

CAT 2

INFORMATION FOR MANAGEMENT CONTROL

CERTIFIED ACCOUNTING TECHNICIAN



STUDY TEXT



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STUDY GUIDE 3: ELEMENTS OF COST

Get Through Intro

In order to obtain correct information of the cost of a finished product, an entity has initially to identify the various types of costs incurred by it. The costs are grouped into three types, i.e. material, labour and overheads.

Depending on the type of the industry and the products manufactured, the costs incurred under each of these types would differ. Nevertheless, it is important to classify, account, apportion and allocate these costs accurately, so that the product bears the correct cost.

The management accountant should have a good knowledge of the accounting treatment for materials and store procedures for maintaining control.

Wages can be significant in many businesses and the manner of remunerating labour and its accurate accounting becomes important.

Expenses related to production, called “overheads” can be many. Proper accounting and the final apportionment on a reasonable basis to the products is critical to ensure that the finished products carry a fair share of these costs.

This Study Guide covers these areas and prepares you to have a good understanding of the steps involved in the computation of the cost of a finished product.

Learning Outcomes

- a) Describe and illustrate the accounting for material costs (NB stock issue pricing is excluded).
- b) Calculate material requirements, making allowance for sales and product / material inventory changes (NB control levels and EOQ are excluded).
- c) Describe and illustrate the accounting for labour costs (including overtime premiums and idle time).
- d) Prepare an analysis of gross earnings.
- e) Explain and illustrate labour remuneration methods.
- f) Calculate the effect of remuneration methods and changes in productivity on unit labour costs.
- g) Explain and illustrate the process of cost apportionment and absorption for indirect costs (excluding reciprocal services).

Introduction



Case Study

Sweetpies started a business manufacturing various types of confectionery. They manufactured them in automated machines in their plant. The raw material, mainly flour, sugar, eggs, chocolate and flavouring were sourced from a wholesaler under long term contract, in order to avoid price fluctuations.

They set an average selling price for confectionery at \$10 per unit. The costs identified were for the ingredients (material costs), the labour and the other costs such as power and fuel (manufacturing overheads). The selling costs comprised of the salaries and expenses of the salesmen who help sell the confectionery to retailers. Apart from these, some administration costs were also incurred. The budgeted total of all these were expected to be \$7 per unit. Therefore, John, the proprietor, is under the impression that they are making a profit of 30% $[(10-7)/10 \times 100]$.

During the year, as he had spare capacity, John decided to introduce new premium confectionery at a price of \$ 13 per unit.

However, at the end of the year when all the costs and the revenues had been accounted, it revealed that the older products showed a loss and the new products apparently showed very high profits. John was confused as he was certain that the costs had not gone up on the older products and there was no reason they should show such a loss. After a thorough analysis, it was revealed that the accountant captured the material and labour costs for all the products accurately. However, all the indirect costs (overheads) were charged to the older products and none to the premium products.

This error was corrected after a lot of reworking.

In the above case we can clearly see the importance of correctly assigning indirect costs to the products. These indirect costs are equally essential in the running of a business and hence need to be recovered appropriately. This Study Guide elaborates on the methods of applying indirect costs (overheads) to the products.

1. Describe and illustrate the accounting for material costs (NB stock issue pricing is excluded).

[Learning outcome a]

We have already studied the basic concepts of material costs, and direct and indirect materials in Study Guide D2, Learning Outcome 2. We shall now discuss accounting for material costs.

Accounting for material costs includes the whole procedure that ranges from the purchase of raw materials to their issue for production. Material costs are normally direct costs. They are part of the cost per unit. However, indirect materials form a part of indirect costs. These are termed as overheads.

To give them proper accounting treatment, they should both be properly classified. Indirect material may be used in the factory, office or in the selling and distribution divisions.

Example

For a carpenter, wood is considered direct material whereas nuts would be considered indirect materials.

1.1 Accounting for material costs

The following are the journal entries regarding materials:

When direct raw materials are purchased	Dr Materials control account	X	
	Cr Cash / Suppliers		X
When indirect raw materials are purchased	Dr Materials control account	X	
	Cr Cash / Suppliers		X
Raw materials are returned to suppliers	Dr Suppliers	X	
	Cr Materials control account		X
Direct materials issued to production	Dr Work-in-progress control account	X	
	Cr Materials control account		X
Indirect materials issued to production	Dr Production overhead control	X	
	Cr Materials control account		X

On the basis of the above journal entries, accounting for materials can be done as follows:

Example

The following information relates to Sunflower Plc for the year ending December 20X9.

- Opening inventory \$5,000
- Raw materials purchased (20% cash) \$60,000
- Materials issued to production
 - Direct materials \$48,000
 - Indirect materials \$10,000

Journal entries for the above transactions

Dr Materials control account \$60,000
 Cr Suppliers \$48,000
 Cr Cash \$12,000

Being raw materials purchased (20% on cash and 80% on credit)

Dr Work-in-progress control \$48,000
 Cr Materials control account \$48,000

Being direct materials issued for production

Dr Production overhead control \$10,000
 Cr Materials control account \$10,000

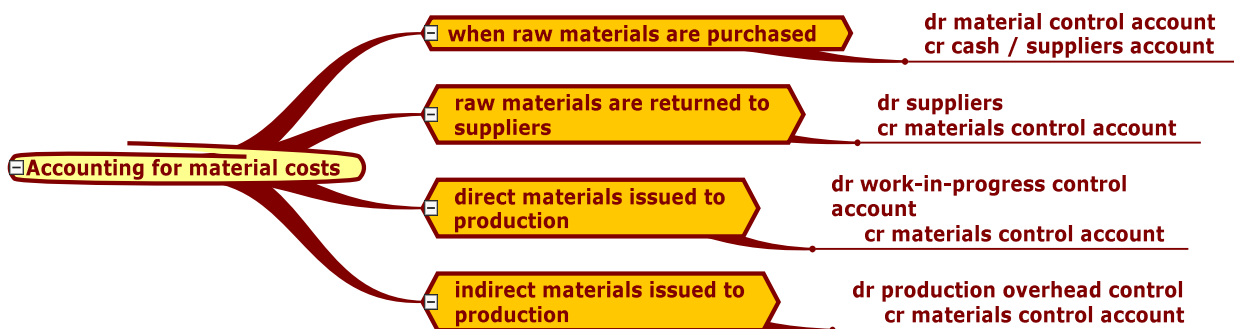
Being indirect materials issued for production

Missing figure of \$7,000 should be considered as closing inventory

Materials control account / Inventory account

Dr			Cr		
Date	\$	Date	\$		\$
	Opening inventory		5,000	Work-in-progress control	48,000
	Suppliers		48,000	Production overhead control	10,000
	Cash		12,000	Closing inventory	7,000
	65,000				65,000

SUMMARY



Test Yourself 1

Lemon Inc has purchased raw materials of \$80,000 from a supplier. It has paid 25% cash. The remaining amount will be paid after three months. Out of the materials purchased, 60% of the materials were issued to the production department.

The journal entry for the material issued to the production department will be:

- (a) Dr Materials control account \$80,000
 Cr Suppliers \$80,000
- (b) Dr Work-in-progress control \$20,000
 Cr Materials control account \$20,000
- (c) Dr Production overhead control \$48,000
 Cr Materials control account \$48,000
- (d) None of the above

1.2 Documents for recording materials

Materials are one of the most important purchases of any organisation. To keep track of inventory / materials, they need to be recorded properly. Materials are generally recorded in a bin card.

1. Bin card

Bin cards are the physical records of movements of stores items. These are used to record the quantitative information for stores items. The receipt, issue and balance of all the materials in the stores are recorded on bin cards. The goods received notes and material returns notes form the basis for an entry of receipt in the bin card and the material requisition notes form the basis of an entry of issue in the bin card.

Sample of format of a bin card

Bin card						
Description.....		Bin no.....				
Code no.....		E.O.Q.....				
		Maximum level.....				
		Minimum level.....				
		Reorder level.....				
	Receipts		Issues		Balance	Remarks
Date	GRN no.	Quantity	MR no.	Quantity	Quantity	

Separate bin cards are prepared for each item of material and these are kept on the shelves or bins near the inventory. Any receipt or issue is immediately recorded when it takes place. At any given point of time, the store keeper is aware of the level of inventory and can place orders for replenishment of materials at appropriate time intervals.

2. Stores ledger

Stores ledger is yet another book that maintains the **quantitative** records of all the receipts, issues and balances along with the **monetary** details for them. This is the major difference between a bin card and a stores ledger. The stores ledger is maintained in the cost accounting department. Preparation of the bin cards and the stores ledgers in parallel helps ensure there is an internal check over inventory to prevent pilferage or misappropriation.

A reconciliation of the bin cards and the stores ledger cards is done on a periodic basis so as to ensure that the balances as per both these set of records are the same (it ensures internal check). Generally, there should be no difference in these balances but at times differences might arise due to:

- arithmetical errors in calculating balances
- mistakes in posting data or not posting some records at all either in the bin card or in the stores ledger
- recording data in the wrong column e.g. receipts in the issues column and vice versa

Format of stores ledger

Stores ledger account												
Material.....										Code.....		
Maximum quantity												
Minimum quantity												
Date	Receipts					Issues				Balance		
	*GRN no./ **MRN no.	Quantity	Invoice reference	Price per unit	Amount	Store req. no.	Quantity	Price per unit	Amount	Quantity	Price per unit	Amount

* GRN – Goods receipt note
 ** MRN – Material return note

3. Continuous physical inventory verification

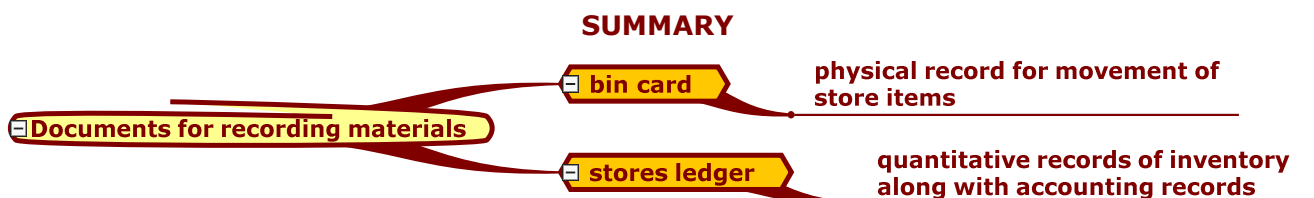
The continuous physical verification of inventory is an important consideration in the perpetual inventory control system. Physical counting is required even when the bin cards and stores ledger present a real picture of the balances in hand as physical verification will reveal the actual balance on hand.

Under perpetual inventory control, the inventory is counted in such a way that the entire range of materials is verified at least once during a year. The period or intervals at which the materials should be reviewed is dependent on the value or importance of the inventory. Certain materials might need verification more than once in a year.

The perpetual inventory control system ensures that discrepancies and losses are minimised. The bin cards and the stores ledger record the receipts and issues of materials at the time when the transactions take place and continuous inventory counts are performed to compare the book records with the physical inventory.

Periodic inventory counts are another widely practiced method to check the physical inventory balance. In this case the inventory is verified only once in a year, usually at the end of the year when the values are to be reflected in the financial statements.

A perpetual inventory system is however a preferable method of inventory control as discrepancies surface and are sorted when they occur. In the periodic verification of inventories the inventory is verified only once a year and it can reveal serious deficiencies in the inventory system. Also periodic inventory counts may require closing down other operational activities like production for facilitating inventory count that is not required in a perpetual inventory system.



Test Yourself 2

Which of the following is correct?

- (i) The goods received notes and the material returns notes form the basis of an entry of receipt in the bin card
 - (ii) The bin card is used for controlling inventories
 - (iii) The bin card shows arithmetical errors in the valuation of closing inventory
 - (iv) The material requisition notes form the basis of an entry of issue in the bin card
- (a) Only (i) and (ii) are correct
 - (b) All four are correct
 - (c) Only (i), (ii) and (iv) are correct
 - (d) Only (i) and (iv) are correct.

Test Yourself 3

Which of the following is incorrect?

- (i) The stores ledger is maintained by the finance department
 - (ii) The stores ledger shows the quantity of inventory along with the accounting record
 - (iii) The movement of stores items are recorded in the stores ledger
 - (iv) The stores ledgers are used to maintain monetary details of receipts, issues and balances of inventories
- (a) Only (iii) is incorrect
 - (b) Only (i) is incorrect
 - (c) None of the above is incorrect
 - (d) All of the above are incorrect

Test Yourself 4

What is perpetual inventory method and what are periodic inventory counts? Which method is more preferable?

2. Calculate material requirements, making allowance for sales and product / material inventory changes (NB control levels and EOQ are excluded).

[Learning outcome b]

2.1 Material requirements

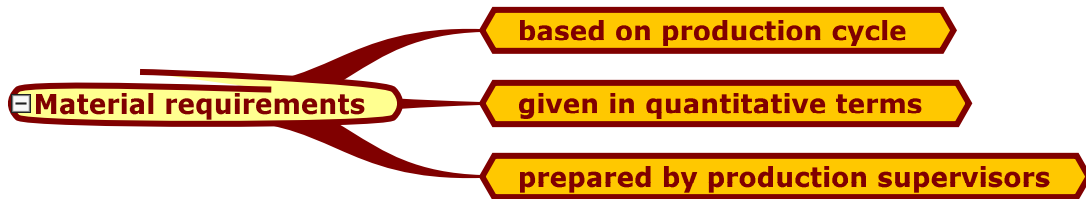
Material requirements for production vary from organisation to organisation. In order to plan the material required for production, it is necessary to have a production Bill of Material. A Bill of Material is a complete list that describes the components or materials that are required for the manufacture of a product. The production manager usually prepares the estimate of all the materials which are required to meet the production budget.

Generally, material requirements are calculated in physical units, such as numbers, kilograms, litres, However, it may be expressed both in quantitative as well as in monetary terms.

Example

Season Ltd's closing inventory at the end of the year 20X8 is 10,000 kg. In the beginning of the year 20X9, the production department has planned the production of 5,000 units. For each unit, 3kg of raw material is required. If Season wants to maintain the level of closing inventory at 15,000 kg, calculate its present requirement of materials.

	Units
Quantity to be consumed according to the material usage budget (5,000 units x 3 kg)	15,000
Add: budgeted closing inventory	15,000
	30,000
Less: planned opening inventory	10,000
Total units to be purchased	20,000

SUMMARY**Test Yourself 5**

The following information is derived from Colours Ltd.

	Product Blue	Product Red
Budgeted production (units)	10,300	42,500
Required quantity of material 'X' per unit	5 Kilogram	2 Kilogram
Required quantity of material 'Y' per unit	8 Kilogram	3 Kilogram

Price per kilogram of material X: \$2.0

Price per kilogram of material Y: \$3.5

Calculate the material requirements

2.2 Allowance for sales and its impact on inventory

A company may not be able to successfully scale up the production at a reasonable cost in the case of insufficient / scarce raw materials. Changes in volume, either of sales or production will have an impact on the inventory levels. Such changes will also have a consequential effect on the quantity of material required and purchase planning.

Example

The following are extracts from Festivals Co's sales budget.

	Units
Opening inventory	10,000
Add: Production	50,000
	60,000
Less: Closing inventory	(20,000)
Sales	40,000

Here, Festivals had estimated the level of closing inventory and sales. Accordingly, it has planned its production and material requirements. If there are any changes in sales volume, it will directly affect the level of closing inventory. Any changes in closing inventory will change the estimates of the material requirements / production for the next period.

Relationship between movements in inventory and sales

A variation in units sold directly affects levels of closing inventory. For example, if an organisation has estimated production and sales units of 10,000 and 8,000 respectively, the closing inventory will be the remaining 2,000 units. However, due to change in sales structure, if sales get increased up to 9,500 units, closing inventory will also go down by 500 units instead of 2,000 units.

This change will change the estimation of inventory turnover. If the closing inventory goes down, the safety level and material requirements will soon arise.

Test Yourself 6

The following are the sales and production estimates for the year J20x9, January and February.

Inventory at the end of December 20X8	6,000 units
Budgeted production and sales for January 20X9	10,000 and 12,000 units respectively
Budgeted production and sales for February 20X9	12,000 and 10,000 units respectively

Actual production and sales for the month of January and February were as follows:

	Production	Sales
January	10,000	14,000
February	12,000	11,000

The closing inventory for February will be _____ by this estimation.

- (a) 3,000 increased
- (b) 3,000 decreased
- (c) NIL
- (d) None of the above

3. Describe and illustrate the accounting for labour costs (including overtime premiums and idle time).

[Learning outcome c]

3.1 Accounting for labour costs

The labour account refers to the account used to record the **entries for wages**. The 'Wages Control account' is the labour account used for these purposes. The entries are first charged to this account and then reallocated to the work in progress and overheads accounts. The journal entries are given:

	Transaction	Accounting Entry
1.	Total salary and wages paid	Dr Wages control account Cr Cash / bank account Being salary and wages paid to workers
2.	Direct labour cost charged to production	Dr Work in progress account Cr Wages control account Being direct labour cost charged to products
3.	Indirect labour cost charged to production	Dr Production Overhead control account Cr Wages control account Being indirect labour cost charged to products

Explanation of these entries

Transaction 1	Transaction 2	Transaction 3
All the expenses of salaries and wages (direct + indirect) are first debited to the 'wages control account' and the corresponding credit is made to the 'cash and bank account'. The expenses are recognised and debited to the wages control account.	The cost of the direct labour hours consumed for production is transferred to the 'work in progress account' and credited to the 'wages control account'. These expenses are actually charged to the 'work in progress account'.	The cost of the indirect labour hours worked for different departments e.g. production, selling, distribution etc. is absorbed on a suitable basis. The indirect cost calculated is then charged to the 'production overhead control account'.

These entries are for wages paid and charged to the work in progress and overhead control a/c. The following are the extracts of the ledger accounts. The extracts are incomplete accounts highlighting only the journal entries explained above. The figures included in these accounts are illustrative.

Wages control account

Dr			Cr		
Date		\$	Date		\$
	Bank	1,000		Work in progress	750
				Overhead control	250

Work in progress account

Dr			Cr		
Date		\$	Date		\$
	Wages control	750			

Overhead control account

Dr			Cr		
Date		\$	Date		\$
	Wages control	250			

Example

The following transactions took place in Smith & Co during the month of June 20X6.

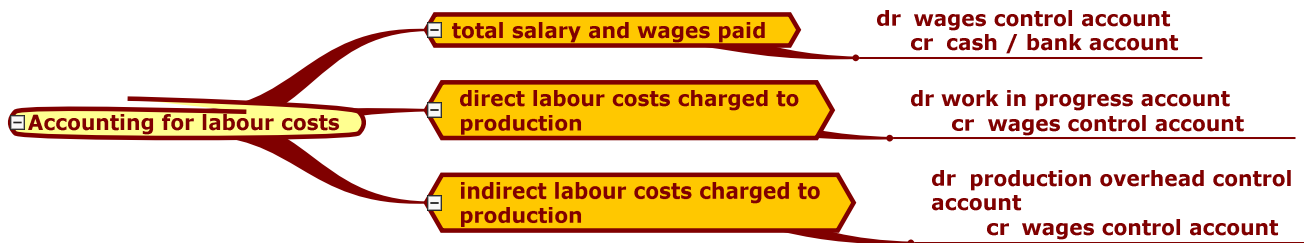
		\$
(a)	Wages paid (40% indirect) in cash	49,000
(b)	Manufacturing expenses incurred in cash	41,800
(c)	Manufacturing overheads charged to production	41,000

You are required to make the journal entries for the above transactions for Smith & Co.

Answer**Smith & Co**

		\$	\$
(a)	Dr Wages control a/c Cr Cash Being the entry for direct and indirect wages paid	49,000	49,000
	Dr Work-in-progress a/c Dr Production overhead a/c Cr Wages control a/c Being direct and indirect wages allocated 60% being direct and 40% indirect	29,400 19,600	49,000
(b)	Dr Production overhead a/c Cr Cash Being the production overhead incurred	41,800	41,800
(c)	Dr Work-in-progress a/c Cr Production overhead a/c Being the overheads charged to production	41,000	41,000

SUMMARY



Test Yourself 7

Orange Ltd paid \$ 60,000 as wages. Out of the total wages, 35% were indirect wages. The journal entry regarding the payment of wages will be:

- (a) Dr Work-in-progress a/c \$60,000
Cr Wages control a/c \$60,000
- (b) Dr Production overhead a/c \$21,000
Cr Wages control a/c \$21,000
- (c) Dr work-in-progress a/c \$49,000
Cr Production overhead a/c \$49,000
- (d) Dr Wages control a/c \$60,000
Cr Cash \$60,000

1. Overtime wages

The minimum wages act applicable to a country specifies the minimum hourly wages that are payable to a worker. Apart from the wages paid for normal time, the employer might be required to **pay for the overtime work done** by the employees. Any wages paid in addition to the normal wages payable for the work done beyond normal hours of work is termed overtime premium. **Overtime premium** is generally treated as **an indirect labour charge**.

Overtime wages are generally paid **at a higher rate** than the normal wages. These wages are however not a part of the minimum wages payable as per law. These are either paid at double the rate of the normal wage rate or at any rate that is higher than the normal rate.

Example

Overwork Plc needs to fulfil an order for which it will have to resort to working overtime for two weeks. The normal hourly wage is \$10 and the management has agreed to pay any overtime work at \$18 per hour. A normal working day consists of 8 hours and there are 5 working days in a week. The working hours recorded for three workers, A, B and C is given below:

Worker	Hours worked in two weeks
A	120
B	160
C	100

Calculation of overtime hours for each worker

Normal hours per week for each for 2 weeks = 8 hours per day x 5 days per week x 2 weeks = 80 hours

Overtime hours = Actual hours worked – Normal hours

For A = 120 – 80 = 40 hours

B = 160 – 80 = 80 hours

C = 100 – 80 = 20 hours

Calculation of overtime wages

	Calculation	Total wages \$
A	\$18 x 40 hours	720
B	\$18 x 80 hours	1,440
C	\$18 x 20 hours	360

This expense is generally treated as an overhead expense. However, if the overtime is done for a particular job or process then the cost is charged as an overhead of that particular job or process. Any overtime caused by abnormal conditions such as a flood, earthquake or any other natural catastrophe is charged as an expense directly in the profit and loss account.

SUMMARY



Test Yourself 8

Shirley is an employee of Frutics Ltd. Her weekly hours are 44 per week. She is being paid \$6.80 per hour. For the last week she had worked for 4 days. For the first three days, she had worked for 12 hours daily and for the fourth day she worked for 10 hours. Her overtime hours will be _____ hours.

- (a) 8 hours
- (b) 2 hours
- (c) 46 hours
- (d) None of the above

2. Idle time

Idle time is a routine phenomenon experienced by almost all organisations. Idle time payment represents wages paid for the unproductive time caused due to unavoidable circumstances such as machine breakdowns, material shortage, poor production scheduling etc. Since most of the reasons for idle time are controllable using better management techniques and closer supervision, management always tries to reduce this time as far as possible.

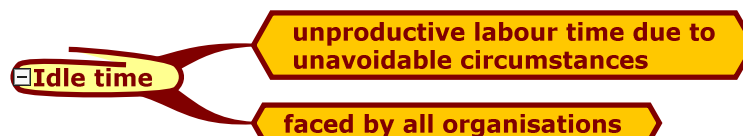
This can be done by employing proper maintenance staff who will constantly monitor the working of machines and also repair any bad tools. A proper scheduling of work will also help avoid a situation where there is a lack of work for the employees.

Test Yourself 9

Employer will have to pay employees for idle time.

- (a) True
- (b) False

SUMMARY



3.2 Documents for recording labour costs

Apart from the accounting for labour costs, costs are also recorded in organisations through time cards, time sheets, job cards etc. Depending on the unit of measurement used by organisations, different recording methods are followed. Time sheets for workers are paid on the basis of hours worked, and, piecework tickets for workers are paid on the basis of piecework etc.

1. Time card

The timekeeping department is usually responsible for recording and maintaining time records. These records help in payroll preparation and also act as primary reference documents. They help in the analysis and determination of labour productivity and, therefore, cost control.

There are various ways in which time can be recorded. This can be done by:

- measuring the time each worker spends in the factory; or
- measuring time each worker spends on a job.

Specimen of time card

Attendance sheet																																
Name: -----				Designation -----				Employee reference number:-----														Leave entitlement:-----										
Age ----				Department: -----																		Leaves availed -----										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Jan																																
Feb																																
Mar																																
Apr																																
May																																
Jun																																
Jul																																
Aug																																
Sep																																
Oct																																
Nov																																
Dec																																
	A: absent days																SL: privilege leave															
	L: leave days																PL: paid leave															
	S: sick leave																LM: late mark															
	M: maternity leave																OT: over time															
	UL: unpaid leave																															

The above specimen of timecard is used as attendance sheet for employees. Attendance sheet is being prepared for each employee for the whole year. It is used for maintaining record of arrival time, departure time, and recess time

There are usually several departments from which data for labour costs can be obtained. Common departments from which data are secured include:

- personnel department
- production planning
- time Keeping
- cost accounting

These departments are responsible for various tasks. The **personnel department** is a full-fledged department **handling all the details of the workers and employees of the organisation**. The numerous tasks it handles include:

- the engagement, transfer and discharge of employees
- remuneration schemes to be offered to employees of different departments
- maintenance of personal records of employees like their employment record, and personal details such as address, telephone numbers, investment details, promotions in past jobs etc.
- maintain records for leave structure, leave record, remuneration details, time records like overtime, shift details etc
- issuing reports to the management regarding employees' performance, time keeping, overtime, leave, sickness, disciplinary actions taken, turnover etc.

The **production planning department** is generally responsible for **scheduling work, maintaining schedules** of work by **monitoring** any jobs running behind time, and **issuing job orders to various departments**.

2. Operation card

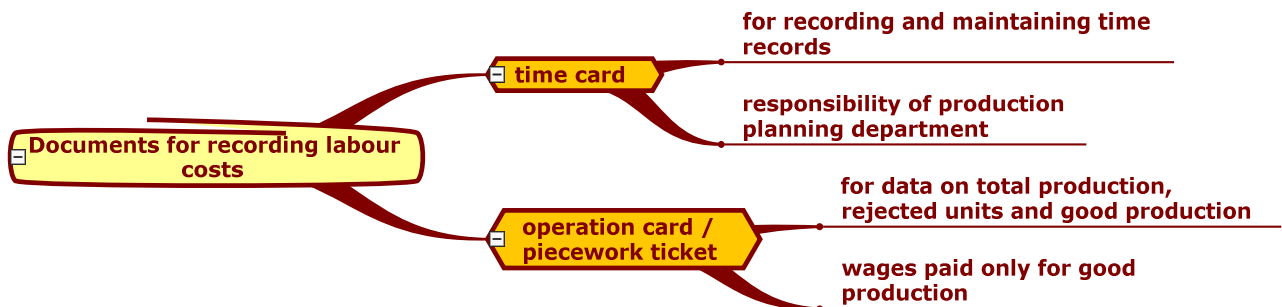
An operation card is also known as a piecework ticket. It is used for workers in a piece-wage system to determine their wages and costs of work. Pieceworkers are paid only on the basis of signed operation cards.

An operation card shows details about, total production, rejected units and good production. Wages are only paid for good production.

Specimen of an operation card

Operation card				
Employee's name:-----			Total batch quantity:-----	
Clock No:-----			In time:-----	
Week No:-----			Out time:-----	
Date:-----				
Component No:-----				
Job order No:-----				
Operation:-----				
Work instructions:-----				
No of units produced	No of units rejected	Good production units	Rate	Amount in \$
Inspector: -----			Operative:-----	
Foreman: -----			Date:-----	
Signature: -----				

SUMMARY



Test Yourself 10

Which of the following statements is true?

- (i) The personnel department maintains the personal records of employees.
 - (ii) The production department handles transfers and discharge of employees.
 - (iii) The production planning department is responsible for work schedules.
 - (iv) The production department is not responsible for issuing job orders to various departments.
- (a) (i), (ii) and (iv) are correct
 - (b) Only (i) and (iii) are correct
 - (c) All of the above are correct
 - (d) None of the above is correct

4. Prepare an analysis of gross earnings.

[Learning outcome d]

4.1 Gross earnings and gross pays

Gross earnings and gross pays refer to the same thing as seen from two different perspectives. Earnings mean the amount earned by an employee and pays mean the amount paid by an employer.

Gross earnings for individuals refer to the total income earned in a year, prior to any deductions. This means gross income or total income before any appropriate deductions or adjustments.

Example

Jennifer, who earned a total of \$50,000 for the recently completed financial year, made \$5,000 from contributions to a government-sponsored savings plan. Because her contributions reduce her taxable earnings, Jennifer is allowed to base her tax calculations off **taxable earnings** of \$45,000, while her **actual gross earnings** for the year are \$50,000.

It also includes overtime pay, commissions, bonus, vacation pay, PF contribution, ESI contribution, medical benefits and other earnings. However, these should be calculated before any deductions. Earnings after deductions are considered as net earnings while earnings before any deductions are gross earnings. Gross pay is the amount paid to an employee in each pay period. Hourly gross pay is calculated by multiplying the number of hours worked in the pay period times the hourly pay rate.

Example

Monty is a permanent employee. His hourly pay is \$10. He is supposed to work 180 hours in a month. During the last month, he worked for 185 hours. Overtime pays are one and half times actual pay. Monty also gets 5% commission on sales. Sales last month amounted to \$1,000.

Gross earnings of Monty for the last month

	\$
Basic pay (180 hours x \$10)	1,800
Overtime pay (5 hours x \$10 x 1.5 times)	75
Commission on sales (\$1,000 x 5%)	50
Gross earnings	1,925

Example

Wilkinson has worked for 44 hours during the last week at the rate of \$20 hourly pay. Out of the total hours, 8 were overtime hours. Consider overtime wages to be double of the normal wages.

Here, gross pay for Wilkinson would be:

$$\begin{aligned}
 &= \text{Normal pay} + \text{Overtime pay} \\
 &= (\text{Number of hours worked} \times \text{Hourly rate}) + (\text{Overtime hours} \times \text{Hourly rate} \times 2) \\
 &= (36 \text{ hours} \times \$20) + (8 \text{ hours} \times \$20 \times 2 \text{ times}) \\
 &= \$720 + \$320 \\
 &= \$840
 \end{aligned}$$

Amount of pay before any deductions is gross pay. Let's take another example to gain a better understanding of calculating gross pay.

Example

Mary works full time in a toy store. Her regular work week is 37 hours and she earns \$9.25 an hour. If she works more than 37 hours a week, she earns at a time and a half of the normal rate for the extra hours. One week she works the hours listed below. What will Mary's gross pay be for the week?

Sun	Mon	Tues	Wed	Thu	Fri	Sat
-	7 hours	7 hours	8 hours	8 hours	8 hours	3 hours

$$\text{Total hours} = 7 + 7 + 8 + 8 + 8 + 3 = 41 \text{ hrs}$$

$$\text{Over-time hours} = 41 \text{ hrs} - 37 \text{ hrs} = 4 \text{ hrs}$$

$$\text{Regular pay} = \$9.25 \times 37 \text{ hrs} = \$342.25$$

$$\text{Over-time pay} = \$9.25 \times 1.5 \times 4 \text{ hr} = \$55.50$$

$$\text{Gross pay} = \$342.25 + \$55.50 = \$397.75$$

4.2 Net pay / net earnings

Net earnings are the amount received by the employee after subtracting total deductions from gross earnings. It is determined by subtracting payroll deductions from gross earnings.

$$\begin{aligned} \text{Net earnings} &= \text{Gross earnings} - \text{Total deductions} \\ \text{Total deductions} &= \text{Taxes} - \text{Other deductions} \end{aligned}$$

The employers must make the following deductions from gross earnings before paying the net earnings to employees.

- PAYE (income tax)
- Employee's National Insurance Contributions

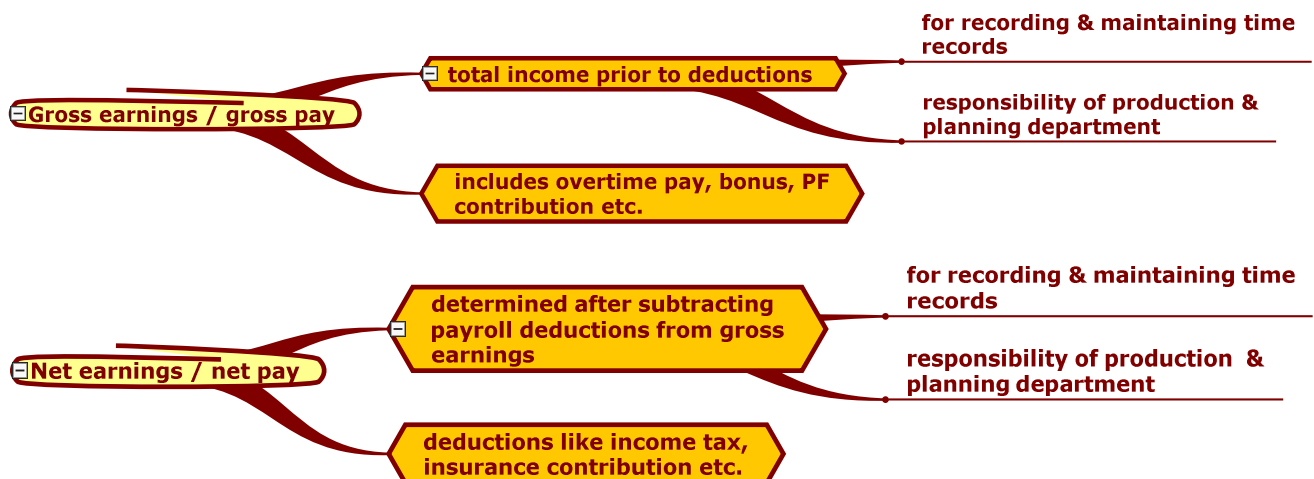
Example

Jacob is paid an hourly rate of \$8 for working 40 hours per week. Overtime wages are twice the regular pay. Jacob has worked for 43 hours in a week. The income tax to be deducted for the week is 35% and the employer's National Insurance Contribution is 10%.

$$\begin{aligned} \text{Gross earnings} &= \text{Regular pay} + \text{Overtime pay} \\ &= (40 \text{ hours} \times \$8) + (3 \text{ hours} \times \$8 \times 2 \text{ times}) \\ &= \$320 + \$48 \\ &= \$368 \end{aligned}$$

$$\begin{aligned} \text{Net earnings} &= \text{Gross earnings} - (\text{PAYE} + \text{Employee's national insurance contributions}) \\ &= \$368 - (\$368 \times 35\% + \$368 \times 10\%) \\ &= \$368 - (\$128.80 + \$36.80) \\ &= \$368 - \$165.60 \\ &= \$202.40 \end{aligned}$$

SUMMARY



Test Yourself 1 1

Daisy is paid an hourly rate of \$7.20 for a 37 hour week. Overtime wages are one and half times the regular pay. Daisy has worked for 40 hours in a week. The income tax to be deducted for the week is 40% and the employer's National Insurance Contribution is 12.50%.

Her gross earnings will be:

- (a) \$266.40
- (b) \$32.40
- (c) \$298.80
- (d) \$141.93

Test Yourself 1 2

In the above example, Daisy's net earnings will be \$_____.

- (a) \$266.40
- (b) \$32.40
- (c) \$298.80
- (d) \$141.93

5. Explain and illustrate labour remuneration methods.

Calculate the effect of remuneration methods and changes in productivity on unit labour costs.

[Learning outcomes e and f]

5.1 Labour remuneration methods**1. Time-based systems of remuneration**

Under the time-based system, the basis for the calculation of wages is “**time**”. This system disregards the number of units produced by a worker for calculating the wages paid. This wage rate of a worker may be determined on an hourly, daily, weekly or monthly basis. In industries where the products are produced by groups of workers, the contribution of each of the workers in producing the product cannot be measured. Again, in a highly automated system of production, the contribution of each worker in the production is not distinguishable. In such cases, a time-based system is preferred to a piecework system e.g. in the construction industry, workers are paid on a time basis. The logic here is that the work of an individual employee is not measurable.

Workers are paid on the basis of the **time they spend on work**. Rates of wages per hour, per day, week or month are fixed in advance, taking into account the factors prevalent (i.e. hazards associated) in that industry, e.g. the wages of the workers in an ammunition factory are set at a high rate since they work in high risk conditions.

The formula for calculation of wages under the time-based systems is:

$$\text{Wages} = \text{Hours worked} \times \text{Wage rate per hour}$$

Example

Roger works for 8 hours a day and the wage rate per hour is \$6. His daily wages under the time based system will be calculated as: 8 hours x \$6 = \$48 per day

Time-based systems of wage payment are applicable mainly to indirect workers, supervisors and managerial staff. Direct labour is generally paid a wage based on productivity i.e. the piecework-based remuneration systems.

The above discussions are confined to a simple time rate system. The various other types of remuneration schemes developed, based on a time rate system, are the high wage rate system, measured day work system and the differential time rate system. The differential system is explained below in brief.

2. Differential time rate system

This system of payment is similar to the differential piece rate system. The worker is paid the basic time wage up to a certain level of efficiency. Based on the efficiency level, the hourly rate rises above this rate. An illustrative table, showing bonus rates at different efficiency levels, is given below.

Efficiency level	Earning / hour
Up to 75% of normal output	\$9
More than 75% up to 100% of normal output	\$10
Above 100% up to 130% of normal output	\$11

The levels of efficiency and the wage rates are set by the companies, taking into account the industry trend, the working conditions and the nature of the job.

Example

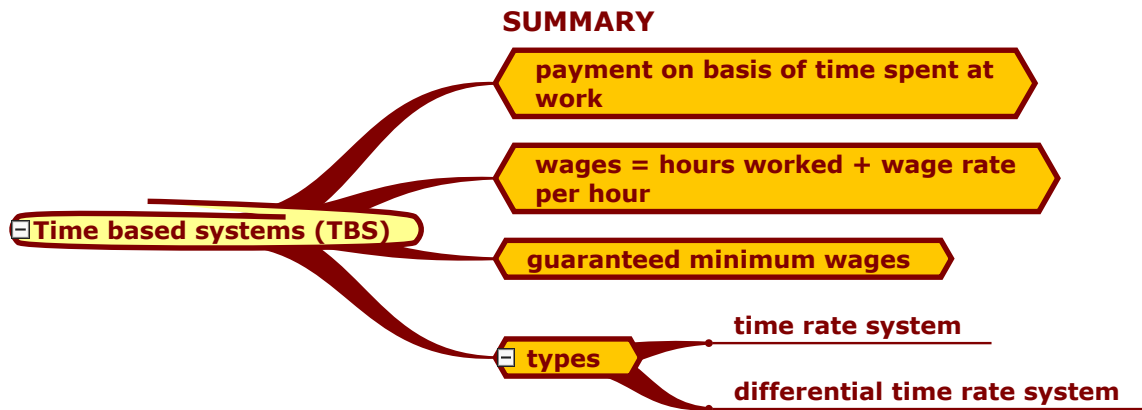
The normal standard output per week of 40 hours is 80 units. Tory produces 100 units in a week. Calculate his wages under the differential time wages system if the company’s policy is to pay a fixed time rate of \$9 per hour if the normal output level is achieved and \$11 per hour if the output is above 100% of the normal output.

Tory produces 100 units, which is more than 100% of the normal output (i.e. 100% of 80 = 80 units). His efficiency is = number of units produced by him/normal output x 100
= 100/80 x 100 = 125%.

Continued on next page

As a result, he will be paid at the higher wage rate of \$11 since as per the policy of the company anyone who produces above 100% of normal output will be paid at a higher wage.

The wages for Tory for the week will be calculated as = \$11 x 40 hours = \$440



Test Yourself 13

Henna produces 110 units in a standard week of 40 hours. The normal weekly output is 90 units. Calculate Henna's wages for the week if the company has the following wage rules:

Efficiency level	Earning / hour
Up to 75% of normal output	\$10
More than 75% up to 100% of normal output	\$11
Above 100% up to 130% of normal output	\$12

Test Yourself 14

A time-based system of remuneration focuses on quality of output rather than quantity of output.

- (a) True
- (b) False

3. Piecework systems

Piecework systems pay employees based on the number of units they produce. The output level is measured by calculating the number of acceptable completed units produced by a worker.

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

Example

A worker is promised a wage of \$2 for each good unit produced. If he produces 50 units he will earn \$2 x 50 units = \$100. If he produces 100 units he will get \$2 x 100 units = \$200.

Simple piecework systems of wage payment do not guarantee minimum time wages to workers, but pay them only on the basis of the number of units produced. However, modified piecework systems guarantee the minimum wages to workers in order to protect them from any loss of earnings.

In this system, an effort is made to link the payment to be made to the worker with the **total amount of work done** by him. Under these methods, a worker gets a higher wage for higher productivity.



These schemes induce workers to improve upon their productivity. The employee benefits as his wages increase with increased productivity. The employer benefits from the fact that the overall cost per unit decreases as the productivity of the workers increases.

Example

Vandy is paid \$2 per unit of output. She works for a standard 40 hours per week. The production overhead cost incurred is \$1 per direct labour hour. The following table makes it clear how the per unit cost decreases as the productivity of the labour increases.

Units produced by Vandy	Total wages (\$2 x number of units produced)	Production overhead cost	Total conversion cost	Cost per unit (Total cost/number of units produced)
80	160	40	200	200/80 = \$2.5
100	200	40	240	240/100 = \$2.4
120	240	40	280	280/120 = \$2.33

As seen from the table above, the total cost per unit decreases as the worker produces more units. This is because although the piecework system pays the labour according to the number of units produced, the rest of the costs are time related and hence remain the same irrespective of the number of units produced.

The different methods of wage calculations under the piecework system include the **straight piecework** and the **differential piecework**. The popular systems of wage payments under the differential piecework are the Taylor system and the Merrick system.

a) Straight piecework

This is the most common type of incentive plan. A straight piecework system pays a workman for the **number of items/units produced**.

The formula used is as follows:

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

b) Differential piecework system

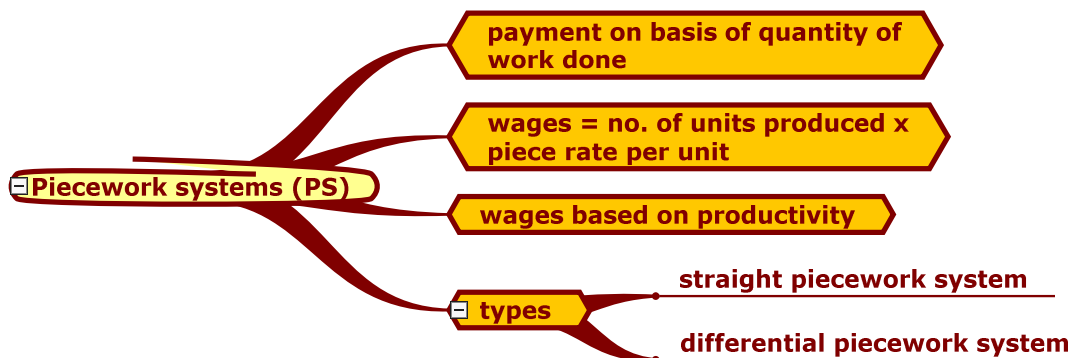
This system gives the workers a chance to earn a bonus / incentive as their productivity increases.

Example

The standard normal output is fixed at 100 units per week with a normal wage rate of \$2 per unit. If the worker produces anything beyond this he gets paid \$3 for the additional units above 100 units. If the worker produces 150 units he gets = \$2 x 100 units + 50 x \$3 = \$350

As you can see, the worker earned an incentive for producing a higher number of units.

SUMMARY



Test Yourself 15

The piecework system of remuneration links the payment to be made to the worker with the:

- (a) Time spent on work
- (b) Total amount of work done
- (c) Time saved
- (d) Skill set of workers

Test Yourself 16

The normal weekly output is fixed at 80 units per week. The wage rate is fixed as normal piece rate for an efficiency level of 75%. Above this each additional unit produced will be paid above the normal rate. The normal piece rate is \$2 per piece and the piece rate for additional units above 75% accuracy is \$3 per piece.

Calculate the wages for Andrew if he produces 70 units in the week.

5.2 Unit labour costs (ULC) and changes in productivity

1. Unit labour costs

Unit labour costs (ULC) measure the average cost of labour per unit of output and are calculated as the ratio of total labour costs to real output. Unit labour cost is the remuneration of labour to produce one unit of output.

$$\text{Unit labour costs} = \frac{\text{Labour costs}}{\text{Production units}}$$

Example

Jordon Inc has paid a total labour remuneration of \$500,000 for the month including overtime pays. The production during the month was 50,000 units.

$$\begin{aligned} \text{Unit labour costs} &= \frac{\text{Labour costs}}{\text{Production units}} \\ &= \frac{\$500,000}{50,000} \\ &= \$10 \text{ (per unit)} \end{aligned}$$

2. Changes in productivity

Due to improvements in production techniques, or because of the introduction of new machineries, productivity can be improved.

An increase in production will not always result in an increase in costs. If costs remain the same and production increases, increased productivity will lead to a fall in the unit labour cost.

Example

The following information from January 20X9 relates to Silver Co.

➤ Number of labourers engaged	150
➤ Units produced	500
➤ Hours worked	20
➤ Wages per hour	\$6

In the February 20X9, Silver introduces new automated machines, which will reduce the production time and the labour required. It is estimated that from now onwards, 600 units will be produced with the engagement of 120 workers in just 22 hours.

Continued on next page

For January 20X9

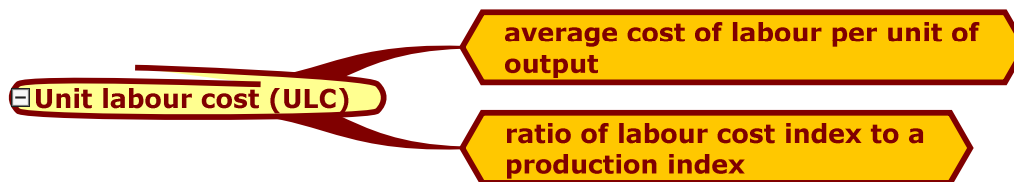
Remuneration to workers/labour costs = Normal wages
 = (150 workers x 20 hours x \$6)
 = \$18,000

$$\begin{aligned} \text{Unit labour costs} &= \frac{\text{Labour costs}}{\text{Production units}} \\ &= \frac{\$18,000}{500 \text{ units}} \\ &= \mathbf{\$36.00} \end{aligned}$$
For February 20X9

Remuneration to workers/labour costs = Normal wages
 = 120 workers x 22 hours x \$6
 = \$15,840

$$\begin{aligned} \text{Unit labour costs} &= \frac{\text{Labour costs}}{\text{Production units}} \\ &= \frac{\$15,840}{600 \text{ units}} \\ &= \mathbf{\$26.40} \end{aligned}$$

This shows that an increase in productivity results in a decrease in unit labour costs.

SUMMARY

6. Explain and illustrate the process of cost apportionment and absorption for indirect costs (excluding reciprocal services).

[Learning outcome g]

Identification of costs with cost objectives is called cost apportionment. The given Learning Outcome explains that the allocation and apportionment of overheads depends on whether there is an accurate basis available for assigning the overheads.

6.1 Cost apportionment**1. Allocation of overheads**

Assigning overheads to a production or service cost centre **on an appropriate basis** is known as the **allocation** of overheads.

When costs can be **easily identified** with a particular cost centre they are **allocated to the cost centre**.

Example

The cost of tools issued to the maintenance department will be an overhead cost as these are not direct material items but items of indirect material. This is a specific cost that can be identified only with the maintenance department and hence this cost will be allocated to the maintenance department.

When specific overheads are **incurred for a particular cost centre**, these are **allocated to it**.

Example

A special repair cost is incurred in the machine shop (a cost centre where part processing of the product takes place) due to break down in a machine in the shop. This cost is incurred only in the machine shop and hence this overhead will be allocated only to the machine shop.

Allocation of common costs or general overheads becomes difficult at times as the basis for allocation is imprecise or arbitrary. In such cases, computation of the exact amount of overheads to be allocated to a cost centre becomes difficult. These can only be allocated to cost centres using an appropriate basis.

Example

In a big manufacturing unit that requires a continuous supply of electricity, the electricity is normally generated in-house. This ensures an uninterrupted supply of electricity. In this case, electricity generation is a secondary activity to the main production and hence the cost incurred on this activity will be an overhead cost.

To keep track of the electricity consumption by each department, sub-meters are fitted in each of the departments. The electricity cost, in this case, will be assigned to each department on the basis of the sub-meter readings. This is allocation of electricity cost as the basis of assigning this cost is accurate.

Overheads are always allocated to cost centres. When an organisation is divided into various departments according to their function, it may happen that this division is not suitable for cost allocation. Typically, cost centres are departments, but in some instances a department may contain several cost centres. This helps in the assignment of costs.

Example

An organisation is divided into various departments, one of which is the production department. This department consists of three machines; the melting machine, the moulding machine and the finishing machine. The overheads incurred on each machine can be separately identified.

For costing purposes, instead of considering the entire production department as one single cost centre, we will consider each of the three machines installed as individual cost centres.

2. Apportionment of overheads

In the absence of an accurate basis for assigning the overheads to the cost centres, costs are assigned on the most suitable basis available. This is termed as **apportionment of overheads**.

Example

Consider the above example of the 'in-house electricity generation unit'. If the sub-meters are not fitted in each department then it can pose a problem for the allocation of the electricity costs to the departments.

In this case we will use the most appropriate basis, such as the light points in each department. This will give us a fair amount of accuracy. As the capacity of each light point or power point is given in kilowatts this gives us a nearly accurate estimation of the power consumption in each department. This will now be a case of apportionment of overheads and not allocation.

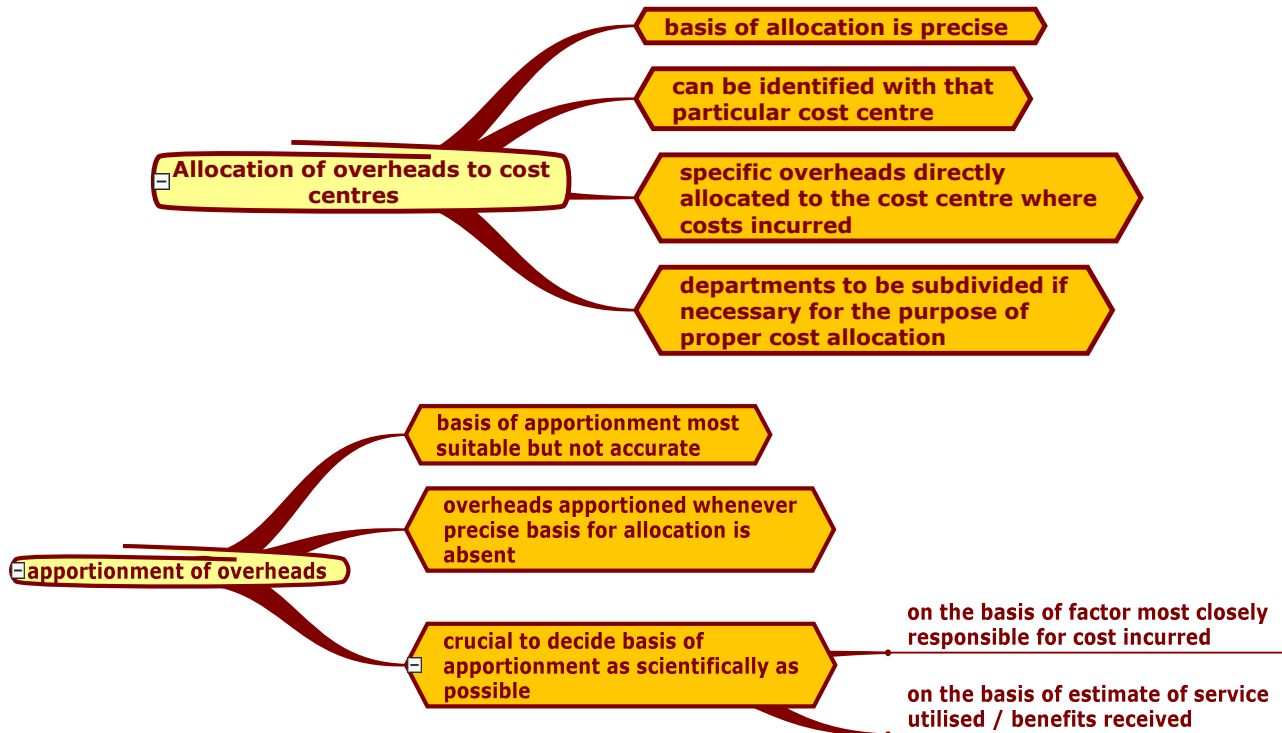
Although the basis used in the above example does not seem to be accurate we still use it as it gives a greater accuracy than any other basis. It can be argued that all the light points are not in use at all times. However, this is what apportionment means, to assign overheads to the departments using a somewhat arbitrary basis since no accurate basis is available.

Example

The salary of a cleaner (for all departments) is a common cost incurred by all departments. In this case, we do not have any precise basis on which we can assign this cost accurately to the various cost centres. We will therefore take the most suitable basis such as the floor area of each department / cost centre.

This will give a fairly accurate cost apportionment. The larger the area of the department, the greater the amount of cost apportion. This is because the cleaner will need more time and effort to clean the department.

SUMMARY



3. Selection of an appropriate basis

The selection of an appropriate basis for the apportionment of overheads to cost centres is a critical decision. If the basis is not reasonable, it might lead to over- or under-assignment of overheads to the products. One of the criteria is to apportion the overheads on the basis of the benefit received by the department.

Example

The salary of the supervisor supervising more than one department / cost centre will be apportioned on the basis of the time spent by him in each department. This is a fair basis as he gets paid on the basis of the hours of work completed by him. In this case, each department should bear the supervision costs in the ratio of the time spent by the supervisor in each department.

One may also apportion the overheads on the basis of the factor that is most closely responsible for the costs incurred.

The commonly used bases for the apportionment of overhead costs to the cost centres are:

	Overhead cost	Basis of distribution
1	All labour related expenses e.g. time keeping, expenses, staff welfare expenses, canteen expenses and indirect labour	Number of employees or wages paid for each department. Direct labour hours are used as a basis for indirect labour
2	Lighting costs	Number of light points, floor space area occupied
3	Supervising costs	Time spent in each department or number of employees in the department
4	Rent, rates and property taxes, heat, light, air conditioning	Area occupied
5	Depreciation of plant and machinery	Capital value / book value of the machinery or plant will form the basis to apportion depreciation to the machine
6	Advertisement	Advertisement is apportioned to products as a percentage of sales value as advertisement expenses are incurred for the purpose of sale of the products

When the service cost centres provide services to each other we use repeated distribution method of apportionment of service costs. The fact that the service departments do service each other might be of little significance where the value of services provided is less. However, in organisations that have fairly large portions of services being offered by the various service cost centres, this method is much more useful. It is cost beneficial only when the costs involved are high since it is a time consuming method. We will first try to solve a simple question where one service centre provides a service to another but does not consume any services from it. Let us try to understand it better with the help of an example.

Example

Mac Plc has provided the following information on the overhead expenses incurred:

Production departments	Dept A \$	Dept B \$	Stores \$	Maintenance \$
Lighting and heating	15,000	20,000	6,000	2,500
Rent	20,000	40,000	7,000	5,000
Indirect materials	25,000	30,000	-	-
Indirect wages	4,000	6,000	3,000	5,000
Depreciation on machines	7,500	9,500	-	-
Total	71,500	105,500	16,000	12,500

The stores department received requisitions worth \$20,000 from department A and \$50,000 from department B. The maintenance workers spent 200 hours in department A and 375 hours in department B. Apportion the service costs to the production departments under the repeated distribution method.

Let us apportion these costs in the departments

In this case the apportionment will be as follows:

The total costs of stores to be apportioned = \$16,000

The total requisitions from the production dept A and B = \$20,000 + \$50,000 = \$70,000

The ratio of distribution for stores dept. will be 20000:50000 = 2:5

The total costs to be apportioned for maintenance dept = \$12,500

The total time spent in the production departments are = 200 + 375 = 575 hours

The ratio of distribution for maintenance will be = 200:375

The distribution will be as below

Production departments	Basis of apportionment	Total costs apportioned \$	Dept. A \$	Dept. B \$	Stores \$	Maintenance \$
Lighting and heating	Direct		15,000	20,000	6,000	2,500
Rent	Direct		20,000	40,000	7,000	5,000
Indirect materials	Direct		25,000	30,000	-	-
Indirect wages			4,000	6,000	3,000	5,000
Depreciation on machines	Direct		7,500	9,500	-	-
Sub-total			71,500	105,500	16,000	12,500

Re-apportionment of service dept costs

		\$	\$	\$	\$	\$
Stores dept.	Value of materials requisitioned 2:5	16,000	\$4,571	11,429	(16,000)	
Maintenance dept.	Labour hours spent in the dept 200:375	12,500	4,348	8,152		(12,500)
Total			80,419	125,081	0	0

6.2 Absorption of indirect costs

After the allocation and apportionment of overheads, they are absorbed. The overhead absorption rate can be derived using the following formula.

$$\text{Overhead absorption rate} = \frac{\text{Apportioned overheads}}{\text{Budgeted machine hours / Budgeted labour hours}}$$

If the production department is a largely machine based department, the overheads of that department should be absorbed on the basis of budgeted machine hours. And if the production department is largely based on labour, the overheads of that department should be absorbed on the basis of budgeted labour hours.

Example

Production department A is mainly a labour based department and B is mainly a machine based department. The company has estimated labour hours and machine hours of 60,000 and 40,000 respectively. The actual labour hours and machine hours were 65,000 and 36,000 respectively. Calculate the overhead absorption rate for both the departments. Assume that total apportioned costs of department A and B is \$128,000 and \$52,000 respectively.

$$\text{Overhead absorption rate} = \frac{\text{Apportioned overheads}}{\text{Budgeted machine hours / Budgeted labour hours}}$$

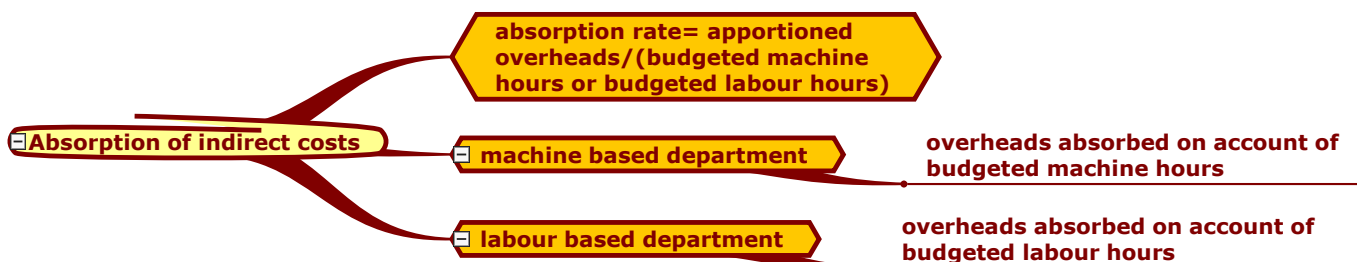
For department A (based on labour hours)

$$\begin{aligned} \text{Overhead absorption rate} &= \frac{\text{Apportioned overheads}}{\text{Budgeted machine hours / Budgeted labour hours}} \\ &= \frac{\$128,000}{60,000 \text{ labour hours}} \\ &= \$2.13 \text{ per labour hour} \end{aligned}$$

For department B (based on machine hours)

$$\begin{aligned} \text{Overhead absorption rate} &= \frac{\text{Apportioned overheads}}{\text{Budgeted machine hours / Budgeted labour hours}} \\ &= \frac{\$52,000}{40,000 \text{ machine hours}} \\ &= \$1.30 \text{ per machine hour} \end{aligned}$$

SUMMARY



Test Yourself 17

The overhead expenses which are incurred only in a specific department are:

- (a) Allocated first to the product and then to the department in which the product is processed
- (b) Allocated directly to that department
- (c) Allocated to the service cost centres which offer the service
- (d) Allocated to all the departments evenly

Test Yourself 18

Amateur Plc has three production departments and two service departments. The following information is available from the departmental distribution summary for the month of May 20X7:

	\$	\$
Production departments		
A	4,800	
B	4,200	
C	3,000	12,000
Service departments		
X	1,400	
Y	1,800	3,200
		15,200

The expenses of service departments are charged on a percentage basis as follows:

Service departments	Production departments		
	A	B	C
X	30%	40%	30%
Y	40%	20%	40%

Show the distribution of the service department cost under the repeated distribution method.

Answers to Test Yourself

Answer 1

The correct option is (d)

The journal entry for materials issued to production will be

Dr	Work-in-progress control	\$48,000	
	Cr	Materials control account	\$48,000

Being 60% materials issued for production

Answer 2

The correct option is (d)

The GRN and material return notes form the basis for an entry of receipt in the bin card and the material requisition notes form the basis of an entry of issue in the bin card.

Answer 3

The correct option is (b)

The stores ledger is maintained in the costing department.

Answer 4

Periodic inventory counts are another widely practised method for checking the physical inventory balance. A perpetual inventory system is, however, a preferable method of inventory control as discrepancies surface and is sorted when they occur. This is because in the periodic verification of inventories the inventory is verified only once a year and it can reveal serious deficiencies in the inventory system.

Answer 5

Calculation of material requirements

Colours Ltd							
Calculation of requirements of direct materials							
	Product Blue			Product Red			Total (kg)
	Production (units)	Materials consumption per unit of production (Kilogram)	Total materials	Production (units)	Materials consumption per unit of production (Kilogram)	Total materials	
Material X	10,300	5	51,500	42,500	2	85,000	136,500
Material Y	10,300	8	82,400	42,500	3	127,500	209,900
			133,900			212,500	346,400

Answer 6

3,000 less than estimation

Difference in closing inventory = 6,000 – 3,000 = 3,000 units

	Budget		Actual	
	January	February	January	February
Opening inventory	6,000	4,000	6,000	2,000
Add: Production	10,000	12,000	10,000	12,000
	16,000	16,000	16,000	14,000
Less: Sales	(12,000)	(10,000)	(14,000)	(11,000)
Closing inventory	4,000	6,000	2,000	3,000

Answer 7

The correct option is (d)

The journal entry regarding the payment of wages will be:

Dr	Wages control a/c	\$60,000	
	Cr	Cash	\$60,000

Answer 8

The correct option is (b)

2 hours

Overtime hours = Worked hours – Regular hours
 = (3 days x 12 hours + 1 day x 10 hours) – 44 hours
 = 46 hours – 44 hours
 = 2 hours

Answer 9

The correct option is (a) - Idle time is the labour time lost due to unavoidable circumstances that are out of control of the employer. The idle time is a part of the total time for which payment is made to employees.

Answer 10

The correct option is (b)

The personnel department maintains personal records of employees and the production planning department handles tasks related to job orders and work schedules.

Answer 11

The correct option is (c)

\$298.80

$$\begin{aligned} \text{Gross earnings} &= \text{Regular pay} + \text{Overtime pay} \\ &= (37 \text{ hours} \times \$7.20) + (3 \text{ hours} \times \$7.20 \times 1.5 \text{ times}) \\ &= \$266.40 + \$32.40 \\ &= \$298.80 \end{aligned}$$

Answer 12

The correct option is (d)

\$141.93

$$\begin{aligned} \text{Net earnings} &= \text{Gross earnings} - (\text{PAYE} + \text{Employee's national insurance contributions}) \\ &= \$298.80 - (\$298.80 \times 40\% + \$298.80 \times 12.5\%) \\ &= \$298.80 - (\$119.52 + \$37.35) \\ &= \$298.80 - \$156.87 \\ &= \$141.93 \end{aligned}$$

Answer 13

The output produced by Henna is 110 units which is above normal. The efficiency level of Henna is $110/90 \times 100 = 122.22\%$. She is therefore entitled to a \$12 hourly rate according to the company rules.

The wages of Henna will be calculated as

$$(\text{Time rate} \times \text{hours per week}) = (\$12 \times 40 \text{ hours per week}) = \$480$$

Answer 14

The correct option is (a)

Under a time-based system workmen are paid on the basis of time spent on the work and not on the basis of their output. Workers are not worried about the volume of output and hence quality is focussed.

Answer 15

The correct option is (b)

The basis for payment of wages to a worker under the piecework system is the number of units produced by him. It induces the workers to increase production. The more a worker produces, the higher the wages he receives.

Answer 16

The output of Andrew is 70 units. This output is $(70/80 \times 100) = 87.5\%$ of the normal output. 75% of normal output is 60 units. The output above 75% is $70 - 60 = 10$ units.

$$\begin{aligned} \text{Therefore he will get wages} &= \text{Output up to 75\% efficiency level} \times \text{Normal wages} + \text{Output above 75\%} \times \\ \text{Additional rate} &= 60 \times \$2 + 10 \times \$3 = \$150 \end{aligned}$$

Answer 17

The correct option is (b)

When the expenses are incurred only in a specific department, these can be easily identified with that department and hence can be allocated directly to that department. Overheads cannot be identified with a specific unit of product and hence cannot be allocated directly to products. Overheads are never allocated to the service cost centres which offer the service but are allocated to the cost centres that use the service. Overheads incurred only in a specific department cannot be allocated to any other department.

Answer 18

Amateur Plc - Secondary distribution summary for May 20X7

	Ratio of apportionment	Production departments			Service departments	
		A	B	C	X	Y
		\$	\$	\$	\$	\$
According to primary distribution		4,800	4,200	3,000	1,400	1,800
Service Dept. X	30:40:30	420	560	420	(1,400)	
Service Dept. Y	40:20:40	720	360	720		(1,800)
		5,940	5,120	4,240	0	0

Self Examination Questions**Question 1**

The following information has been derived from Rose Ltd.

	\$
Raw materials purchased on cash	25,000
Raw materials purchased on credit	100,000
Direct materials issued for production	80,000
Indirect materials issued for production	30,000
Closing inventory	30,000

What will be the amount of opening inventory?

- (a) \$6,000
- (b) \$8,000
- (c) Data inadequate
- (d) None of the above

Question 2

_____ are used to record the quantitative information for store items.

- (a) Bin cards
- (b) Material control account
- (c) Purchase requisition
- (d) Stores ledger

Question 3

State the basic difference between stores ledger and bin card.

Question 4

Which of the following statements are correct?

- (i) Overtime premium is generally treated as an indirect labour charge.
 - (ii) The cost of the direct labour hours consumed for production is transferred to the 'work in progress account' and credited to the 'wages control account'.
- (a) Only i is correct
 - (b) Only ii is correct
 - (c) Both i and ii are correct
 - (d) None of the above is correct

Question 5

_____ is used for maintaining a record of arrival time, departure time, and recess time.

- (a) Time card
- (b) Operation card
- (c) Payroll
- (d) Cost sheet

Question 6

Lotus is the employee of Flower Corp. His regular weekly hours are 40. His pay is \$6.00 per hour. The overtime wages are paid earns at a time and a half of the normal rate for the extra hours by Flower Corp. The following shows Lotus' working hours for the last week.

Monday	6 hours
Tuesday	9 hours
Wednesday	10 hours
Thursday	4 hours
Friday	8 hours
Saturday	6 hours

Lotus' overtime wages to be paid by Flower Corp will be:

- (a) \$32.00
- (b) \$27.00
- (c) \$18.00
- (d) \$320.00

Question 7

_____ is used for workers in a piece-wage system to determine their wages and costs of work.

- (a) Operation card
- (b) Job card
- (c) Bin card
- (d) Cost sheet

Question 8

Lily has worked 38 hours in the last week. Her regular pay is \$5.80 per hour. She is supposed to work for 40 hours per week. If she works more than 40 hours a week, she earns twice her regular pay per extra hour. Lily's gross earnings for the last week will be:

- (a) \$198.00
- (b) \$281.20
- (c) \$268.00
- (d) \$220.40

Answers to Self Examination Questions
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Answer 1

The correct option is (d)

Opening inventory will be \$15,000.

Materials control account / Inventory account

Dr			Cr		
Date		\$	Date		\$
	Opening inventory	15,000		Work-in-progress control	80,000
	Suppliers	100,000		Production overhead control	30,000
	Cash	25,000		Closing inventory	30,000
		140,000			140,000

Answer 2

The correct option is (a)

Bin cards are used to record quantitative information for store items.

Answer 3

Stores ledger is yet another book that maintains quantitative records of all the receipts, issues and balances along with monetary details for these. This is one major difference between a bin card and a stores ledger. Whilst bin cards are a record of the quantity of items in inventory, the stores ledger shows the quantity of inventory along with the accounting record.

Answer 4

The correct option is (c)

Both i and ii are correct

Answer 5

The correct option is (a)

Time card is used for maintaining a record of arrival time, departure time, and recess time.

Answer 6

The correct option is (b)

Overtime wages will be \$27.00

Total working hours = 6 + 9 + 10 + 4 + 8 + 6 = 43 hours

Overtime hours = Total week hours – Regular week hours
 = 43 hours – 40 hours
 = 3 hours

Over time wages = Overtime hours x Hourly pay x 1.5 times
 = 3 hours x \$6.00 x 1.5
 = \$27.00

Answer 7

The correct option is (a)

Operation card is used for workers in a piece-wage system to determine their wages and costs of work.

Answer 8

The correct option is (d)

Gross earnings will be \$220.10

Here, Lily has worked for less than 40 hours; there are no overtime hours.

Gross earnings = Regular wages + Overtime wages
 = (38 hours x \$5.80) + NIL
 = \$220.40



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