



# **Cost accounting 2**

## **Section NO. (4)**

### **Accounting for Indirect Manufacturing Costs**

**Prepared by :**

**Shehata Shaheen**

— جامعة مدينة السادات —

### Example (3):

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

**1-** Production passes through two 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 step-down allocation method using:

- **power** center allocated based on **machine hours**.
- **Warehouses** allocated based on **materials issued**.
- the warehouses center is serving the largest number of production and service centers.

**Solution : The statement of allocation the estimated indirect manufacturing costs**

Items Costs	Production Centers		Service Centers		Total
	X	Y	power	warehouses	
<b>Cost of centers:</b>					
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
<b>General (shared) costs:</b>					
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
<b>Total estimated (MOH)</b>	<b>27,600</b>	<b>26,900</b>	<b>13,850</b>	<b>20,100</b>	<b>88,450</b>
allocation warehouses center costs	10,050	5,025	5,025		
allocation power center costs	7,550	11,325			
<b>Total estimated (MOH)</b>	<b>45,200</b>	<b>43,250</b>			<b>88,450</b>
Allocation basis	÷ 10,000	÷ 2,000			
<b>Allocation rate</b>	<b>4.52</b>	<b>21.256</b>			

## Notes on solution

### The statement of allocation the estimated indirect manufacturing costs

Items Costs	Production Centers		Service Centers		Total
	X	Y	power	warehouses	
<b>Cost of centers:</b>					
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
<b>General or shared costs:</b>					
Factory rent (6,000 EGP)					
Lighting expenses (450 EGP)					
heating (2,000 EGP)					
buildings insurance (9,000 EGP)					

## Allocation the general costs to production and service centers as following:

### 1- The centers, share from the cost of factory rent:

- Share of the (X) center =  $6,000 \times (200 \div 500) = 2,400 \text{ EGP.}$
- Share of the (Y) center =  $6,000 \times (150 \div 500) = 1,800 \text{ EGP.}$
- Share of the Power center =  $6,000 \times (50 \div 500) = 600 \text{ EGP.}$
- Share of warehouse center =  $6,000 \times (100 \div 500) = 1,200 \text{ EGP.}$

### 2- The centers, share from the cost of lighting expenses :

- Share of the (X) center =  $450 \times (20 \div 45) = 200 \text{ EGP.}$
- Share of the (Y) center =  $450 \times (10 \div 45) = 100 \text{ EGP.}$
- Share of the Power center =  $450 \times (5 \div 45) = 50 \text{ EGP.}$
- Share of warehouse center =  $450 \times (10 \div 45) = 100 \text{ EGP.}$

## Allocation the general costs to production and service centers as following:

### 3- The centers, share from the cost of heating:

- Share of the (X) center =  $2,000 \times (10 \div 20) = 1,000 \text{ EGP.}$
- Share of the (Y) center =  $2,000 \times (5 \div 20) = 500 \text{ EGP.}$
- Share of the Power center =  $2,000 \times (2 \div 20) = 200 \text{ EGP.}$
- Share of warehouse center =  $2,000 \times (3 \div 20) = 300 \text{ EGP.}$

### 4- The centers, share from the cost of buildings insurance:

- Share of the (X) center =  $9,000 \times (60,000 \div 180,000) = 3,000 \text{ EGP.}$
- Share of the (Y) center =  $9,000 \times (50,000 \div 180,000) = 2,500 \text{ EGP.}$
- Share of the Power center =  $9,000 \times (40,000 \div 180,000) = 2,000 \text{ EGP.}$
- Share of warehouse center =  $9,000 \times (30,000 \div 180,000) = 1,500 \text{ EGP.}$



## The statement after allocation the General costs

Items Costs	Production Centers		Service Centers		Total
	X	Y	power	warehouses	
<b>Cost of centers:</b>					
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
<b>General (shared) costs:</b>					
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
<b>Total estimated (MOH)</b>	<b>27,600</b>	<b>26,900</b>	<b>13,850</b>	<b>20,100</b>	<b>88,450</b>

## Allocation the costs of services centers to production centers as following:

### 1- The centers, share from the cost of warehouses services center:

- Share of the (X) center =  $20,100 \times (800 \div 1,600) = 10,050 \text{ EGP.}$
- Share of the (Y) center =  $20,100 \times (400 \div 1,600) = 5,025 \text{ EGP.}$
- Share of the power services center =  $20,100 \times (400 \div 1,600) = 5,025 \text{ EGP.}$

### 2- The centers, share from the cost of power services center:

- Share of the (X) center =  $18,875 \times (10,000 \div 25,000) = 7,550 \text{ EGP.}$
- Share of the (Y) center =  $18,875 \times (15,000 \div 25,000) = 11,325 \text{ EGP.}$

**The statement after allocation costs of services centers to production centers using the step-down allocation method**

Items Costs	Production Centers		Service Centers		Total
	X	Y	power	warehouses	
<b>Cost of centers:</b>					
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
<b>General (shared) costs:</b>					
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
<b>Total estimated (MOH)</b>	<b>27,600</b>	<b>26,900</b>	<b>13,850</b>	<b>20,100</b>	<b>88,450</b>
allocation warehouses center costs	10,050	5,025	5,025		
allocation power center costs	7,550	11,325			
<b>Total estimated (MOH)</b>	<b>45,200</b>	<b>43,250</b>			<b>88,450</b>

Determining allocation rate to production centers, as following:

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

- **Allocation rate - (X) center =  $45,200 \div 10,000 = 4.52$  EGP per machine-hour.**
- **Allocation rate - (Y) center =  $43,250 \div 2,000 = 21.625$  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	
<b>Cost of centers:</b>					
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
<b>General (shared) costs:</b>					
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
<b>Total estimated (MOH)</b>	<b>27,600</b>	<b>26,900</b>	<b>13,850</b>	<b>20,100</b>	<b>88,450</b>
allocation warehouses center costs	10,050	5,025	5,025		
allocation power center costs	7,550	11,325			
<b>Total estimated (MOH)</b>	<b>45,200</b>	<b>43,250</b>			<b>88,450</b>
Allocation basis	÷ 10,000	÷ 2,000			
<b>Allocation rate</b>	<b>4.52</b>	<b>21.625</b>			

## Frist question : Choose the correct answer :

**1- Total costs of warehouses center from general and special costs : .....**

<b>A</b>	<b>27,600 EGP.</b>
<b>B</b>	<b>20,100 EGP.</b>
<b>C</b>	<b>45,850 EGP.</b>
<b>D</b>	<b>28,900 EGP.</b>

**The correct answer is (B)**

**2- Total costs of power center from general and special costs : .....**

<b>A</b>	<b>27,600 EGP.</b>
<b>B</b>	<b>26,900 EGP.</b>
<b>C</b>	<b>13,850 EGP.</b>
<b>D</b>	<b>28,900 EGP.</b>

**The correct answer is (C)**

**3- Total estimated indirect manufacturing costs of Celia Co. as a whole : .....**

<b>A</b>	<b>46,900 EGP.</b>
<b>B</b>	<b>45,900 EGP.</b>
<b>C</b>	<b>20,100 EGP.</b>
<b>D</b>	<b>88,450 EGP.</b>

**The correct answer is (D)**



**4- The Total indirect manufacturing costs before allocated to services centers in production center (Y) : .....**

<b>A</b>	<b>27,600 EGP.</b>
<b>B</b>	<b>26,900 EGP.</b>
<b>C</b>	<b>20,100 EGP.</b>
<b>D</b>	<b>13,850 EGP.</b>

**The correct answer is (B)**

**5- Total indirect manufacturing costs of the production center (X) before allocation costs of services centers : .....**

A	27,600 EGP.
B	26,900 EGP.
C	20,370 EGP.
D	13,850 EGP.

**The correct answer is (A)**

**6- Share of the productions center (X) from costs of warehouses services center : .....**

<b>A</b>	<b>13,580 EGP.</b>
<b>B</b>	<b>26,900 EGP.</b>
<b>C</b>	<b>20,370 EGP.</b>
<b>D</b>	<b>10,050 EGP.</b>

**The correct answer is (D)**

**7- Share of the productions center (Y) from costs of warehouses services center : .....**

<b>A</b>	<b>13,580 EGP.</b>
<b>B</b>	<b>5,025 EGP.</b>
<b>C</b>	<b>20,370 EGP.</b>
<b>D</b>	<b>10,050 EGP.</b>

**The correct answer is (B)**

**8- Share of the power services center from costs of warehouses services center : .....**

<b>A</b>	<b>13,580 EGP.</b>
<b>B</b>	<b>5,025 EGP.</b>
<b>C</b>	<b>20,370 EGP.</b>
<b>D</b>	<b>10,050 EGP.</b>

**The correct answer is (B)**

**9- Share of the productions center (X) from costs of power services center : .....**

<b>A</b>	<b>15,300 EGP.</b>
<b>B</b>	<b>5,540 EGP.</b>
<b>C</b>	<b>7,550 EGP.</b>
<b>D</b>	<b>13,850 EGP.</b>

**The correct answer is (C)**

**10- Share of the productions center (Y) from costs of power services center : .....**

<b>A</b>	<b>11,325 EGP.</b>
<b>B</b>	<b>6,700 EGP.</b>
<b>C</b>	<b>5,540 EGP.</b>
<b>D</b>	<b>8,310 EGP.</b>

**The correct answer is (A)**

**11- allocation rate - (X) center : .....**

<b>A</b>	<b>4.797 EGP per machine-hour.</b>
<b>B</b>	<b>4.52 EGP per machine-hour.</b>
<b>C</b>	<b>20.373 EGP Per direct labor hour.</b>
<b>D</b>	<b>20.125 EGP Per direct labor cost.</b>

**The correct answer is (B)**



**12- allocation rate - (Y) center : .....**

<b>A</b>	<b>4.797 EGP per machine-hour.</b>
<b>B</b>	<b>5.350 EGP per machine-hour.</b>
<b>C</b>	<b>20.373 EGP Per direct labor costs.</b>
<b>D</b>	<b>21.625 EGP Per direct labor hour.</b>

**The correct answer is (D)**

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

A	41,910 EGP.
B	45,200 EGP.
C	13,810 EGP.
D	50,000 EGP.

**The correct answer is (B)**

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

<b>A</b>	<b>43,250 EGP.</b>
<b>B</b>	<b>46,540 EGP.</b>
<b>C</b>	<b>13,810 EGP.</b>
<b>D</b>	<b>50,000 EGP.</b>

**The correct answer is (A)**

**15- Share of the (Y) center from lighting expenses : .....**

<b>A</b>	<b>100 EGP.</b>
<b>B</b>	<b>2,400 EGP.</b>
<b>C</b>	<b>200 EGP.</b>
<b>D</b>	<b>6,000 EGP.</b>

**The correct answer is (A)**

**16- Share of the Power center from heating costs : .....**

<b>A</b>	<b>100 EGP.</b>
<b>B</b>	<b>2,400 EGP.</b>
<b>C</b>	<b>200 EGP.</b>
<b>D</b>	<b>6,000 EGP.</b>

**The correct answer is (C)**

**17- Share of warehouse center from buildings insurance costs : .....**

<b>A</b>	<b>100 EGP.</b>
<b>B</b>	<b>2,400 EGP.</b>
<b>C</b>	<b>200 EGP.</b>
<b>D</b>	<b>1,500 EGP.</b>

**The correct answer is (D)**

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*Thanks*

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