Cost accounting 2

Section NO. (2)

Accounting for Indirect Manufacturing Costs

Prepared by :

Shehata Shaheen

The steps of determining unit share from manufacturing costs:

1- Divide the enterprises into a group of production centers and services centers.

production centers	production services centers.
They represent administrative or natural units in which all cost elements are formed and transferred to final product.	They represent administrative or natural units based on serving production centers.

2- calculating the indirect manufacturing costs of services centers and production centers.

- ❑ Costs of centers.
- ❑ General or shared costs.

the steps of determining unit share from manufacturing costs:

3- Allocation costs of services centers to production centers by four methods:

- ❑ The total allocation method.
- ❑ The direct allocation method.
- ❑ The Step-Down allocation method.
- ❑ The reciprocal allocation method.

4- Determining allocation rate for each production center or the enterprises as a whole.

Total costs of production centers ÷ allocation basis.

the steps of determining unit share from manufacturing costs:

5- Determining unit share of the indirect manufacturing costs based on the allocation rate of the center multiplied by unit share from the allocation basis.

6- Determining the total manufacturing costs of unit (direct materials + direct labor + indirect manufacturing costs)

The previous steps are explained an allocation statement as follows:

The statement of allocation the estimated indirect manufacturing costs

Items Costs	Production Centers		Service Centers		Total
	X	Y	A	B	
Cost of centers	××	××	××	××	×××
allocation General costs to the centers	××	××	××	××	×××
Total center costs	××	××	××	××	××
Allocation costs of service centers to production centers (Total – direct- step down – reciprocal)	××	××			×××
Total costs of production centers	××	××			×××
Allocation basis	÷ ××	÷ ××			
Allocation rate	××	××			

Example (1):

The following data were extracted from Celia Co. cost books and records:

1- Production passes through tow production centers (X, Y) and two services centers (power, warehouses).

2- Estimated indirect manufacturing costs for (2024) were as follows:

- **Cost of centers**

Desc.	X	Y	power	warehouses
Indirect materials	8,000	6,000	3,000	5,000
Indirect labor	1,000	8,000	5,000	7,000
Depreciation	12,000	8,000	3,000	5,000

▪ General or shared costs

Desc.	The value (EGP)	Allocation basis
Factory rent	6,000	Area in square meters
Lighting expenses	450	number of lamps
heating	2,000	Number of heat radiators
buildings insurance	9,000	buildings value

3- Estimated activity level and allocation basis :

Desc.	X	Y	power	warehouses
buildings value	60,000	50,000	40,000	30,000
Area in square meters	200	150	50	100
Number of machine hours	10,000	15,000	--	--
Number of direct labor hours	3,000	2,000	--	--
Number of heat radiators	10	5	2	3
Number of lamps	20	10	5	10
Amount of material issued	800	400	400	--

4- The rate of indirect manufacturing costs allocated to production centers is determined based on machine-hours at (X) production center, direct labor hours at (Y) production center.

Required:

Preparing a statement of the allocation of the estimated indirect manufacturing costs using the total allocation method based on direct labor hours.

Solution : The statement of allocation the estimated indirect manufacturing costs

Items Costs	Production Centers		Service Centers		Total
	X	Y	power	warehouses	
Cost of centers:					
Indirect materials	8,000	6,000	3,000	5,000	22,000
Indirect labors	1,000	8,000	5,000	7,000	21,000
depreciation	12,000	8,000	3,000	5,000	28,000
General (shared) costs:					
Factory rent	2,400	1,800	600	1,200	6,000
Lighting expenses	200	100	50	100	450
heating	1,000	500	200	300	2,000
buildings insurance	3,000	2,500	2,000	1,500	9,000
Total estimated (MOH)	27,600	26,900	13,850	20,100	88,450
allocation cost of service centers	20,370	13,580			
Total estimated (MOH)	47,970	40,480			88,450
	÷	÷			
Allocation basis	10,000	2,000			
Allocation rate	4.797	20.373			

Notes on solution

The statement of allocation the estimated indirect manufacturing costs

Items Costs	Production Centers		Service Centers		Total
	X	Y	power	warehouses	
Cost of centers:					
Indirect materials	8,000	6,000	3,000	5,000	22,000
Indirect labors	1,000	8,000	5,000	7,000	21,000
Depreciation	12,000	8,000	3,000	5,000	28,000
General or shared costs:					
Factory rent (6,000 EGP)					
Lighting expenses (450 EGP)					
heating (2,000 EGP)					
buildings insurance (9,000 EGP)					

= total general costs x (share the center from allocation basis ÷ total allocation basis)

1- Shared of the centers from the cost of factory rent (6,000):

- Share of the (X) center = 6,000 x (200 ÷ 500) = 2,400 EGP.
- Share of the (Y) center = 6,000 x (150 ÷ 500) = 1,800 EGP.
- Share of the Power center = 6,000 x (50 ÷ 500) = 600 EGP.
- Share of warehouse center = 6,000 x (100 ÷ 500) = 1,200 EGP.

2- Shared of the centers from the cost of lighting expenses (450):

- Share of the (X) center = 450 x (20 ÷ 45) = 200 EGP.
- Share of the (Y) center = 450 x (10 ÷ 45) = 100 EGP.
- Share of the Power center = 450 x (5÷ 45) = 50 EGP.
- Share of warehouse center = 450 x (10 ÷ 45) = 100 EGP.

= total general costs x (share the center from allocation basis ÷ total allocation basis)

3- The shared of the centers from the cost of heating (2,000):

- share of the (X) center = 2,000 x (10 ÷ 20) = 1,000 EGP.
- share of the (Y) center = 2,000 x (5 ÷ 20) = 500 EGP.
- share of the Power center = 2,000 x (2÷ 20) = 200 EGP.
- share of warehouse center = 2,000 x (3 ÷ 20) = 300 EGP.

4- The shared of the centers from the cost of buildings insurance (9,000):

- share of the (X) center = 9,000 x (60,000 ÷ 180,000) = 3,000 EGP.
- share of the (Y) center = 9,000 x (50,000 ÷ 180,000) = 2,500 EGP.
- share of the Power center = 9,000 x (40,000÷ 180,000) = 2,000 EGP.
- share of warehouse center = 9,000 x (30,000 ÷ 180,000) = 1,500 EGP.

The statement after allocation the General costs

Items Costs	Production Centers		Service Centers		Total
	X	Y	power	warehouses	
Cost of centers:					
Indirect materials	8,000	6,000	3,000	5,000	22,000
Indirect labors	1,000	8,000	5,000	7,000	21,000
depreciation	12,000	8,000	3,000	5,000	28,000
General (shared) costs:					
Factory rent	2,400	1,800	600	1,200	6,000
Lighting expenses	200	100	50	100	450
heating	1,000	500	200	300	2,000
buildings insurance	3,000	2,500	2,000	1,500	9,000
Total estimated (MOH)	27,600	26,900	13,850	20,100	88,450

Allocation the total costs of services centers (power and warehouses) to production centers in the total allocation method using the direct labor hours as following:

- **share of the (X) center = 33,950 x (3,000 ÷ 5,000) = 20,370 EGP.**
- **share of the (Y) center = 33,950 x (2,000 ÷ 5,000) = 13,850 EGP.**

The statement after allocation the total costs of services centers to production centers in the total allocation method

Items Costs	Production Centers		Service Centers		Total
	X	Y	power	warehouses	
Cost of centers:					
Indirect materials	8,000	6,000	3,000	5,000	22,000
Indirect labors	1,000	8,000	5,000	7,000	21,000
depreciation	12,000	8,000	3,000	5,000	28,000
General (shared) costs:					
Factory rent	2,400	1,800	600	1,200	6,000
Lighting expenses	200	100	50	100	450
heating	1,000	500	200	300	2,000
buildings insurance	3,000	2,500	2,000	1,500	9,000
Total estimated (MOH)	27,600	26,900	13,850	20,100	88,450
allocation cost of service centers	20,370	13,580			
Total estimated (MOH)	47,970	40,480			88,450

Determining allocation rate to production centers, as following:

= The allocation rate to the production center = total costs divided by the allocation basis

- **Allocation rate - (X) center = 47,970 ÷ 10,000 = 4.797 EGP per machine-hour.**
- **Allocation rate - (Y) center = 40,750 ÷ 2,000 = 20.373 EGP Per direct labor hour.**

Solution : The statement of allocation the estimated indirect manufacturing costs

Items Costs	Production Centers		Service Centers		Total
	X	Y	power	warehouses	
Cost of centers:					
Indirect materials	8,000	6,000	3,000	5,000	22,000
Indirect labors	1,000	8,000	5,000	7,000	21,000
depreciation	12,000	8,000	3,000	5,000	28,000
General (shared) costs:					
Factory rent	2,400	1,800	600	1,200	6,000
Lighting expenses	200	100	50	100	450
heating	1,000	500	200	300	2,000
buildings insurance	3,000	2,500	2,000	1,500	9,000
Total estimated (MOH)	27,600	26,900	13,850	20,100	88,450
allocation cost of service centers	20,370	13,580			
Total estimated (MOH)	47,970	40,480			88,450
Allocation basis	÷ 10,000	÷ 2,000			
Allocation rate	4.797	20.373			

Frist question : Choose the correct answer :

1- Total indirect manufacturing costs of the production center (X) before allocation costs of services centers : ……

A	27,600 EGP.
B	40,500 EGP.
C	45,850 EGP.
D	28,900 EGP.

The correct answer is (A)

2- Total indirect manufacturing costs of the production center (Y) before allocation costs of services centers : ……

A	**27,600 EGP.**
B	**26,900 EGP.**
C	**45,850 EGP.**
D	**28,900 EGP.**

The correct answer is (B)

3- Total costs of warehouses center from general and special costs : ……

A	**27,600 EGP.**
B	**26,900 EGP.**
C	**20,100 EGP.**
D	**28,900 EGP.**

The correct answer is (C)

4- Total costs of power center from general and special costs : ……

A	27,600 EGP.
B	26,900 EGP.
C	20,100 EGP.
D	13,850 EGP.

The correct answer is (D)

5- Share of the productions center (X) from costs of services center : ……

A	**13,580 EGP.**
B	**26,900 EGP.**
C	**20,370 EGP.**
D	**13,850 EGP.**

The correct answer is (C)

6- Share of the productions center (Y) from costs of services center : ……

A	13,580 EGP.
B	26,900 EGP.
C	20,370 EGP.
D	13,850 EGP.

The correct answer is (A)

7- Total estimated indirect manufacturing costs of Celia Co. as a whole : ……

A	**46,750 EGP.**
B	**47,790 EGP.**
C	**88,450 EGP.**
D	**13,850 EGP.**

The correct answer is (C)

8- Total indirect manufacturing costs of the production center (X) after allocation costs of services centers : .....

A	46,750 EGP.
B	47,970 EGP.
C	88,450 EGP.
D	13,850 EGP.

The correct answer is (B)

9- Total indirect manufacturing costs of the production center (Y) after allocation costs of services centers : .....

A	46,750 EGP.
B	47,790 EGP.
C	88,450 EGP.
D	40,480 EGP.

The correct answer is (D)

10- allocation rate - (X) center : ……

A	4.797 EGP per machine-hour.
B	5.350 EGP per machine-hour.
C	20.373 EGP Per direct labor hour.
D	20.125 EGP Per direct labor cost.

The correct answer is (A)

11- allocation rate - (Y) center : ……

A	4.797 EGP per machine-hour.
B	5.350 EGP per machine-hour.
C	20.373 EGP Per direct labor hour.
D	20.125 EGP Per direct labor cost.

The correct answer is (C)

12- Share of the (X) center from factory rent costs : ……

A	3,000 EGP.
B	2,400 EGP.
C	1,500 EGP.
D	6,000 EGP.

The correct answer is (B)

13- Share of the (Y) center from lighting expenses : ……

A	100 EGP.
B	2,400 EGP.
C	200 EGP.
D	6,000 EGP.

The correct answer is (A)

14- Share of the Power center from heating costs : ……

A	100 EGP.
B	2,400 EGP.
C	200 EGP.
D	6,000 EGP.

The correct answer is (C)

15- Share of warehouse center from buildings insurance costs : ……

A	**100 EGP.**
B	**2,400 EGP.**
C	**200 EGP.**
D	**1,500 EGP.**

The correct answer is (D)