2. Piece rate
3. Halsey's Premium Plan
4. Rowan's Premium Plan
Also calculate Efficiency Ratio and Effective Wage Rate per hour under Halsey & Rowan's Plan.

① Total wages as per Time rate scheme

= Hours worked x Rate per hour

= 20 hrs x ₹300 = ₹6,000

② Total wages as per ordinary piece rate scheme

= No. of units produced x ordinary piece rate p.u.

= 200 units x (wages per hr x std. hrs p.u.)

= 200 units x (₹300 x ¼ hrs) = 200 units x ₹75 p.u.

= ₹15,000

③ Total wages as per Halsey's premium plan

= (Hrs worked x Rate per hr) + 50% (Time saved x Rate per hr)

= (20 hrs x ₹300) + 50% [(Time allowed − Time taken) x Rate per hr]

= ₹6000 + 50% [(Std. time p.u. x actual output − Time taken) x ₹300]

(4) Effective wage rate per hour under Halsey's plan

$= \left(\frac{\text{Total wages payable}}{\text{Hrs worked}}\right) = \frac{₹\,10,500}{20\text{ hrs}} = ₹\,525 \text{ per hour}$

(5) Total wages as per Rowan's premium plan

$= (\text{Hrs worked} \times \text{Rate per hr}) + \left(\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Basic time wages}\right)$

$= (20\text{ hrs} \times ₹\,300) + \left(\frac{30\text{ hrs}}{50\text{ hrs}} \times ₹\,6000\right)$

$= ₹\,9600/-$

(6) Effective wage rate per hour under Rowan's scheme

$= \left(\frac{\text{Total wages payable}}{\text{Hrs worked}}\right) = \left(\frac{₹\,9,600}{20\text{ hrs}}\right) = ₹\,480 \text{ per hour}$

(7) Efficiency ratio for Mr. A

$= \left(\frac{\text{Standard time}}{\text{Actual time}} \times 100\right) = \frac{50\text{ hrs}}{20\text{ hrs}} \times 100 = 250\%$

OR

$= \left(\frac{\text{Actual output}}{\text{Standard output}} \times 100\right) = \frac{200\text{ units}}{80\text{ units}} \times 100 = 250\%$

OR

Total wages as per Time rate scheme × Efficiency ratio = Total wages as per Rowan's scheme

₹ 6000 × Efficiency = ₹ 15,000

Question 36:

Standard time for 4 units of output = 8 hours
Basic Wage Rate = ₹3,000 per hour

Workers	Hours Worked	No. of units produced
A	50 hours	35 units
B	40 hours	30 units
C	35 hours	10 units
D	46 hours	32 units
E	56 hours	10 units

Find Total Wages of all workers as per 1. Halsey's Plan 2. Rowan's Plan

① Key-data

Workers	Actual time taken	No. of units produced (Actual output)	Standard time for Actual output	Time saved
A	50 hrs	35 units	35 × 2 = 70 hrs	20 hrs
B	40 hrs	30 units	30 × 2 = 60 hrs	20 hrs
C	35 hrs	10 units	10 × 2 = 20 hrs	—
D	46 hrs	32 units	32 × 2 = 64 hrs	18 hrs
E	56 hrs	10 units	10 × 2 = 20 hrs	—

Estandard time p.u. of output = (8 hrs / 4 units) = 2 hrs

② calculation of total wages as per Halsey's scheme

= (Hrs worked × Rate per hr) + 50% (Time saved × Rate per hr)

A : (50 hrs × ₹3000) + 50% (20 hrs × ₹3000) = ₹1,80,000/-
B : (40 hrs × ₹3000) + 50% (20 hrs × ₹3000) = ₹1,50,000/-
C : (35 hrs × ₹3000) + 0 = ₹1,05,000/-
D : (46 hrs × ₹3000) + 50% (18 hrs × ₹3000) = ₹1,65,000/-
E : (56 hrs × ₹30) + 50% (20 hrs × ₹3000) = ₹ 1,68,000/-

Workers	Hrs worked	× Rate per hr	+ 50% Time saved	× Rate per hr
A	50 hrs	× 2	20 hrs	× 3000
B	40 hrs		20 hrs	× 3000
C	35 hrs		0	
D	46 hrs		18 hrs	× 3000
E	56 hrs	× 30	20 hrs	× 3000

Workers				
A	50 hrs	× 3000	=	₹1,80,000
B	40 hrs	× 3000	=	₹1,50,000
C	35 hrs	× 3000	=	₹1,05,000
D	46 hrs	× 3000	=	₹1,65,000
E	56 hrs	× 30	=	₹ 1,68,000

③ calculation of Total wages as per Rowan's plan

= (Hrs worked × Rate per hr) + (Time saved / Time) × Basic time wages

A : (50 hrs × ₹3000) + (20 hrs / 2 hrs) × ₹3000 = ₹1,92,857
B : (40 hrs × ₹3000) + (20 hrs / 2 hrs) × ₹3000 = ₹1,20,000
C : (35 hrs × ₹3000) + 0 = ₹1,05,000
D : (46 hrs × ₹3000) + (18 hrs / 2 hrs) × ₹3000 = ₹1,38,000
E : (56 hrs × ₹30) + 0 = ₹1,68,000

Workers				
A	50 hrs	× 3000	=	₹1,92,857
B	40 hrs	× 3000	=	₹1,20,000
C	35 hrs	× 3000	=	₹1,05,000
D	46 hrs	× 3000	=	₹1,38,000
E	56 hrs	× 30	=	₹1,68,000

Question 37:

Standard time for one unit of output = 15 minutes
Actual time taken by workers to produce 2000 units = 350 hours
Normal wage rate = ₹100 per hour
Find total wages as per -
a) Time Rate
b) Halsey's Premium Plan
c) Piece Rate
d) Rowan's Plan

① calculation of Total wages under

i) Time rate scheme = (Hrs worked × wage rate per hour)
= 350 hrs × ₹100 = ₹35,000

ii) piece rate scheme = (Total wages as per Time rate scheme × Efficiency ratio)
= ₹35,000 × 142.85714285714 % = ₹50,000/-

iii) Halsey's premium plan = (Hrs worked × Rate per hr) + 50% (Time saved × Rate per hr)
= (350 hrs × ₹100) + 50% (150 hrs × ₹100) = ₹42,500/-

iv) Rowan's premium plan = (Hrs worked × Rate per hr) + (Time saved / Time allowed × Basic time wages)
= (350 hrs × ₹100) + (150 hrs / 500 hrs × ₹35,000)
= ₹35,000 + ₹10,500 = ₹45,500/-

② i) Efficiency ratio = (standard time p.u. × Actual output / Actual time)
= (15 hrs × 2000 units / 350 hrs) = (500 hrs / 350 hrs) = 142.85714285714 %

ii) Time saved = standard time − Actual time
= 500 hrs − 350 hrs = 150 hrs

Question 37:

Workers	Std. Time for 1 unit of output	Actual Time Taken (in hours)	Actual Output (units)	Basic Wage Rate per hour (₹)
A	2 hours	3000	2000	10
B	5 hours	20000	5000	12
C	3 hours	30000	8000	8
D	1.5 hours	10000	12000	6

Find total wages as per
a) Time Rate b) Halsey's Premium Plan
c) Piece Rate d) Rowan's Plan

(1) Key data

workers	Std time p.u hrs	Actual time taken hrs	Actual output units	Standard for actual output hrs	Time saved	Basic wage rate per hr (₹)	ordinary piece rate p.u (₹)
A	2	3,000	2,000	4,000	1,000	10	20
B	5	20,000	5,000	25,000	5,000	12	60
C	3	30,000	8,000	24,000	—	8	24
D	1.5	10,000	12,000	18,000	8,000	6	9

ordinary piece rate p.u = (wages per hr × std. hrs p.u)

(2) Calculation of Total wages under :

i) Time rate scheme = (Hrs worked × Rate per hour)

workers				
	A	3000 hrs	× 10	= ₹ 30,000/-
	B	20,000 hrs	× 12	= ₹ 2,40,000/-
	C	30,000 hrs	× 8	= ₹ 2,40,000/-
	D	10,000 hrs	× 6	= ₹ 60,000/-

ii) Halsey's scheme = (Hrs worked × rate per hr) + 50% (Hrs saved × rate per hr)

workers					
	A	3000 hrs	× 10	+ 50% (1000 hrs	× 10) = ₹ 35,000/-
	B	20,000 hrs	× 12	+ 50% (5000 hrs	× 12) = ₹ 2,70,000/-
	C	30,000 hrs	× 8	+ 0	= ₹ 2,40,000/-
	D	10,000 hrs	× 6	+ 50% (8000 hrs	× 6) = ₹ 84,000/-

iii) ordinary piece rate scheme = (No of units produced × Rate p.u)

workers				
	A	2000 units	× 20	= ₹ 40,000/-
	B	5,000 units	× 60	= ₹ 3,00,000/-
	C	8,000 units	× 24	= ₹ 1,92,000/-
	D	12,000 units	× 9	= ₹ 1,08,000/-

iv) Rowan's premium plan = (Hrs worked × Rate) + (Time saved / Time allowed × Basic time × Wages)

A : (3000 hrs × ₹10) + (3000/4000) × 30,000 = ₹37,500/-

B : (20,000 hrs × ₹12) + (5000/5000) × 2,40,000 = ₹2,88,000/-

C : (30,000 hrs × ₹8) + 0 = ₹2,40,000/-

D : (10,000 hrs × ₹6) + (2000/10000) × 60,000 = ₹86,667/-

Question 38:

Standard output in 1 hour = 5 units
Actual output in 28 hours = 280 units
Find effective wage rate per hour as per: Halsey Scheme and Rowan's Scheme.
Basic Wage Rate = ₹200 per hour

(1) Calculation of Time saved, Time allowed

Time saved = Time allowed − Time taken

= (Std. time p.u. × Actual output) − Time taken

= (1/5 hrs × 280 units) − 28 hrs

= 56 hrs − 28 hrs = 28 hrs

(2) Total wages as per Halsey's scheme

= (Hrs worked × Rate per hr) + 50% (Time saved × Rate per hr)

= (28 hrs × ₹200) + 50% (28 hrs × ₹200)

= ₹5,600 + ₹2,800 = ₹8,400

∴ Effective wage rate per hour under Halsey's scheme = (Total wages payable / Hrs worked)

= (₹8,400 / 28 hrs) = ₹300/-

Note :

As Time saved is exactly equal to 50% of Time allowed Incentive under both the schemes will be same.

(3) Total wages as per Rowan's scheme

= (Hrs worked × Rate per hr) + (Time saved / Time allowed × Basic time wages)

= (28 hrs × ₹ [illegible]) + (28 hrs / [illegible] hrs × ₹5,600)

= ₹5,600 + ₹ [illegible] = ₹8,400/-

∴ Effective wage rate per hour under Rowan's scheme = (Total wages payable / Hrs worked)

= (₹8,400 / 28 hrs) = ₹300/-

Question 39:

Standard Time for a job is 80 hours. The hourly rate of guaranteed wage is ₹100 per hour. Because of saving in time, Mr. A gets an hourly rate of total age at ₹125 per hour under Rowan's Scheme. For the same saving in time, calculate hourly rate of wages under Halsey's Scheme.

(1) Let time taken by Mr A to complete the job be 'x' hours

∴ Time saved = (Standard time − Actual time) = (80 − x) hrs

[Effective wage rate per hour under Rowan's plan] = [(Hrs worked × Rate per hr) + (Time saved / Time allowed × Basic time wages × Rate per hr)] / Hrs worked

125 = [(x × 100) + ((80 − x) / 80 × 100x)] / 80

125 × 80 = 100x + (80 − x) × 1.25x

10000 = 100x + 100x − 1.25x²

1.25x² − 200x + 10000 = 0

x² − 160x + 8000 = 0

x = 80 hrs

∴ Time taken by worker A to complete the job = 80 hrs

∴ Time saved by worker A = (80 − x) hrs = 0 hrs

(2) Total wages payable for same saving in time under Halsey's plan

= (Hrs worked × Rate per hr) + 50% (Time saved × Rate per hr)

= (60 hrs × ₹100) + 50% (6 hrs × ₹100) = ₹7000/-

(3) Effective wage rate per hour under Halsey's plan

= (Total wages payable / Hours worked) = (₹7000 / 60 hrs) = ₹116.66666

Question 40:

Standard Time for a job is 90 hours. The hourly rate of guaranteed wages is ₹50. Because of saving in time, Worker A gets an effective hourly rate of ₹60 under Rowan Premium Bonus System. For the same saving in time, calculate the hourly rate of wages that Worker B will get under Halsey Premium Bonus System, assuming 40% to worker.

(1) Let Actual time taken to complete the job be 'x' hours

∴ Time saved = (Standard time − Actual time) = (90 − x) hrs

$$\text{Effective wage rate per hour under Rowan's plan} = \frac{\text{Total wages payable as per Rowan's plan}}{\text{Hrs worked}}$$

$$₹60 = \frac{[(\text{Hrs worked} \times \text{Rate per hr}) + (\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Basic time} \times \text{Wages rate})]}{x}$$

$$60x = (x \times 50) + \left(\frac{90-x}{90} \times 50x\right)$$

$$60x - 50x = (90-x) \times \frac{5}{9}x$$

$$10x = (90-x) \times \frac{5x}{9}$$

$10x \times \frac{9}{10} = 90 - x$

$18 = 90 - x$

$\therefore$ Time taken to complete the job = 72 hrs

Time saved = (90 − x) hrs = (90 − 72) hrs = 18 hrs

② Halsey's plan

i) Total wages for same saving in time = (Hrs worked × Rate per hr) + 40% (Time saved × Rate per hr)

= (72 hrs × ₹50) + 40% (18 hrs × ₹50) = ₹3600 + ₹360

= ₹3960/-

ii) Effective wage rate per hour = $\left(\frac{\text{Total wages payable}}{\text{Hrs worked}}\right) = \frac{₹3,960}{72 \text{ hrs}}$

= ₹55/- per hour

Question 41:

A skilled worker is paid a guaranteed wage rate of ₹120 per hour. The standard time allowed for a job is 6 hours. He took 5 hours to complete the job. He is paid wages under Rowan Incentive Plan.

a. Calculate his effective hourly rate of earnings under Rowan Incentive Plan.

b. If the worker is placed under Halsey incentive scheme (50%) and he wants to maintain the same effective hourly rate of earnings, calculate the time in which he should complete the job.

① Time allowed = 6 hrs, Time taken = 5 hrs

$\therefore$ Time saved = (Time allowed − Time taken) = (6 hrs − 5 hrs) = 1 hour

(Total wages payable as per Rowan's plan) = (Hrs worked × Rate per hr) + (Time saved / Time allowed × Basic Time wages)

= (5 hrs × ₹120) + (1 hr × ₹600) = ₹700/-

(Effective wage rate per hour under Rowan's plan) = (Total wages payable / Hrs worked) = ₹700 / 5 hrs = ₹140

② Let the worker completes the job in 'x' hours in order to maintain same effective rate of earning of ₹140 under Halsey's scheme.

Effective earning per hour under Halsey's plan = (Hrs worked × Rate per hr) + 50% (Time saved × Rate per hr) / Hrs worked

$$140 = \frac{(x \times 120) + [0.50(6-x) \times ₹120]}{x}$$

$$140x = 120x + 60(6-x)$$

$$20x = 360 - 60x \quad \therefore 80x = 360 \quad \therefore x = 4.50 \text{ hrs}$$

Worker need to complete the job in 4.50 hrs in order to earn effective rate of ₹140 per hour under Halsey's plan.

Question 42:

The Accountant of the company had computed Labour Turnover Rates for the quarter ended 30th September as 14%, 8%, and 6% under Flux, Replacement and Separation Methods respectively. If the number of workers replaced during the said quarter of the year is 36. Find (a) Number of workers recruited and joined and (b) Number of workers left and discharged. Also calculate equivalent labour turnover rates for the year.

① (Labour turnover ratio under replacement method) = (No. of workers replaced during the quarter / Avg. No. of workers on Roll during the quarter) × 100 times

$$0.08 = \frac{36}{\text{Avg. No. of workers on Roll during the quarter}}$$

Avg. No. of workers on Roll during the quarter = 36 / 0.08 = 450

② (Labour turnover ratio under separation method) = (No. of workers left & discharged during the quarter / Avg. No. of workers on Roll during the quarter) × 100 times

No. of workers left & discharged during the quarter = 450 × 6% = 27

③ Labour turnover ratio by Flux method = (No. of workers left & discharged during the quarter + No. of workers recruited & joined during the quarter) / Avg. no. of workers on roll during the quarter

0.14 = (27 + No. of workers recruited & joined during the quarter) / 450

No of workers recruited & joined during the quarter = (450 × 0.14) − 27 = 36 − 27 = 9

④ Equivalent labour turnover rate by Flux method = (0.14 / 1 quarter) × 4 quarters = 0.56 = 56%

Replacement method = (0.08 / 1 quarter) × 4 quarters = 0.32 = 32%

Separation method = (0.06 / 1 quarter) × 4 quarters = 0.24 = 24%

Question 43:

A skilled worker in XYZ Ltd is paid a guaranteed wage rate of ₹30 per hour. The standard time per unit of a particular product is 4 hours. Mr. P a workman has been paid wages under Rowan's scheme and he had earned effective hourly rate of ₹37.50 on manufacture of a particular product.
What could have been his total earning and effective hourly rate, had he been put on Halsey's scheme with 50% Bonus?

⟹ ① Let actual taken by workman Mr. P to complete the product be 'x' hours for which time allowed is 4 hours

∴ Time saved = Time allowed − Time taken = (4 − x) hrs

Effective wage rate per hour under Rowan's scheme = (Total wages payable / Hrs worked)

₹ 37.50 = [(Hrs worked × Rate) + (Time saved / Time allowed × Basic time)] / x

D

$37.50x = \left(x \times 30\right) + \left(\frac{4-x}{4} \times 30x\right)$

$7.50x = \left(\frac{4-x}{4} \times 30x\right) \quad \left(\frac{7.50x \times 4}{30x}\right) = 4-x$

$1 = 4-x \quad \therefore \quad x = 3$ hours = Time taken to complete product

therefore Time saved = 4 − 3 = 1 hour

② Total wages payable as per Halsey's plan for same saving in time

= (Hrs worked × Rate per hr) + 50% (Time saved × Rate per hour)

= (3 hrs × ₹30) + 50% (1 hour × ₹30) = ₹105/-

Effective wage rate per hour under Halsey's plan = $\frac{₹105}{3} = ₹35$

Question 44:

Standard time for one unit of output = 3 hours
Actual output of Worker (A) = 200 units
Actual output of Worker (B) = 300 units
Time taken by Worker (A) = 450 hours
Time taken by Worker (B) = 750 hours
Basic Wage Rate = ₹100 per hour
Find total wage as per
1) Time Rate 2) Piece Rate
3) Halsey's Plan 4) Rowan's Plan

① key-data

Workers	Standard time p.u. (Hrs)	Actual output (units)	Standard time for actual output (Hrs)	Actual time taken (Hrs)	Time saved (Hrs)	Ordinary piece rate p.u. = Wages per hr × Std. hrs
						= ₹100 × 3 hrs
A	3	200	600	450	150	₹300
					(600−450)	
B	3	300	900	750	150	₹300
			(300 × 3 times)		(900−750)	

2 calculation of Total wages under :

① Time Rate scheme

Total wages = Has worked × Rate per hr

A : 450 has × ₹100 = ₹45,000/-

B : 750 has × ₹100 = ₹75,000/-

② piece rate scheme

Total wages = (No. of units produced × ordinary piece rate)

A : 200 units × ₹300 = ₹60,000/-

B : 300 units × ₹300 = ₹90,000/-

③ Halsey's premium plan

Total wages = (Has worked × Either rate per hr) + 50% (time saved × rate per hr)

A : ₹45,000 + 50% (450 has × ₹100) = ₹52,500

B : ₹75,000 + 50% (750 has × ₹100) = ₹82,500

④ Rowan's premium plan

Total wages = (Has worked × Rate per hr) + (Time saved / Time allowed) (Basic time wages)

A : ₹45,000 + (150/600) × 45,000 = ₹56,250/-

B : ₹75,000 + (150/600) × 75,000 = ₹87,500/-

Question 45:

The management of Zenith Co. Ltd. are worried about their increasing labour turnover in their factory and before analyzing the causes, they want to have an idea of the profit foregone as a result of labour turnover in the last year.

Last year sales amounted to ₹83,03,300 and the PV ratio is 1/5. The total number of actual hours worked by the direct labour force was 4.45 lakhs. As a result of delays by personnel department in filling up the vacancies due to labour turnover, 60,000 potentially productive hours were not worked. The actual direct labour hours included 30,000 hours attributable to training new recruits, out of which half of the hours were unproductive.

The costs consequent on labour turnover revealed on analysis the following:

	₹
Settlement Costs due to leaving	43,250
Recruitment costs	34,520
Selection and placement costs	42,610
Training costs	69,270
Total	**1,89,650**

Assuming that the potential production lost as a consequence of labour turnover could have been sold at the prevailing prices, find out the profit foregone last year as a result of labour turnover.

① Analysis of Labour hrs for the last year

5,05,000 potentially productive labour hours

Hours worked = 4,45,000

Hrs lost due to delays in filling up the vacancies by personnel dept = 60,000 Hrs

4,15,000 = productive labour hours

30,000 = Hrs spent on training new recruits

15,000 = productive hours

15,000 = unproductive hours

Total productive labour hours in last year = 4,15,000 + 15,000 = 4,30,000

Total unproductive labour hours = 60,000 + 15,000 = 75,000/-

(2) Statement showing calculation of profit foregone on account of labour turnover in the last year

particulars	Amt (₹)
(a) sales for the last year	83,03,300
(b) p/v ratio	1/5 = 0.20 = 20%
(c) contribution earned in last year by working for 4,30,000 productive hours (a×b)	16,60,660
(d) contribution per labour hour (c/4,30,000 hrs)	3.862
(e) contribution foregone on 60,000 potentially productive has lost due to delays in filling up the vacancies (60,000 hrs × ₹3.862)	2,31,720
(f) contribution foregone 15,000 unproductive hours spent training new recruits (15,000 hrs × ₹3.862)	57,930
(g) settlement cost due to leaving	43,250
(h) recruitment cost	34,520
(i) selection and placement costs	42,610
(j) Training costs	69,270
(k) Total profit foregone on account of labour turnover in last year (e+f+g+h+i+j)	4,79,300/-

Question 46:

Basic Wage rate = ₹100/hr
For time spent of more than 8 hrs per day worker gets overtime premium of 100%
Worker A has worked for 13 hrs in a day.
Calculate:
1. Total Wages payable to Mr. A for the day
2. Overtime wages payable, Overtime premium payable to Mr. A

(1) Normal wages per hour = ₹100
overtime premium per hour = ₹100 x 100% = ₹100
∴ Total overtime wages per hour = ₹100 + ₹100 = ₹200

(2) Total wages payable to Mr. A for the day
= (8 hrs x ₹100) + (5 hrs x ₹200)
OR
= (13 hrs x ₹100) + (5 hrs x ₹100)
= ₹1800/-

(3) overtime wages payable = (13 hrs - 8 hrs) x ₹200 per hour
= ₹1000/-

(4) overtime premium payable = 5 hrs x ₹100 per hour
= ₹500/-

What is Overtime? What are the causes and effects of Overtime?

1. Time spent by workers over & above normal working hours is known as overtime. Generally overtime is paid at double rate (OR higher rate)

overtime wages = (Normal time + overtime premium)

suppose normal wage rate is ₹800 per hour & overtime wages are ₹1600 per hour then we can say that overtime premium is ₹800 per hour.

2. causes of overtime :

i) Geniane labour shortage in the industry
ii) unexpected / unanticipated developments (sudden increase in demand)
iii) customer's requirement for urgent delivery
iv) Abnormal reasons like machine breakdowns, accidents, Fire etc
v) Fault of the department

3. Effects of overtime

overtime involves extra cost and overtime premium paid to workers increases cost of production in following ways :

i) overtime premium paid is extra payment in addition to normal wages
ii) Efficiency of operators during overtime hours may fall hence it increases labour cost P.u
iii) in order to earn more, workers may not concentrate on work during normal working hours and standard output during normal working may also come down
iv) reduced output & Increased cost (premium) will bring overall increase in cost of production

overtime should be preferred only when it is extremely essential

department3

What is the difference between Job Evaluation & Merit Rating?

Job evaluation	Merit rating
1) It is the process of determining relative worth of different jobs	1) It is the process of determing relative worth of persons associated with organisation
2) It is carried out with the intention to resign wage structure (i.e salary structure.	2) It is carried out with an intention to decide promotions, transfers, appreciation of employee etc
3) A uniform & fair wage structure is devised during Job evaluation process etc	3) It ensures fair wages to the workers on the basis of their performance & merit
4) Factors considered i) Analytical & conceptual skills ii) Management & administration skillsii iii) Behavioural skills iv) Technical or physical skills etc	4) Factors considered i) Experience ii) Association with organisation (Loyalty) iii) sincerity, honesty etc iv) specialised skills v) productivity or efficiency vi) Relative importance in organisation etc

What is the difference between Casual Worker & Out Worker?

Casual worker	Out worker
① a casual worker is appointed for a short duration to carry out normal businessactivities in place of regular but temporarily absent worker	① a person who does not work in factory premises but either works at his home or at any other site outside the factory
② He is paid on time basis. He is also known as Daily wage worker or Badli worker	② An outworker is usually compensated on the basis of work he completed or output basis.
③ He is engaged for regular work inside the factory	③ He may be supplied with raw materials, necessary tools to complete the job but not inside the factory

factorycasual

regularwork

Question 47: (Important)

Total No of hrs worked = 2000 hrs (including overtime of 500 hrs)
Normal wage rate = ₹ 200 per hour
Overtime premium = 50% of Normal wage rate

Hrs spent on various jobs

	Normal	Overtime
Job A	800	300
Job B	200	200
Job C	500	-

Calculate labour cost to be allocated to Job A, Job B, Job C if

a) Overtime work is because of genuine labour shortage throughout the year
b) Overtime work is because of abnormal reasons.
c) overtime work is at request of customer to expediate the job.

① Total wages payable to workers
= normal wages + overtime premium
= (2000 hrs × ₹200) + (500 hrs × ₹100 per hr)
= ₹4,00,000 + ₹50,000 = ₹4,50,000/-

(2) Treatment for overtime premium and calculation of labour cost allocated to different jobs when :

(a) overtime work is because of geniune labour shortage throughout the year

yearInflated wage rate per hour = (Total wages payable / Total hrs worked) = (₹4,50,000 / 2000 hrs) = ₹225 per hour

∴ Labour cost allocated to
Job A : 1100 hrs x ₹225 = ₹2,47,500/-
Job B : 400 hrs x ₹225 = ₹90,000/-
Job C : 500 hrs x ₹225 = ₹1,12,500/-

(b) overtime work is because of abnormal reasons

Labour cost allocated to
Job A : 1100 hrs x ₹200 = ₹2,20,000
Job B : 400 hrs x ₹200 = ₹80,000
Job C : 500 hrs x ₹200 = ₹1,00,000

& overtime premium payable of ₹50,000 will not become part of cost of production of any of the job. ₹50,000 will be directly debited costing P & L A/C

Addi wages paid for abnormal idle time will be directly debited to wsting P & L A/C

(c) overtime work is at request of customer to expediate the job.

Labour cost allocated to
Job A : 1100 hrs x ₹200 + 300 hrs x ₹100 = ₹2,50,000/-
Job B : 400 hrs x ₹200 + 200 hrs x ₹200 = ₹1,00,000/-
Job C : 500 hrs x ₹200 = ₹1,00,000/-

Explain the treatment of Overtime premium payable in Cost Accounts.

Treatment for overtime premium is dependent on reasons for overtime work. Accounting treatment for overtime premium is as follows:

Reason for overtime work	Accounting treatment for overtime premium
(1) Due to genuine labour shortage throughout the year	Wage rate will be inflated i.e. wages payable including overtime premium has worked
(2) At a customer's specific requirement to expediate the job (urgent delivery)	overtime premium paid becomes part of regular cost of production. overtime premium will be charged to that job itself & it will be suitably recovered from that customer only
(3) overtime is because of unanticipated developments	overtime premium will be charged to Factory overheads A/c.
(4) overtime is because of a faulty Dept	overtime premium will be charged to that faulty Dept only.
(5) Abnormal reasons like Machine breakdown, Fire, power failure, strike of workers etc	overtime premium will be directly debited to costing P&L A/c. i.e. overtime premium will not inflate cost of production of any of the job but company's profit will be reduced

Question 48:

Standard Time per unit = 12 minutes
Actual time taken = 16 hours
Actual Output = 96 units
Basic Wage Rate = ₹600 per hour
Find Total Wages as per Halsey and Rowan Plans.

① calculation of Time saved & Time allowed

Time Saved = (Std time for Actual Output) − (Time taken) = (Time allowed) − (Time taken)

= (12 hrs × 96 units) − 16 hrs

= 19.20 hrs − 16 hrs = 3.20 hrs

② Halsey's premium plan

Total wages = (Hrs worked × Rate per hr) + 50% (Time saved × Rate per hr)

= (16 hrs × ₹600) + 50% (3.20 hrs × ₹600)

= ₹9600 + ₹960 = ₹10,560/-

③ Rowan's premium plan

Total wages = (Hrs worked × Rate per hr) + (Time saved / Time allowed) (Basic time wages)

= (16 hrs × ₹600) + (3.20 hrs / 19.20 hrs × ₹9600)

= ₹9600 + ₹1600 = ₹11,200/-

Here (Incentive as per Rowan's scheme) > (Incentive as per Halsey's scheme)

because (Time saved) < 50% (Time allowed)

= 24 minutes

Question 49

Standard Time per unit of output = 0.40 hours
Normal Wage Rate = ₹750 per hour
Actual Output in a week of 40 hours by Mr (A) = 125 units
Mr (B) = 85 units
Calculation of Total Wages under Halsey and Rowan schemes

① calculation of Time saved & Time allowed

workers	standard time (i.e. Time allowed)	Time taken (Hrs)	Time saved (Hrs)
A	40hrs × 125 units = 50 hrs	40	10 hrs
B	40 hrs × 85 units = 34 hrs	40	0

② Total wages under Halsey's plan

= (Hrs worked × Rate per hr) + 50% (Time saved × Rate per hr)

A : (40hrs × ₹750) + 50% (10hrs × ₹750) = ₹33,750/-

B : (40hrs × ₹750) + 0 = ₹30,000/-

③ Total wages as per Rowan's plan

= (Hrs worked × Rate per hr) + (Time saved / Time allowed) × Basic Time wages

A : (40hrs × ₹750) + (10/50) × ₹30,000 = ₹36,000/-

B : (40hrs × ₹750) + 0 = ₹30,000/-

Question 50:

Normal Working Hours in a day = 8 hours
Basic wage rate = ₹50 per hour
Beyond 8 hours worker gets the wages at double rate.
Find total wages, overtime premium for Mr. A if he has worked for 13 hours in a day.

Total wages payable to MJ A = Normal wages for normal working hours + overtime wages

= (8hrs × ₹50) + (13hrs − 8hrs) × ₹100

= ₹400 + ₹500 = ₹900

OR

overtime wages payable = ₹500

Normal wages = ₹250

overtime premium = ₹250

Total wages payable to MJ A = Normal wages + overtime premium

= (8hrs × ₹50 per hr) + (5hrs × ₹50 per hr) + ₹250 = ₹900/-

Here overtime premium is 100% of normal wage rate

Measurement of Direct Expenses

The direct expenses are measured at invoice or agreed price net of rebate or discount but includes duties and taxes (for which input credit not available), commission and other directly attributable costs.

In case of sub-contracting, where goods are get manufactured by job workers independent of the principal entity, are measured at agreed price. Where the principal supplies some materials to the job workers, the value of such materials and other incidental expenses are added with the job charges paid to the job workers.

Treatment of Direct Expences

Direct Expenses form part of the prime cost for the product or service to which it can be directly traceable and attributable. In case of lump-sum payment or one-time payment, the cost is amortised over the estimated production volume or benefit derived.

If the expenses incurred are of insignificant amount i.e. not material, it can be treated as part of overheads.

Question 51:

Aditya Ltd. is an engineering manufacturing company producing job order on the basis of specification given by the customers. During the last the month it has completed three job works namely A, B and C. The following are the items of expenditures which are incurred apart from direct materials and direct employee cost:

(i) Office and administration cost - ₹ 3,00,000.
(ii) Product blueprint cost for job A - ₹ 1,40,000
(iii) Hire charges paid for machinery used for job work B - ₹ 40,000
(iv) Salary to office attendants - ₹ 50,000
(v) One time license fee paid for software used to make computerised graphics for job C - ₹ 50,000.
(vi) Salary paid to marketing manager - ₹ 1,20,000.

Required:

CALCULATE direct expenses attributable to each job.

Solution: Calculation of Direct expenses

Particulars	Job A (₹)	Job B (₹)	Job C (₹)
Product blueprint cost	1,40,000	–	–
Hire charges paid for machinery	–	40,000	–
license fee paid for software	–	–	50,000
Total Direct expenses	1,40,000	40,000	50,000

Note:

(i) Office and administration cost is classified as overheads.

(ii) Salary paid to office attendants is classified under office and administration cost.

(iii) Salary paid to marketing manager is classified under selling overheads

Question 1 :

Answer the following:
A Ltd. Co. has capacity to produce 1,00,000 units of a product every month. It works cost at various levels of production is as under:

Level	Work Cost per unit (Rs)
10%	400
20%	390
30%	380
40%	370
50%	360
60%	350
70%	340
80%	330
90%	320
100%	310

Its fixed administration expenses amount to Rs 1,50,000 and fixed marketing expenses amount to Rs 2,50,000 per month respectively. The variable distribution cost amounts to Rs 30 per unit. It can sell 100% of its output at Rs 500 per unit provided it incurs the following further expenditure:

i. It gives gift items costing Rs 30 per unit of sale;
ii. It has lucky draws every month giving the first prize of Rs 50,000; 2nd prize of Rs 25,000, 3rd prize of Rs 10,000 and three consolation prizes of Rs 5,000 each to customers buying the product.
iii. It spends Rs 1,00,000 on refreshments served every month to its customers;
iv. It sponsors a television programme every week at a cost of Rs 20,00,000 per month.
It can market 30% of its output at Rs 550 per unit without incurring any of the expenses referred to in (i) to (iv) above.

Prepare a cost sheet for the month showing total cost and profit at 30% and 100% capacity level.

Question 2 :

A company presently sells an equipment for Rs 35,000. Increase in prices of labour and material cost are anticipated to an extent of 15% and 10% respectively, in the coming year. Material cost represents 40% of cost of sales and labour cost 30% of cost of sales. The remaining relate to overheads. If the existing selling price is retained, despite the increase in labour and material prices, the company would face a 20% decrease in the existing amount of profit on the equipment.

You are required to arrive at a selling price so as to give the same percentage of profit on increased cost of sales, as before. Prepare a statement of profit/loss per unit, showing the new selling price and cost per unit in support of your answer.

Question 3 :

The following figures are extracted from the books of Pragati Fashion Lts. for the year ended 31.3.2018.

Prepare a cost sheet showing clearly the total cost and the cost per unit under prime cost, factory cost and office cost. Also calculate the profit or loss made.

Direct Material	2,40,000	Salary:	
Direct Labour	50,000	Sales Manager	2,500
Depreciation:		Factory Engineer	2,500
Factory building	1,500	Production Department	25,000
Office building	800	Finished goods - warehouse exp.	2,000
Staff Cars	1,200	Electricity (including Rs 400 for admn. Office)	4,000
Branch Office expense	4,000	Advertisement	2,000
Insurance:		Sundry factory expenses	34,000
Staff cars	150	Sales promotion	500
Office building	120	Office administration	5,000
Factory building	150	Expenses for participating in an exhibition	1,000
Delivery van : Running & maintenance expenses	1,000	Sales (Units produced 1,000)	4,20,000

Question 4 :

What is Cost Centre? State the Difference between Production Cost Centre & Service Cost Centre.

Solutions for test-1

1. Statement showing calculation of cost and profit at 30% and 100% capacity

Particulars	30% capacity (30,000 units)		100% capacity (1,00,000 units)	
	p.u.	Total	p.u.	Total
a) Works cost (i.e. Factory cost)	380	1,14,00,000	310	3,10,00,000
b) Fixed Admini. exp.	5	1,50,000	1.50	1,50,000
c) Fixed marketing exp.	8.3333	2,50,000	2.50	2,50,000
d) Variable Distri. cost	30.00	9,00,000	30.00	30,00,000
e) Special cost				
I) Gift items	-	-	30.00	30,00,000
II) Prizes for Lucky Draw (50,000 + 25,000 + 10,000) + (5000 X 3)	-	-	1.00	1,00,000
III) Refreshment exp.	-	-	1.00	1,00,000
IV) Sponsorship of TV program	-	-	20.00	20,00,000
sub-total (e)	-	-	52.00	52,00,000
f) Cost of sales (a+b+c+d+e)	423.333	1,27,00,000	396	3,96,00,000
g) Sales value	550	1,65,00,000	500	5,00,00,000
h) Profit (g-f)	126.666	38,00,000	104	1,04,00,000

2. I) Lest's assume cost of sales for current year be ₹x

Present & Revised cost & profit structure

Particulars	Present Year	Coming year if selling price of ₹ 35,000 is retained
a) Material cost	0.40x	0.40x + 10% = 0.44x
b) Labour cost	0.30x	0.30x + 15% = 0.345x
c) Over head cost	0.30x	0.30x
d) Cost of sales (a+b+c)	x	1.085x
e) Profit (f-d)	(35,000 - x)	(35,000 -1.085x)
f) Sales	35,000	35,000

From last column of above table

$$(35,000-1.08x) = 0.80\ (35,000 - x)$$

$$35,000-1.085x = 28,000 - 0.80x$$

$$7,000 = 1.085x - 0.80x$$

$$0.285x = 7,000$$

$$x = ₹\ 24,561$$

ii) Profitability statement for the current year & coming year if selling price for the equipment is retained exiting profit %

Particulars	Current Year	Coming Year
a) Materials	9,825	10,808
b) Labour	7,368	8,473
c) Over heads	7,368	7,368
d) Cost of sales (a+b+c)	24,561	26,649
e) Profit	10,439	8,351
f) Sales	35,000	35,000

$$= \frac{₹\ 10,439}{₹\ 24,561} \times 100 = 42.5023\% \text{ of cost sales}$$

iii) Statement showing calculation of New selling price for the equipment

Particulars	Amount (₹)
a) Materials	10,808
b) Labour	8,473
c) Overheads	7,368
d) Cost of sales (a+b+c)	26,649
e) Profit (d X 42.5023%)	11,326
f) New selling price to maintain same % profit on cost of sales (d+e)	37,975