Guiding Forms of Test Bank

Subject/ Cost Accounting 2

Year/ 3- English Section

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Chapter (1): Accounting for indirect manufacturing costs

First: true (√) & false (x) questions:

1	The cost of any product includes two basic elements: materials and wages only	x
2	Indirect costs are those costs that are easily traced to unit product	x
3	Direct costs are those costs that are difficult to trace to unit product.	x
4	Indirect costs are those costs that the enterprise incurs to produce a unit of production on its own.	x
5	The cost elements are classified according to their relationship to the unit of activity into two types: "variable costs and fixed costs."	x
6	Capital services centers represent administrative units in which goods and equipment are produced for use within the company.	√
7	Fixed costs are those that change directly with the change in the volume of activity.	x
8	Industrial indirect costs represent all other industrial costs other than direct materials only.	x
9	Industrial indirect costs represent non-homogeneous or similar cost components.	√
10	The department of performing a homogeneous specific activity or homogeneous services of a specific type representing the cost center.	√
11	Indirect costs are the main problem facing the costs accountants Because it includes many different items of different origins and behavior.	√
12	Cost accounting is mainly based on Preparing the financial statements.	x
13	The prime cost means the total cost of direct materials and direct labor.	√
14	The conversion cost means the total cost of direct labor and indirect manufacturing costs.	√
15	Cost accounting is mainly based on Recording, disclosing, and measuring costs related to providing a service or producing a commodity.	√
16	The prime cost means the total cost of direct materials and indirect labor.	x
17	The step-down allocation method ignores the services exchanged between the productive services center.	√

18	Indirect costs that are difficult to trace and allocate to the product.	√
19	Determining allocation rate for each production center is considered one of the steps in determining the share of the product unit from the indirect manufacturing costs.	√
20	Dividing the company into production centers and service centers. is considered one of the steps in determining the share of the product unit from the direct manufacturing costs.	x
21	Production centers represent administrative or natural units in which all cost elements are formed and transferred to final product.	√
22	Capital operations centers represent administrative or natural units based on serving production centers.	x
23	Indirect costs that are easy to distinguish and allocate to the production unit	x
24	Dividing the company into production centers and service centers. is considered one of the steps in determining the share of the product unit from the indirect manufacturing costs.	√
25	Direct costs that are easy to distinguish and allocate to the production unit	√
26	Production service centers represent administrative or natural units based on serving production centers.	√
27	Administrative and Financial Services Centers represent administrative units in which all administrative and financing services are performed for all other centers in the enterprises	√
28	The total allocation method is based on allocating the costs of all service centers and distributing them to the benefiting productive centers	√
29	The method of total allocation is characterized by ease and simplicity.	√
30	The direct allocation method is based on allocating the costs of each service center separately to the beneficiary production centers only.	√
31	Marketing services centers represent administrative units in which all administrative and financing services are performed for all other centers in the enterprises	x
32	The step-down allocation method is based on allocating the costs of each service center separately to the beneficiary production centers only.	x
33	The reciprocal allocation method is not limited only to what a	√

	service center can perform to another service center, but rather extends to what can be done between them in terms of exchange of services	
34	The step-down allocation method is based on arranging production service centers in descending order according to their service to other centers and their relative importance.	√
35	The reciprocal allocation method was distinguished from other allocation methods in that it effectively applied the idea of exchanging services between different production service centers.	√
36	The reciprocal allocation method was limited to allocating the costs of production service centers to production centers only, and there is a very high probability that the service center would perform its services to another service center.	x
37	The direct allocation method is considered the most widely used method in the practical field, especially in enterprises where the number of centers increases, and the units of the final product are varied and multiple.	x
38	Marketing services centers represent administrative units in which the firm's products are distributed and disposed of and delivered to the final consumer at the appropriate time and place.	√
39	The step-down allocation method is based on allocating the costs of all service centers and distributing them to the benefiting productive centers.	x
40	Share unit of the indirect manufacturing costs from production center = share unit from allocation basis multiplied by allocation rate.	√

Second: Choose the correct answer:

Example (1): The following data were extracted from Celia Co. cost books and records:

- Production passes through tow production centers (X, Y) and two services centers (power, warehouses).
- Estimated indirect manufacturing costs for (2022) 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

- **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	-

- 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.

After Preparing a statement of the allocation of the estimated indirect manufacturing costs using the total allocation method based on direct labor hours. And determining allocation rate to production centers. Choose the correct answer as following:

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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

A 3,000 EGP. B 1,500 EGP.

C 2,400 EGP. D 6,000 EGP.

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

A 100 EGP. B 2,400 EGP.

C 200 EGP. D 6,000 EGP.

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

A 100 EGP. B 2,400 EGP.

C 200 EGP. D 6,000 EGP.

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

A 100 EGP. B 2,400 EGP.

C 200 EGP. D 1,500 EGP.

Example (2): The following data were extracted from Celia Co. cost books and records:

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

- Estimated indirect manufacturing costs for (2022) 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

- **Estimated activity level and allocation basis:**

Desc.	X	Y	power	warehouses
buildings value	٦0,000	50,000	40,000	30,000
Area in square meters	200	150	50	100
Number of machine hours	١٠,000	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	-

- 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.

After Preparing a statement of the allocation of the estimated indirect manufacturing costs using the direct allocation method using power center allocated based on machine hours, Warehouses allocated based on materials issued. Choose the correct answer as following:

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

A 27,600 EGP. B 20,100 EGP.

C 45,850 EGP. D 28,900 EGP.

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

A 27,600 EGP. B 26,900 EGP.

C 13,850 EGP. D 28,900 EGP.

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

A 46,900 EGP. B 45,900 EGP.

C 20,100 EGP. D 88,450 EGP.

19- The Total indirect manufacturing costs before allocated to services centers in production center (Y): ……

A 27,600 EGP. B 26,900 EGP.

C 20,100 EGP. D 13,850 EGP.

20-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.

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

A 13,580 EGP. B 26,900 EGP.

C 20,370 EGP. D 13,400 EGP.

22- Share of the productions center (X) from costs of power services center: ……..

A 15,300 EGP. B 5,540 EGP.

C 20,450 EGP. D 13,850 EGP.

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

A 13,400 EGP. B 6,700 EGP.

C 5,540 EGP. D 8,310 EGP.

24- Share of the productions center (Y) from costs of power services center: ….

A 13,400 EGP. B 6,700 EGP.

C 5,540 EGP. D 8,310 EGP.

25- allocation rate - (X) center: ……

A 4.797 EGP per machine-hour. B 4.654 EGP per machine-hour.

C 20.373 EGP Per direct labor hour. D 20.125 EGP Per direct labor cost.

26- 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 20.955 EGP Per direct labor hour.

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

A 41,910 EGP. B 46,540 EGP.

C 13,810 EGP. D 50,000 EGP.

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

A 41,910 EGP. B 46,540 EGP.

C 13,810 EGP. D 50,000 EGP.

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

A 3,000 EGP. B 1,500 EGP.

C 2,400 EGP. D 6,000 EGP.

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

A 100 EGP. B 2,400 EGP.

C 200 EGP. D 6,000 EGP.

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

A 100 EGP. B 2,400 EGP.

C 200 EGP. D 1,500 EGP.

Example (3): The following data were extracted from Celia Co. cost books and records:

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

- Estimated indirect manufacturing costs for (2022) 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

- **Estimated activity level and allocation basis:**

Desc.	X	Y	power	warehouses
buildings value	٦0,000	50,000	40,000	30,000
Area in square meters	200	150	50	100
Number of machine hours	١٠,000	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	-

- 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.

After 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. Assuming the warehouses center serves the largest number of production and service centers. Choose the correct answer as following:

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

A 27,600 EGP. B 20,100 EGP.

C 45,850 EGP. D 28,900 EGP.

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

A 27,600 EGP. B 26,900 EGP.

C 13,850 EGP. D 28,900 EGP.

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

A 46,900 EGP. B 45,900 EGP.

C 20,100 EGP. D 88,450 EGP.

35- Total indirect manufacturing costs before allocated to services centers in production center (Y): ……

A 27,600 EGP. B 26,900 EGP.

C 20,100 EGP. D 13,850 EGP.

36-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.

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

A 13,580 EGP. B 26,900 EGP.

C 20,370 EGP. D 10,050 EGP.

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

A 13,580 EGP. B 5,025 EGP.

C 20,370 EGP. D 10,050 EGP.

39- Share of the power services center from costs of warehouses services center: ……

A 13,580 EGP. B 5,025 EGP.

C 20,370 EGP. D 10,050 EGP.

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

A 15,300 EGP. B 5,540 EGP.

C 7,550 EGP. D 13,850 EGP.

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

A 11,325 EGP. B 6,700 EGP.

C 5,540 EGP. D 8,310 EGP.

42- allocation rate - (X) center: ……

A 4.797 EGP per machine-hour. B 4.52 EGP per machine-hour.

C 20.373 EGP Per direct labor hour. D 20.125 EGP Per direct labor cost.

43- 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 21.625 EGP Per direct labor hour.

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

A 41,910 EGP. B 46,540 EGP.

C 13,810 EGP. D 45,200 EGP.

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

A 43,250 EGP. B 46,540 EGP.

C 13,810 EGP. D 50,000 EGP.

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

A 3,000 EGP. B 1,500 EGP.

C 2,400 EGP. D 6,000 EGP.

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

A 100 EGP. B 2,400 EGP.

C 200 EGP. D 6,000 EGP.

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

A 100 EGP. B 2,400 EGP.

C 200 EGP. D 1,500 EGP.

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

A 100 EGP. B 2,400 EGP.

C 200 EGP. D 1,500 EGP.

Example (4): Adam Co. consists of two production centers (cutting and knitting), two service centers, (power and warehouses). The following data were extracted from the factory cost books and records:

- Analysis of the services provided by the Service Center:

Desc.	beneficiary centers			
	Cutting	Knitting	Power	warehouses
Warehouses center	30%	30%	40%	-----
Power center	10%	40%	---	50%

- Estimated indirect manufacturing costs and allocation basis:

Desc.	Cutting	Knitting	Power	warehouses
(MOH) From special costs	45,000	35,000	4,500	13,000
(MOH) From general costs	55,000	15,000	5,500	7,000
Machine hours	5,000	4,000	1,500	---
Direct labor hours	2,000	5,000	---	500

- The rate of indirect manufacturing costs allocated to production centers is determined based on machine hours at cutting center, direct labor hours at knitting center.

After Preparing a statement of the allocation of the estimated indirect manufacturing costs using the reciprocal allocation method. Choose the correct answer as following:

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

A 20,000 EGP. B 10,000 EGP.

C 100,000 EGP. D 50,000 EGP.

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

A 20,000 EGP. B 10,000 EGP.

C 100,000 EGP. D 50,000 EGP.

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

A 97,500 EGP. B 180,000 EGP.

C 82,500 EGP. D 150,000 EGP.

53- Total indirect manufacturing costs of the cutting center before allocation costs of services centers: ……

A 97,500 EGP. B 180,000 EGP.

C 100,000 EGP. D 150,000 EGP.

54- Total indirect manufacturing costs of the knitting center before allocation costs of services centers: ……

A 50,000 EGP. B 180,000 EGP.

C 100,000 EGP. D 150,000 EGP.

55- Share of the cutting center from costs of warehouses services center: ……

A 9,375 EGP. B 12,500 EGP.

C 11,250 EGP. D 2,250 EGP.

56- Share of the knitting center from costs of warehouses services center: ….

A 9,375 EGP. B 12,500 EGP.

C 11,250 EGP. D 2,250 EGP.

57- Share of the power center from costs of warehouses services center: ……

A 9,375 EGP. B 12,500 EGP.

C 11,250 EGP. D 2,250 EGP.

58- Share of the cutting center from costs of power services center: ……..

A 9,375 EGP. B 12,500 EGP.

C 11,250 EGP. D 2,250 EGP.

59- Share of the knitting center from costs of power services center: ……..

A 9,375 EGP. B 12,500 EGP.

C 9,000 EGP. D 2,250 EGP.

60- Share of the warehouses center from costs of power services center: …

A 9,375 EGP. B 12,500 EGP.

C 11,250 EGP. D 2,250 EGP.

61- Total indirect manufacturing costs of the cutting center after allocation costs of services centers: …….

A 100,000 EGP. B 68,375 EGP.

C 180,000 EGP. D 111,625 EGP.

62- Total indirect manufacturing costs of the knitting center after allocation costs of services centers: …….

A 100,000 EGP. B 68,375 EGP.

C 180,000 EGP. D 111,625 EGP.

63- allocation rate - Cutting center: ……

A 21.523 EGP per machine-hour. B 22.325 EGP per machine-hour.

C 13.675 EGP Per direct labor hour. D 20.125 EGP Per direct labor cost.

64- allocation rate - Knitting center: ……

A 22.797 EGP per machine-hour. B 13.050 EGP per machine-hour.

C 12.373 EGP Per direct labor hour. D 13.675 EGP Per direct labor hour.

Example (5): Adam's gloves factory has two service centers, Warehouse and Data Center, and two production centers, cutting and knitting. Warehouse center costs are allocated based on area in square meters. Data Center costs are allocated based on the number of computer log-on hours. Data on costs and allocation bases are as follows:

Items Costs	Production Centers		Service Centers	
	Cutting	Knitting	Data	warehouses
Budgeted costs (EGP)	125,000	150,000	75,000	175,000
Warehouses-area in square maters	500	750	250	NA
Number of computer hours	400	600	NA	100
Direct labor hours (allocation base for Cutting)	4,000	2,500	---	---
Machine hours (allocation base for Knitting)	8,000	17,000	---	---

After Preparing a statement of the allocation of the estimated indirect manufacturing costs using the total allocation method based on machine hours. And determining allocation rate to production centers. Choose the correct answer as following:

65- Allocation rate - Cutting center: ……

A 18.824 EGP per machine-hour. B 51.25 EGP per direct labor hour.

C 50.75 EGP Per direct labor hour. D 19.801 EGP Per machine-hour.

66- Allocation rate - knitting center: ……

A 18.824 EGP per machine-hour. B 51.25 EGP per direct labor hour.

C 50.75 EGP Per direct labor hour. D 19.801 EGP Per machine-hour.

67- Total indirect manufacturing costs of the Cutting center after allocation costs of services centers: ……

A 250,000 EGP. B 320,000 EGP.

C 205,000 EGP. D 525,000 EGP.

68- Total indirect manufacturing costs of the Knitting center after allocation costs of services centers: ……

A 250,000 EGP. B 320,000 EGP.

C 205,000 EGP. D 525,000 EGP.

69- Total estimated indirect manufacturing costs of Adam Co. as a whole: …

A 250,000 EGP. B 320,000 EGP.

C 205,000 EGP. D 525,000 EGP.

70- Share of the cutting productions center from costs of services center: …

A 250,000 EGP. B 320,000 EGP.

C 170,000 EGP. D 80,000 EGP.

71- Share of the knitting productions center from costs of services center: …

A 250,000 EGP. B 320,000 EGP.

C 170,000 EGP. D 80,000 EGP.

Example (6): Adam's gloves factory has two service centers, Warehouse and Data Center, and two production centers, cutting and knitting. Warehouse center costs are allocated based on area in square meters. Data Center costs are allocated based on the number of computer log-on hours. Data on costs and allocation bases are as follows:

Items Costs	Production Centers		Service Centers	
	Cutting	**Knitting**	**Data**	**warehouses**
Budgeted costs (EGP)	125,000	150,000	75,000	175,000
Warehouses-area in square maters	500	750	250	NA
Number of computer hours	400	600	NA	100
Direct labor hours (allocation base for Cutting)	4,000	2,500	---	---
Machine hours (allocation base for Knitting)	8,000	17,000	---	---

After Preparing a statement of the allocation of the estimated indirect manufacturing costs using the direct allocation method based on machine hours. And determining allocation rate to production centers. Choose the correct answer as following:

72- Allocation rate - Cutting center: ……

A 18.824 EGP per machine-hour. B 56.25 EGP per direct labor hour.

C 50.75 EGP Per direct labor hour. D 19.801 EGP Per machine-hour.

73- Allocation rate - knitting center: ……

A 17.647 EGP per machine-hour. B 51.25 EGP per direct labor hour.

C 50.75 EGP Per direct labor hour. D 19.801 EGP Per machine-hour.

74- Total indirect manufacturing costs of the Cutting center after allocation costs of services centers: ……

A 250,000 EGP. B 320,000 EGP.

C 225,000 EGP. D 525,000 EGP.

75- Total indirect manufacturing costs of the Knitting center after allocation costs of services centers: ……

A 250,000 EGP. B 300,000 EGP.

C 205,000 EGP. D 525,000 EGP.

76- Total estimated indirect manufacturing costs of Adam Co. as a whole: …

A 250,000 EGP. B 320,000 EGP.

C 205,000 EGP. D 525,000 EGP.

77- Share of the cutting production center from costs of warehouses services center: ……

A 45,000 EGP. B 30,000 EGP.

C 105,000 EGP. D 70,000 EGP.

78- Share of the knitting production center from costs of warehouses services center: ……

A 45,000 EGP. B 30,000 EGP.

C 105,000 EGP. D 70,000 EGP.

79- Share of the cutting production center from costs of Data services center: ……

A 45,000 EGP. B 30,000 EGP.

C 105,000 EGP. D 70,000 EGP.

80- Share of the knitting production center from costs of Data services center: …..

A 45,000 EGP. B 30,000 EGP.

C 105,000 EGP. D 70,000 EGP.

81- Share of the knitting production center from costs of all services center: …...

A 45,000 EGP. B 145,000 EGP.

C 105,000 EGP. D 150,000 EGP.

Example (7): Adam's gloves factory has two service centers, Warehouse and Data Center, and two production centers, cutting and knitting. Warehouse center costs are allocated based on area in square meters. Data Center costs are allocated based on the number of computer log-on hours. Data on costs and allocation bases are as follows:

Items Costs	Production Centers		Service Centers	
	Cutting	Knitting	Data	warehouses
Budgeted costs (EGP)	125,000	150,000	75,000	175,000
Warehouses-area in square maters	500	750	500	NA
Number of computer hours	450	800	NA	100
Direct labor hours (allocation base for Cutting)	4,000	2,500	---	---
Machine hours (allocation base for Knitting)	8,000	17,000	---	---

After Preparing a statement of the allocation of the estimated indirect manufacturing costs using the step-down allocation method assuming the warehouses center is serving the largest number of production and service centers. And determining allocation rate to production centers. Choose the correct answer as following:

82- Allocation rate - Cutting center: ……

A 18.824 EGP per machine-hour. B 55.00 EGP per direct labor hour.

C 50.75 EGP Per direct labor hour. D 19.801 EGP Per machine-hour.

83- Allocation rate - knitting center: ……

A 17.647 EGP per machine-hour. B 51.25 EGP per direct labor hour.

C 50.75 EGP Per direct labor hour. D 17.941 EGP Per machine-hour.

84- Total indirect manufacturing costs of the Cutting center after allocation costs of services centers: ……

A 250,000 EGP. B 320,000 EGP.

C 220,000 EGP. D 525,000 EGP.

85- Total indirect manufacturing costs of the Knitting center after allocation costs of services centers: ……

A 250,000 EGP. B 305,000 EGP.

C 205,000 EGP. D 525,000 EGP.

86- Total estimated indirect manufacturing costs of Adam Co. as a whole: …

A 250,000 EGP. B 320,000 EGP.

C 205,000 EGP. D 525,000 EGP.

87- Share of the cutting production center from costs of warehouses services center: ……

A 45,000 EGP. B 30,000 EGP.

C 50,000 EGP. D 70,000 EGP.

88- Share of the knitting production center from costs of warehouses services center: ……

A 45,000 EGP. B 30,000 EGP.

C 50,000 EGP. D 75,000 EGP.

89- Share of the cutting production center from costs of Data services center: …...

A 45,000 EGP. B 30,000 EGP.

C 50,000 EGP. D 75,000 EGP.

90- Share of the knitting production center from costs of Data services center: ……

A 45,000 EGP. B 80,000 EGP.

C 50,000 EGP. D 75,000 EGP.

91- Share of the data services center from costs of warehouses services center: ……

A 45,000 EGP. B 80,000 EGP.

C 50,000 EGP. D 75,000 EGP.

Example (8): Production jobs in manufacturing companies pass through two production centers. If you know the following:

- At the beginning of the month the company estimated that:

Desc.	First center	Second center
Direct labor hours	10,000 hours	6,000 hours
Machine hours	20,000 hours	30,000 hours
Direct labor cost	150,000 EGP	100,000 EGP
Indirect manufacturing cost	180,000 EGP	120,000 EGP

- Direct labor cost is used to determine the allocation rate for the first center, and the machine hours for the second center.
- Data related to Job number (325):

Desc.	First center	Second center
Direct materials	250 EGP	200 EGP
Direct labor	300 EGP	400 EGP
Machine hours	20 hours	25 hours
Direct labor hours	16 hours	10 hours

- The number of units produced for the production job is 300 units.

After Determine the estimated allocation rate of indirect manufacturing costs for each of the two production centers. And determine the cost of the production job number (325). Choose the correct answer as following:

92- Allocation rate - first center: ……

A 4 EGP per EGP direct labor. B 1.2 EGP per EGP direct labor.

C 4 EGP per machine hour. D 1.2 EGP per direct labor hour.

93- Allocation rate - second center: ……

A 4 EGP per EGP direct labor. B 1.2 EGP per EGP direct labor.

C 4 EGP per machine hour. D 1.2 EGP per direct labor hour.

94- Total costs of production job: ……

A 460 EGP. B 1,150 EGP.

C 360 EGP. D 1,610 EGP.

95- Prime costs of production job: ……

A 460 EGP. B 1,150 EGP.

C 12,500 EGP. D 1,610 EGP.

96- Share of the production job No. (325) from the indirect manufacturing costs - first center: ……

A 460 EGP. B 1,150 EGP.

C 360 EGP. D 1,610 EGP.

97- Share of the production job No. (325) from the indirect manufacturing costs - second center: ……

A 460 EGP. B 100 EGP.

C 360 EGP. D 1,610 EGP.

98- Conversion costs of production job No. (325): ……

A 1,160 EGP. B 1,150 EGP.

C 360 EGP. D 1,610 EGP.

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

A 120,000 EGP. B 180,000 EGP.

C 1,610 EGP. D 300,000 EGP.

100- Cost of unit produced from the job production No. (325): ……..

A 6.23 EGP unit. B 5.36 EGP per direct labor hour.

C 5.36 EGP per unit. D 5.36 EGP per unit.

101- Total indirect manufacturing cost in production job No. (325): ……...

A 460 EGP. B 100 EGP.

C 360 EGP. D 1,610 EGP.

Example (9): Shaheen Co. consists of two production centers (cutting and knitting), two service centers, (power and warehouses). The following data were extracted from the factory cost books and records:

- Estimated indirect manufacturing costs and allocation basis:

Desc.	Cutting	Knitting	Power	Warehouses
(MOH) From special costs	90,000	70,000	9,000	16,000
(MOH) From general costs	110,000	30,000	11,000	14,000
Direct materials issued (allocation base for warehouses)	3,000	3,000	4,000	---
Machine hours (allocation base for power)	2,000	8,000	--	10,000
Direct labor hours	7,500	5,000	1,000	3,000

- The rate of indirect manufacturing costs allocated to production centers is determined based on Direct labor hours at cutting center, machine hours at knitting center.

After Preparing a statement of the allocation of the estimated indirect manufacturing costs using the reciprocal allocation method. Choose the correct answer as following:

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

A 30,000 EGP. B 10,000 EGP.

C 100,000 EGP. D 50,000 EGP.

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

A 20,000 EGP. B 10,000 EGP.

C 100,000 EGP. D 50,000 EGP.

104- Total estimated indirect manufacturing costs of Shaheen Co. as a whole:

A 97,500 EGP. B 350,000 EGP.

C 82,500 EGP. D 150,000 EGP.

105- Total indirect manufacturing costs of the cutting center before allocation costs of services centers: …...

A 97,500 EGP. B 180,000 EGP.

C 200,000 EGP. D 150,000 EGP.

106- Total indirect manufacturing costs of the knitting center before allocation costs of services centers: …...

A 100,000 EGP. B 180,000 EGP.

C 100,000 EGP. D 150,000 EGP.

107- Share of the cutting center from costs of warehouses services center: …

A 15,000 EGP. B 12,500 EGP.

C 11,250 EGP. D 2,250 EGP.

108- Share of the knitting center from costs of warehouses services center: …

A 15,000 EGP. B 12,500 EGP.

C 11,250 EGP. D 2,250 EGP.

109- Share of the power center from costs of warehouses services center: …..

A 9,375 EGP. B 20,000 EGP.

C 11,250 EGP. D 2,250 EGP.

110- Share of the cutting center from costs of power services center: ……..

A 9,375 EGP. B 12,500 EGP.

C 11,250 EGP. D 4,000 EGP.

111- Share of the knitting center from costs of power services center: ……..

A 9,375 EGP. B 12,500 EGP.

C 16,000 EGP. D 2,250 EGP.

112- Share of the warehouses center from costs of power services center: …

A 9,375 EGP. B 12,500 EGP.

C 20,000 EGP. D 2,250 EGP.

113- Total indirect manufacturing costs of the cutting center after allocation costs of services centers: …….

A 100,000 EGP. B 68,375 EGP.

C 180,000 EGP. D 219,000 EGP.

114- Total indirect manufacturing costs of the knitting center after allocation costs of services centers: …….

A 100,000 EGP. B 131,000 EGP.

C 180,000 EGP. D 111,625 EGP.

115- allocation rate - Cutting center: ……

A 21.523 EGP per machine-hour. B 22.325 EGP per machine-hour.

C 29.2 EGP Per direct labor hour. D 20.125 EGP Per direct labor cost.

116- allocation rate - Knitting center: ……

A 22.797 EGP per machine-hour. B 13.050 EGP per machine-hour.

C 12.373 EGP Per direct labor hour. D 16.375 EGP Per machine hour.

Example (10): **The following is The statement of allocation the estimated indirect manufacturing costs for Rameshka company:**

Items Costs	Production Centers		Service Centers			Total
	X	Y	Data	power	warehouses	
Cost of centers:						
Indirect materials	16,000	12,000	6,000	10,000	6,000	???
Indirect labors	2,000	16,000	10,000	14,000	8,000	???
Depreciation	24,000	16,000	6,000	10,000	2,000	???
General (shared) costs:						
Factory rent	4,800	3,600	1,200	2,400	3,000	???
Lighting expenses	400	200	100	200	300	???
Heating	2,000	1,000	400	600	500	???
Buildings insurance	6,000	5,000	4,000	3,000	7,000	???
Total estimated (MOH)	???	???	???	???	???	???
Allocation warehouses center	8,040	10,720	2,680	5,360		
Allocation power center	18,224	22,780	4,556			
Allocation Data center	20,436	14,500				
Total estimated (MOH)	???	???				???
Allocation basis	÷ 10,000	÷ 5,000				
Allocation rate	???	???				

If you know that The rate is determined based on machine-hours at (X) production center, direct labor hours at (Y) production center. Choose the correct answer:

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

A 55,200 EGP. B 26,800 EGP.

C 101,900 EGP. D 203,700 EGP.

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

A 55,200 EGP. B 53,800 EGP.

C 101,900 EGP. D 203,700 EGP.

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

A 27,600 EGP. B 26,800 EGP.

C 20,100 EGP. D 28,900 EGP.

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

A 27,700 EGP. B 26,800 EGP.

C 20,100 EGP. D 40,200 EGP.

121- Total costs of Data center from general and special costs: ……

A 27,700 EGP. B 26,800 EGP.

C 20,100 EGP. D 40,200 EGP.

122- Share of the productions center (X) from costs of Power center: ……

A 14,500 EGP. B 40,200 EGP.

C 22,780 EGP. D 18,224 EGP.

123- Share of the productions center (Y) from costs of Power center: ……

A 14,500 EGP. B 40,200 EGP.

C 22,780 EGP. D 18,224 EGP.

124- Share of the Data center from costs of Power center: ……

A 27,700 EGP. B 4,556 EGP.

C 2,680 EGP. D 5,360 EGP.

125- Share of the productions center (Y) from costs of Data center: ……

A 14,500 EGP. B 27,700 EGP.

C 20,436 EGP. D 26,800 EGP.

126- Share of the productions center (Y) from costs of warehouses center: ……

A 10,720 EGP. B 2,680 EGP.

C 8,040 EGP. D 5,360 EGP.

127- Share of the Power center from costs of warehouses center: ……

A 10,720 EGP. B 2,680 EGP.

C 8,040 EGP. D 5,360 EGP.

128- Share of the Data center from costs of warehouses center: ……

A 10,720 EGP. B 2,680 EGP.

C 8,040 EGP. D 5,360 EGP.

129- Total estimated indirect manufacturing costs of Rameshka Co. as a whole: ……

A 101,900 EGP. B 203,700 EGP.

C 204,450 EGP. D 101,800 EGP.

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

A 101,900 EGP. B 203,700 EGP.

C 204,450 EGP. D 101,800 EGP.

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

A 101,900 EGP. B 203,700 EGP.

C 204,450 EGP. D 101,800 EGP.

132- Allocation rate - (X) center: ……

A 10.19 EGP per machine-hour. B 12.350 EGP per machine-hour.

C 20.373 EGP Per direct labor hour. D 20.125 EGP Per direct labor cost.

133- Allocation rate - (Y) center: ……

A 10.797 EGP per machine-hour. B 11.350 EGP per machine-hour.

C 20.36 EGP Per direct labor hour. D 21.180 EGP Per direct labor cost.

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

A 3,000 EGP. B 1,500 EGP.

C 2,400 EGP. D 4,800 EGP.

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

A 100 EGP. B 2,400 EGP.

C 200 EGP. D 6,000 EGP.

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

A 100 EGP. B 2,400 EGP.

C 200 EGP. D 6,00 EGP.

Example (1): Alfred, owner of Hi-Tech Fiberglass Fabricators, Inc., is interested in using the reciprocal allocation method. The following data from operations were collected for analysis:

- **Budgeted manufacturing overhead costs:**

Plant Maintenance PM (service center)	350,000 EGP
Data Processing DP (service center)	75,000 EGP
Machining M (production center)	225,000 EGP
Capping C (production center)	125,000 EGP

- **Services furnished:**

By Plant Maintenance (budgeted labor-hours (11,500 hours)):
- ✓ to Data Processing 4,600
- ✓ to Machining ?
- ✓ to Capping 3,450

By Data Processing (budgeted computer time):
- ✓ to Plant Maintenance 2,350
- ✓ to Machining 1,880
- ✓ to Capping 470

❑ **Required:**

1. **Prepare the cost allocation statement of service centers to the production centers using the reciprocal allocation method.**
2. **Compute the allocation rate if you knew that, machining department allocated based on machine hours (7000 hours), Capping department allocated based on direct materials costs (558,375 EGP).**
3. **The actual production of job order (No.610) is 5,000 units, the unit of the product required three hours of machines hours in Machining Center, and the value of 12 pounds for direct materials in Capping Center. Determine the production share of the indirect manufacturing costs.**

Solution

1- Analysis of the services provided by the Services Centers:

- ❑ Cost of Plant Maintenance center allocation based on direct labor-hours
- ❑ Cost of Data Processing center allocation based on computer time.

Desc.	beneficiary centers			
	M	C	PM	DP
PM	= (3450 ÷11500) **= 30%**	= (3450 ÷11500) **= 30%**	------	= (4600 ÷11500) **= 40%**
DP	= (1880 ÷ 4700) **= 40%**	= (470 ÷ 4700) **= 10%**	= (2350 ÷ 4700) = **50%**	----

2- Determine the cost allocation of production service centers:

Plant Maintenance (PM)	**Data Processing** (DP)
350,000	75,000
+ 50% from (DP)	+ 40% from (PM)
PM = 350,000 + 0.50 DP (First equation)	DP = 75,000 + 0.40 PM (Second equation)

And by substitution in the first equation:

PM = 350,000 + 0.50 DP
PM = 350,000 + 0.50 (75,000 + 0.40 PM)
PM = 350,000 + 37,500 + 0.20 PM
PM = 387,500 + 0.20 PM
0.80 PM = 387,500
Plant Maintenance (PM) = 484,375 EGP

And by substitution in the second equation:

DP = 75,000 + 0.40 PM
DP = 75,000 + (0.40 x 484,375)
DP = 75,000 + 193,750
Data Processing (DP) = 268,750 EGP

3- Allocation the cost of services centers to production centers as following:

- The centers, share from the cost of **Plant Maintenance** services center:
  - ✓ Share of **M** center = 484,375 x 30% = 145,312.5 EGP.
  - ✓ Share of **C** center = 484,375 x 30% = 145,312.5 EGP.
  - ✓ Share of **DP** center = 484,375 x 40% = 193,750 EGP

- The centers, share from the cost of **Data Processing** services center:
  - ✓ Share of **M** center = 268,750 x 40% = 107,500 EGP.
  - ✓ Share of **C** center = 268,750 x 10% = 26,875 EGP.
  - ✓ Share of **PM** center = 268,750 x 50% = 134,375 EGP

Frist: Allocation of the estimated indirect manufacturing costs statement:

Items Costs	Production Centers		Service Centers		Total
	M	C	PM	DP	
Budgeted MOH costs	225,000	125,000	350,000	75,000	775,000
Allocation PM center	145,312.5	145,312.5	**(484,375)**	193,750	
Allocation DP center	107,500	26,875	134,375	**(268,750)**	
Total	**477,812.5**	**279,187.5**			**775,000**

Second: Compute the allocation rate:

Allocation rate - **M** center = 477,812.5 ÷ 7,000 = **68.259 EGP per machine hour.**

Allocation rate - **C** center = 279,187.5 ÷ 558,375 = **0.50 EGP per EGP direct materials.**

Third: Determine the production of job order (No.610) share of the indirect manufacturing costs:

From **M** center = 5,000 x 3 x 68.259 = 1,023,885 **EGP.**

From **C** center = 5,000 x 12 x 0.50 = 30,000 **EGP.**

Total = 1,023,885 + 30,000 = 1,053,885 EGP.

Example (2): **Gotham University offers only high-tech graduate-level programs. Gotham has two principal production departments, Engineering and Computer Sciences, and two service departments, Facility and Technology Maintenance and Enrollment Services. The base used to allocate facility and technology maintenance is budgeted total maintenance hours. The base used to allocate enrollment services is number of credit hours for a department. The Facility and Technology Maintenance budget is $350,000, while the Enrollment Services budget is $950,000. The following chart summarizes budgeted amounts and allocation-base amounts used by each department:**

	Services Provided: (Annually)				
	Budget	**Engineering**	**Computer Sciences**	**F&T Maintenance**	**Enrollment Service**
F&T Maintenance **(in hours)**	**$350,000**	**1,000**	**3,000**	**Zero**	**4,000**
Enrollment Service **(in credit hours)**	**$950,000**	**21,700**	**27,900**	**12,400**	**Zero**

Required:

Prepare a schedule which allocates service department costs using the reciprocal allocation method. Compute the total amount of support costs allocated to each of the two principal operating departments, Engineering and Computer Sciences.

Solution

1- Analysis of the services provided by the Services Centers:

- ❑ **Cost of F&T Maintenance center allocation based on maintenance hours**
- ❑ **Cost of Enrollment Service center allocation based on credit hours.**

Desc.	**beneficiary centers**			
	Engineering (E)	**Computer Sciences (CS)**	**F&T Maintenance (F&T)**	**Enrollment Service (ES)**
F&T	**= (1000 ÷8000) = 12.5%**	**= (3000 ÷8000) = 37.5%**	**------**	**= (4000 ÷8000) = 50%**
ES	**= (21700 ÷ 62000) = 35%**	**= (27900 ÷ 62000) = 45%**	**= (12400 ÷ 62000) = 20%**	**----**

2- Determine the cost allocation of production service centers:

F&T Maintenance (F&T)	Enrollment Service (ES)
350,000	950,000
+ 20% from (ES)	+ 50% from (F&T)
F&T = 350,000 + 0.20 ES (First equation)	ES = 950,000 + 0.50 F&T (Second equation)

And by substitution in the first equation:

F&T = 350,000 + 0.20 ES

F&T = 350,000 + 0.20 (950,000 + 0.50 F&T)

F&T = 350,000 + 190,000 + 0.10 F&T

F&T = 540,000 + 0.10 F&T

0.90 F&T = 540,000

F&T Maintenance = 600,000 EGP

And by substitution in the second equation:

ES = 950,000 + 0.50 F&T

ES = 950,000 + (0.50 x 600,000)

ES = 950,000 + 300,000

Enrollment Service (ES)= 1,250,000 EGP

3- Allocation the cost of services centers to production centers as following:

- **The centers, share from the cost of F&T Maintenance services center:**
  - ✓ Share of E center = 600,000 x 12.5% = 75,000 EGP.
  - ✓ Share of CS center = 600,000 x 37.5% = 225,000 EGP.
  - ✓ Share of ES center = 600,000 x 50% = 300,000 EGP
- **The centers, share from the cost of Enrollment Service services center:**
  - ✓ Share of E center = 1,250,000 x 35% = 437,500 EGP.
  - ✓ Share of CS center = 1,250,000 x 45% = 562,500 EGP.
  - ✓ Share of F&T center = 1,250,000 x 20% = 250,000 EGP

4- Allocation of the estimated indirect manufacturing costs statement:

Items Costs	Production Centers		Service Centers	
	E	CS	F&T	ES
Allocation F&T center	75,000	225,000	(600,000)	300,000
Allocation ES center	437,500	562,500	250,000	(1,250,000)
Total	512,500	787,500		

Example (3): The manufacturing overhead costs allocated to the various departments in Lucia Factory were as follows:

	Operating centers			Service centers			Total
	A	B	C	X	Y	Z	
Manufacturing overhead costs allocated	17,480	27,000	25,000	13,520	7,000	10,000	100,000

- **If you have the following additional data: -**
  - **The service center (Z) provides its services to the production centers (A, B, C) and the service centers (X, Y) based on the utilization rate (40%, 20%, 20%, 10%, 10%) respectively.**
  - **Service center (X) provides its services to production centers (A, B) and service center (Y) based on the cost of indirect materials, which were (2000, 2000, 1000) for the centers, respectively.**
  - **Service center (Y), provides its services to production centers (A, B, C) and service center (X) based on the machine hours, which are (600, 400, 400, 600), respectively.**

Required:

1- **Rank the service centers, and allocate their costs to production centers according to the step-down allocation method.**
2- **Calculate the allocation rate in operating centers if you knew that:**
   - ✓ **Center (A) allocated based on 1500 direct labor hours.**
   - ✓ **Center (B) allocated based on direct labor cost of EGP 130,000,**
   - ✓ **Center (C) allocated based on the machine hours.**

Solution

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

- Share of the (A) center = 10,000 x 40% = 4,000 EGP.
- Share of the (B) center = 10,000 x 20% = 2,000 EGP.
- Share of the (C) center = 10,000 x 20% = 2,000 EGP.
- Share of the (X) services center = 10,000 x 10% = 1,000 EGP.
- Share of the (Y) services center = 10,000 x 10% = 1,000 EGP.

2- The centers, share from the cost of Y = (7,000 + 1,000) services center:

- Share of the (A) center = 8,000 x (600 ÷ 2,000) = 2,400 EGP.

- Share of the (B) center = 8,000 x (400 ÷ 2,000) = 1,600 EGP.
- Share of the (C) center = 8,000 x (400 ÷ 2,000) = 1,600 EGP.
- Share of the (X) services center = 8,000 x (600 ÷ 2,000) = 2,400 EGP.

3- The centers, share from the cost of X = (13,520 + 1,000 + 2,400) services center:

- Share of the (A) center = 16,920 x (2,000 ÷ 4,000) = 8,460 EGP.
- Share of the (B) center = 16,920 x (2,000 ÷ 4,000) = 8,460 EGP.

Frist: The statement of allocation the estimated indirect manufacturing costs:

Items Costs	Production Centers			Service Centers			Total
	A	B	C	X	Y	Z	
MOH allocated	17,480	27,000	25,000	13,520	7,000	10,000	100,000
Allocation Z center costs	4,000	2,000	1,000	1,000	1,000		
Allocation Y center costs	2,400	1,600	2,600	2,400			
Allocation X center costs	8,460	8,460					
Total (MOH)	32,340	39,060	28,600				100,000
Allocation basis	÷ 1,500	÷ 130,000	÷ 400				
Allocation rate	21.56	0.300	71.5				

Second: Determining allocation rate to production centers, as following:

- Allocation rate - (A) center = 32,340 ÷ 1,500 = 21.56 EGP per direct labor hour.
- Allocation rate - (B) center = 39,060 ÷ 130,000 = 0.300 EGP Per EGP direct labor.
- Allocation rate - (C) center = 28,600 ÷ 400 = 71.5 EGP Per machine hour.

Example (4): **Benjin Company includes two production centers (Manufacturing and Assembly) and four service centers (A, B, C, D). Below is some data about this company:**

	Production centers		Service centers				Total
	Manufacturing	Assembly	A	B	C	D	
Centers' specific costs	12,320	25,880	14,040	6,000	8,760	8,000	**75,000**
Common costs	15,000	20,000	15,000	6,000	3,000	12,000	**71,000**
Direct labor hours	1,000	3,000	-	-	-	-	**4,000**
Machine hours	4,000	1,000	3,000	500	2,000	-	**10,500**
Area / square meter	490	210	100	200	100	**16**	**1,116**
Ratio of utilization of center services (D)	-	80%	-	-	20%	-	**100%**

❑ **Additional data:**

- Service center (A) provides its services to all centers except center (D) based on the occupied area of each department,
- Center (B) provides its services based on machine hours.
- Center (C) provides its services based on direct labor hours.
- Center (D) provides its services according to the utilization rate.

❑ **Required:**

1. Prepare the allocation statement according to the direct allocation method.
2. Determine the manufacturing cost for production order **No. 150** , below are the actual available data for production order **No. 150**:

	Manufacturing	Assembly
Direct material cost	3,000	5,000
Direct labor cost	1,200	5,000
Machine hours	200	50
Direct labor hours	20	100
Nature of the production process	Mechanical	Manual

Solution

Frist: The statement of allocation the estimated indirect manufacturing costs

Items Costs	Production Centers		Service Centers				Total
	Manufacturing	Assembly	A	B	C	D	
specific costs	12,320	25,880	14,040	6,000	8,760	8,000	**75,000**
Common costs	15,000	20,000	15,000	6,000	3,000	12,000	**71,000**
MOH allocated	**27,320**	**45,880**	**29,040**	**12,000**	**11,760**	**20,000**	**146,000**
Allocation A center costs	20,328	8,712					
Allocation B center costs	9,600	2,400					
Allocation C center costs	2,940	8,820					
Allocation D center costs		20,000					
Total (MOH)	**60,188**	**85,812**					146,000
Allocation basis	÷ 4,000	÷ 3,000					
Allocation rate	**15.047**	**28.604**					

The centers, share from the cost of A services center:

- Share of the (Manufacturing) center = 29,040 x (490 ÷ 700) = 20,328 EGP.
- Share of the (Assembly) center = 29,040 x (210 ÷ 700) = 8,712 EGP.

The centers, share from the cost of B services center:

- Share of the (Manufacturing) center = 12,000 x (4,000 ÷ 5,000) = 9,600 EGP.
- Share of the (Assembly) center = 12,000 x (1,000 ÷ 5,000) = 2,400 EGP.

The centers, share from the cost of C services center:

- Share of the (Manufacturing) center = 11,760 x (1,000 ÷ 4,000) = 2,940 EGP.
- Share of the (Assembly) center = 11,760 x (3,000 ÷ 4,000) = 8,820 EGP.

The centers, share from the cost of D services center:

- Share of the (Assembly) center = 20,000 EGP.

Second: Determining allocation rate to production centers, as following:

- Allocation rate - Manufacturing center = 60,188 ÷ 4,000
  = 15.047 EGP per machine hour.
- Allocation rate - Assembly center = 85,812 ÷ 3,000
  = 28.604 EGP Per direct labor hour**.**

Third: Determine the manufacturing cost for production order No. 150:

	Manufacturing	Assembly	Total
Direct material cost	3,000	5,000	8,000
Direct labor costs	1,200	5,000	6,200
Indirect MOH costs	= 200 x 15.047 = 3,009.4	= 100 x 28.604 = 2,860.4	5,896.8
Total	**7,209.4**	**12,860.4**	**20,069.8**

Example (5):

- Production at Leonardo plant passes through two production centers (A, B) and two service centers (X, Y). The cost records data indicated that the costs paid to the security company to secure all the factory sites amounted to 900,000 pounds, allocated at 35%, 30%, 20%, 15% on the departments respectively.
- The depreciation costs of the equipment in the departments represent 10% of the value of equipment in each department.
- Here are the financial and other quantitative data:

	Production centers		Service centers	
	A	B	X	Y
Centers' specific costs	100,000	150,000	70,000	90,000
Buildings' insurance costs	40,000	55,000	25,000	15,000
Value of equipment	1,000,000	700,000	500,000	450,000
The production is based on:	Machines	Human work		

- The following information has been provided to you:
  - Service Center (X) provides its services to centers (A, B) and service center (Y) based on the cost of indirect materials which were (300, 200, 500) for the centers respectively.
  - Service Center (Y) provides its services to centers (A , B) in addition to service center (X) based on the cost of indirect labor which were (280, 320, 400) respectively.

Required:

1. Prepare a statement of allocation of service center costs to production centers using the reciprocal allocation method.
2. Calculate the allocation rate of the production centers if you knew that:
   - ✓ Machine hours are 35,000
   - ✓ Direct labor hours are 40,000

Solution

1- Analysis of the services provided by the Services Centers:

- Cost of X center allocation based on the cost of indirect materials
- Cost of Y center allocation based on the cost of indirect labor.

Desc.	beneficiary centers			
	A	B	X	Y
X	= (300 ÷1000) = 30%	= (200 ÷1000) = 20%	------	= (500 ÷1000) = 50%
Y	= (280 ÷ 1000) = 28%	= (320 ÷ 1000) = 32%	= (400 ÷ 1000) = 40%	----

2- Determine the cost allocation of production service centers:

X	Y
325,000	285,000
+ 40% from (Y)	+ 50% from (X)
X = 325,000 + 0.40 Y (First equation)	Y = 285,000 + 0.50 X (Second equation)

And by substitution in the first equation:

X = 325,000 + 0.40 Y
X = 325,000 + 0.40 (285,000 + 0.50 X)
X = 325,000 + 114,000 + 0.20 X
X = 439,000 + 0.20 X
0.80 X = 439,000
X = 548,750 EGP

And by substitution in the second equation:

Y = 285,000 + 0.50 X
Y = 285,000 + (0.50 x 548,750)
Y = 285,000 + 274,375
Y = 559,375 EGP

3- Allocation the cost of services centers to production centers as following:

- **The centers, share from the cost of X services center:**
  - ✓ Share of A center = 548,750 x 30% = 164,625 EGP.
  - ✓ Share of B center = 548,750 x 20% = 109,750 EGP.
  - ✓ Share of Y center = 548,750 x 50% = 274,375 EGP.
- **The centers, share from the cost of Y services center:**
  - ✓ Share of A center = 559,375 x 28% = 156,625 EGP.
  - ✓ Share of B center = 559,375 x 32% = 179,000 EGP.
  - ✓ Share of X center = 559,375 x 40% = 223,750 EGP.

Frist: The statement of allocation the estimated indirect manufacturing costs

Items Costs	Production Centers		Service Centers		Total
	A	B	X	Y	
specific costs	100,000	150,000	70,000	90,000	410,000
Buildings' insurance costs	40,000	55,000	25,000	15,000	135,000
Depreciation	100,000	70,000	50,000	45,000	265,000
costs of security the company	315,000	270,000	180,000	135,000	900,000
MOH allocated	555,000	545,000	325,000	285,000	1,710,000
Allocation X center costs	164,625	109,750	(548,750)	274,375	
Allocation Y center costs	156,625	179,000	223,750	(559,375)	
Total	876,250	833,750			1,710,000
Allocation base	÷ 35,000	÷ 40,000			
Allocation rate	25.0357	20.8438			

Second: Determining allocation rate to production centers, as following:

- Allocation rate - A center = 876,250 ÷ 35,000 = 25.0375 EGP per machine hour.
- Allocation rate - B center = 833,750 ÷ 40,000 = 20.8438 EGP Per direct labor hour.

Example (6): **Gotham University offers only high-tech graduate-level programs. Gotham has two principal production departments, Engineering and Computer Sciences, and two service departments, Facility and Technology Maintenance and Enrollment Services. The base used to allocate facility and technology maintenance is budgeted total maintenance hours. The base used to allocate enrollment services is number of credit hours for a department. The Facility and Technology Maintenance budget is $350,000, while the Enrollment Services budget is $950,000. The following chart summarizes budgeted amounts and allocation-base amounts used by each department:**

	Services Provided: (Annually)				
	Budget	**Engineering**	**Computer Sciences**	**F&T Maintenance**	**Enrollment Service**
F&T Maintenance **(in hours)**	**$350,000**	**1,000**	**2,000**	**Zero**	**5,000**
Enrollment Service **(in credit hours)**	**$950,000**	**24,000**	**36,000**	**2,000**	**Zero**

Required:

Prepare a schedule which allocates service department costs using the step-down method with the sequence of allocation based on the highest-percentage support concept. Compute the total amount of support costs allocated to each of the two principal operating departments, Engineering and Computer Sciences.

Solution

1- Allocation the cost of services centers to production centers as following:

- **The centers, share from the cost of F&T Maintenance services center:**
  - ✓ Share of E center = 350,000 x (1,000 ÷ 8,000) = 43,750 EGP.
  - ✓ Share of CS center = 350,000 x (2,000 ÷ 8,000) = 87,500 EGP.
  - ✓ Share of ES center = 350,000 x (5,000 ÷ 8,000) = 218,750 EGP.
- **The centers, share from the cost of Enrollment Service (950,000 + 218,750) services center:**
  - ✓ Share of E center = 1,168,750 x (24,000 ÷ 60,000) = 467,500 EGP.
  - ✓ Share of CS center = 1,168,750 x (36,000 ÷ 60,000) = 701,250 EGP.

2- Allocation of the estimated indirect manufacturing costs statement:

Items Costs	Production Centers		Service Centers	
	E	CS	F&T	ES
Allocation ES center	43,750	87,500	218,750	
Allocation F&T center	467,500	701,250		
Total	511,250	788,750		

Example (7): The following data were extracted from Adam Co. cost books and records:

- Production passes through tow production centers (X - Y) and two services centers (power, warehouses).
- Estimated indirect manufacturing costs for (2024) were as follows:

Desc.	X	Y	power	warehouses	Adam Co
Indirect materials	$16,000	$12,000	$6,000	$10,000	?
Indirect labor	$2,000	$16,000	$10,000	$14,000	?
Depreciation	$24,000	$16,000	$6,000	$10,000	?
Factory rent	40%	30%	?	20%	$12,000
Lighting expenses	45%	22%	11%	?	$1,000
heating	?	25%	10%	$600	$4,000
buildings insurance	30%	25%	N/A	?	$18,000

- Analysis of the services provided by the Service Center:

Desc.	beneficiary centers			
	X	Y	Power	warehouses
Warehouses center	50%	25%	25%	-----
Power center	60%	40%	---	----

- The rate of indirect manufacturing costs allocated to production centers is determined based on machine-hours (10,000 H) at (X) production center, direct labor hours (5,000 H) at (Y) production center.

Required: Preparing a statement of the allocation of the estimated indirect manufacturing costs.

Solution

Frist: The statement of allocation the estimated indirect manufacturing costs

Items Costs	Production Centers		Service Centers		Total
	X	Y	power	warehouses	
Indirect materials	$16,000	$12,000	$6,000	$10,000	$44,000
Indirect labor	$2,000	$16,000	$10,000	$14,000	$42,000
Depreciation	$24,000	$16,000	$6,000	$10,000	$56,000
Factory rent	$4,800	$3,600	$1,200	$2,400	$12,000
Lighting expenses	$450	$220	$110	$220	$1,000
heating	$2,000	$1,000	$400	$600	$4,000
buildings insurance	$5,400	$4,500	N/A	$8,100	$18,000
MOH allocated	$54,650	$53,320	$23,710	$45,320	$177,000
Allocation Warehouses center	$22,660	$11,330	$11,330		
Allocation power center	$21,024	$14,016			
Total (MOH)	$98,334	$78,666			$177,000
Allocation basis	÷ 10,000	÷ 5,000			
Allocation rate	9.8334	15.7332			

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

- Share of the (X) center = 45,320 x 50% = 22,660 EGP.
- Share of the (Y) center = 45,320 x 25% = 11,330 EGP.
- Share of the Power center = 45,320 x 25% = 11,330 EGP.

The centers, share from the cost of power = (23,710 + 11,330) services center:

- Share of the (Manufacturing) center = 35,040 x 60% = 21,024 EGP.
- Share of the (Assembly) center = 35,040 x 40% = 14,016 EGP.

Second: Determining allocation rate to production centers, as following:

- **Allocation rate - Manufacturing center = 98,334 ÷ 10,000**
  = 9.8334 EGP per machine hour.
- **Allocation rate - Assembly center = 78,666 ÷ 5,000**
  = 15.7332 EGP Per direct labor hour.

Chapter (2): Marketing and administrative costs

First: true (√) & false (x) questions:

1	Marketing costs are defined as the economic sacrifices that the company incurs to achieve the objectives of the marketing activity.	√
2	The concept of marketing costs focuses on the elements of costs that the company exhausts to carry out the marketing activity from the viewpoint of the national economy.	x
3	The objectives of marketing cost accounting do not differ from the objectives of indirect industrial cost accounting.	√
4	Providing the necessary data to rationalize the decision-making of the marketing mix is one of the marketing costs objectives.	√
5	The company's production costs are characterized by the relative change in the number and type of cost item.	x
6	Marketing costs are characterized by relative stability in number and type of cost item.	x
7	Marketing costs are analyzed according to the relationship to product unit or production volume.	x
8	Production costs are analyzed according to the goal or purpose of the analysis and tabulation.	√
9	Marketing costs are analyzed and classified according to the centers of responsibility into materials, work, and services.	x
10	According to the liability accounting system, the sales area is intended a profit center that determines the outcome of this area's activities.	√
11	Areas or commodities can be considered in the marketing activity as the productive function.	√
12	The allocation rate for each area is determined based on the number of units sold only.	x
13	From the point of view of the enterprise, marketing costs are a group of what consumers bear in exchange for various services.	x
14	Marketing functions related to creating demand for a good or service are among the most important basic functions of marketing activity.	√
15	Marketing costs are more difficult to study and analyze due to their variability and instability.	√
16	Technological development and the use of computers in production	√

	processes led to a change in the product cost structure.	
17	**The analysis according to the relationship to the volume of sales is one of the most important foundations for analyzing and classifying marketing costs.**	√
18	**Indirect costs do not need a specific basis to allocate them.**	**x**

Second: Choose the correct answer:

Example (1): Shaheen Company for trad in building materials, headquarters in Tanta city. markets its products in three areas, which are Tanta city Center, Sadat City Center, and Damanhur City Center. The following is the marketing and sales activity data for the month of March 2022:

Desc.	Home	Tanta	Sadat	Damanhur
Sales value (EGP)	--	70,000	80,000	50,000
Cost of purchasing units sold (EGP)	--	35,000	45,000	20,000
Sales commission (EGP)	--	2.5%	3%	2%
Salaries of salesmen (EGP)	--	5,075	2,975	7,000
Sales management expenses (EGP)	5,000	1,500	2,700	1,800
Advertising expenses (EGP)	7,000	--	--	--
Insurance expenses (EGP)	3,500	--	--	--
Transportation expenses (EGP)	10,000	2,000	1,600	1,100
Packaging costs (EGP)	8,000	2,000	500	1,200
weighted distance in tons	--	1,700	2,000	1,300
Administrative costs (EGP)	--	4,000	3,000	6,500
Financing costs (EGP)	--	2,000	1,500	3,000

- Data related to the basis for allocation of the indirect marketing costs:

Desc.	Allocation basis
Sales management expenses	Direct sales management expenses to areas
Advertising expenses	Sales value
Insurance expenses	Cost of purchasing units sold

Transportation expenses	weighted distance in tons
Packaging costs	Sales value

After Preparing a statement of allocation the marketing costs According to Areas, determine the allocation rate of sales value from marketing costs and preparing the income statement for each area. Choose the correct answer as following:

1- Allocation rate – Tanta city: ……

A 0.335 EGP per sales EGP. B 0.413 EGP per sales EGP.

C 0.300 EGP per sales EGP. D 0.555 EGP per sales EGP.

2- Allocation rate – Sadat city: ……

A 0.335 EGP per sales EGP. B 0.413 EGP per sales EGP.

C 0.300 EGP per sales EGP. D 0.555 EGP per sales EGP.

3- Allocation rate – Damanhur city: ……

A 0.335 EGP per sales EGP. B 0.413 EGP per sales EGP.

C 0.300 EGP per sales EGP. D 0.555 EGP per sales EGP.

4- Total marketing costs for Tanta city: ……

A 23,450 EGP. B 24,200 EGP.

C 11,000 EGP. D 20,500 EGP.

5- Total marketing costs for Sadat city: ……

A 23,450 EGP. B 24,000 EGP.

C 11,000 EGP. D 20,500 EGP.

6- Total marketing costs for Damanhur city: ……

A 23,450 EGP. B 24,000 EGP.

C 11,000 EGP. D 20,650 EGP.

7- Gross profit (Loss) for Tanta city: ……

A 23,450 EGP. B 24,000 EGP.

C 11,550 EGP. D 20,650 EGP.

8- Gross profit (Loss) for Sadat city: ……

A 23,450 EGP. B 11,000 EGP.

C 11,550 EGP. D (550) EGP.

9- Gross profit (Loss) for Damanhur city: ……

A 9,350 EGP. B 11,000 EGP.

C 11,550 EGP. D (3,350) EGP.

10- Net profit (Loss) for Tanta city: ……

A 5,550 EGP. B 11,000 EGP.

C 11,550 EGP. D (3,350) EGP.

11- Net profit (Loss) for Sadat city: ……

A 5,550 EGP. B 11,000 EGP.

C 6,500 EGP. D (2,450) EGP.

12- Net profit (Loss) for Damanhur city: ……

A 5,550 EGP. B 350 EGP.

C 6,500 EGP. D (150) EGP.

13- Share of the Tanta city from packaging costs: ……

A 5,000 EGP. B 350 EGP.

C 3,300 EGP. D 2,800 EGP.

14- Share of the Sadat city from packaging costs: ……

A 5,000 EGP. B 3,200 EGP.

C 3,300 EGP. D 2,800 EGP.

15- Share of the Damanhur city from packaging costs: ……

A 2,000 EGP. B 3,200 EGP.

C 3,300 EGP. D 2,800 EGP.

16- Total direct marketing costs for Tanta city: ……

A 12,000 EGP. B 13,200 EGP.

C 12,325 EGP. D 11,800 EGP.

17- Total direct marketing costs for Sadat city: ……

A 10,175 EGP. B 13,200 EGP.

C 12,325 EGP. D 11,800 EGP.

18- Total direct marketing costs for Damanhur city: ……

A 10,175 EGP. B 13,200 EGP.

C 12,100 EGP. D 11,800 EGP.

19- Share of the Tanta city from Advertising expenses: ……

A 5,000 EGP. B 2,450 EGP.

C 3,300 EGP. D 2,800 EGP.

20- Share of the Damanhur city from Advertising expenses: ……

A 5,000 EGP. B 2,450 EGP.

C 3,300 EGP. D 1,750 EGP.

Example (2): Celia Company for trade in building materials, headquarters in Tanta city. markets its products in three areas, which are Tanta city Center, Sadat City Center, and Aswan City Center. The following is the marketing and sales activity data for the month of December 2022:

Desc.	Home	Tanta	Sadat	Aswan
Direct marketing costs (EGP)	--	30,000	43,680	51,480
Indirect marketing costs (EGP) allocated based on the sales value	150,000	--	--	--
Unit selling price (EGP)	--	10	12	11
Unit purchase price (EGP)	3	--	--	--
Number of units sold	--	10,000	14,000	12,000
Administrative and financing costs (EGP) allocated based on the sales value	25,000	--	--	--

After Preparing a statement of allocation the marketing costs According to Areas, determine the allocation rate of sales value from marketing costs and preparing the income statement for each area. Choose the correct answer as following:

21- Allocation rate – Tanta city: ……

A 0.55 EGP per sales EGP. B 0.700 EGP per sales EGP.

C 0.300 EGP per sales EGP. D 0.460 EGP per sales EGP.

22- Allocation rate – Sadat city: ……

A 0.55 EGP per sales EGP. B 0.700 EGP per sales EGP.

C 0.300 EGP per sales EGP. D 0.51 EGP per sales EGP.

23- Allocation rate – Aswan city: ……

A 0.55 EGP per sales EGP. B 0.700 EGP per sales EGP.

C 0.64 EGP per sales EGP. D 0.51 EGP per sales EGP.

24- Sales value for Tanta city: ……

A 150,000 EGP. B 160,000 EGP.

C 130,000 EGP. D 100,000 EGP.

25- Sales value for Sadat city: ……

A 150,000 EGP. B 168,000 EGP.

C 130,000 EGP. D 100,000 EGP.

26- Sales value for Aswan city: ……

A 150,000 EGP. B 168,000 EGP.

C 132,000 EGP. D 100,000 EGP.

27- Cost of purchasing units sold for Tanta city: ……

A 50,000 EGP. B 68,000 EGP.

C 32,000 EGP. D 30,000 EGP.

28- Cost of purchasing units sold for Sadat city: ……

A 50,000 EGP. B 68,000 EGP.

C 42,000 EGP. D 30,000 EGP.

29- Cost of purchasing units sold for Aswan city: ……

A 50,000 EGP. B 68,000 EGP.

C 42,000 EGP. D 36,000 EGP.

30- Total marketing costs for Tanta city: ……

A 55,000 EGP. B 68,000 EGP.

C 42,000 EGP. D 36,000 EGP.

31- Total marketing costs for Sadat city: ……

A 55,000 EGP. B 85,680 EGP.

C 42,000 EGP. D 36,000 EGP.

32- Total marketing costs for Aswan city: ……

A 55,000 EGP. B 85,680 EGP.

C 84,480 EGP. D 36,000 EGP.

33- Gross profit (Loss) for Tanta city: ……

A 15,000 EGP. B 40,320 EGP.

C 44,480 EGP. D (7,200) EGP.

34- Gross profit (Loss) for Sadat city: ……

A 15,000 EGP. B 40,320 EGP.

C 44,480 EGP. D (5,150) EGP.

35- Gross profit (Loss) for Aswan city: ……

A 15,000 EGP. B 40,320 EGP.

C 11,520 EGP. D (3,200) EGP.

36- Net profit (Loss) for Tanta city: ……

A 5,000 EGP. B 4,320 EGP.

C 8,750 EGP. D (200) EGP.

37- Net profit (Loss) for Sadat city: ……

A 29,820 EGP. B 4,320 EGP.

C 8,750 EGP. D (7,330) EGP.

38- Net profit (Loss) for Aswan city: ……

A 29,820 EGP. B 3,270 EGP.

C 8,750 EGP. D (330) EGP.

Chapter (3): Standard costs framework

First: true (√) & false (x) questions:

1	The actual costs refer to the costs that can be measured before the completion of production	x
2	Standard cost represents the standard that the actual cost should be upon implementation	√
3	The main objective of standard costs is to control costs	√
4	Standard costs are more general and comprehensive than planning budgets	√
5	The standard cost per unit is determined after starting the production process	x
6	Actual costs are the result of the deficiency of standard costs	x
7	The standard price of the quantity of raw materials means the purchase price plus all the expenses of these materials until it reaches the company's warehouse	√
8	The objective of cost estimation is to control and judge the efficient use of costs	x
9	Target cost is defined as the lowest permissible expected cost of the product	x
10	One of the characteristics of target costs is that they are applied in the production phase	x
11	Determining the target price is the first step in determining and calculating the target cost	x
12	In practical life, there is one method for determining and calculating the target cost, which is the "addition method"	x
13	Here are the following cost data (direct materials: 5 kilograms - at a price of 2 pounds per kilo, direct wages: 8 hours - at a rate of 5 pounds per hour, indirect manufacturing costs: 8 hours - at a rate of 3 pounds per hour). In light of this, the standard cost per unit of the product is 75 pounds.	x
14	According to the discount method, the target cost is calculated by determining the target cost for each part, taking into account any possible cost reductions	x
15	One of the disadvantages of the deduction method for calculating the target cost is the difficulty of linking this method systematically with production plans	x

16	The application of the standard costing system achieves one goal, which is to develop cost awareness	x
17	The costs identified in advance are used as a basis for judging the efficiency of actual performance.	√
18	Cost control aims to reduce costs and not to rationalize costs	x
19	The actual costs refer to the costs that can be measured before the completion of production.	x
20	The main objective of standard costs is to control costs.	√
21	The standard cost per unit is determined after starting the production process.	x
22	The standard price of the quantity of raw materials means the purchase price plus all the expenses of these materials until it reaches the company's warehouse	√
23	The binary analysis of the total variance of direct materials is made into the two cost components, namely quantity and wage rate	x
24	The application of the standard costing system achieves one goal, which is to develop cost awareness	x
25	Positive variance is not in the interest of the company and the reasons for its occurrence must be searched	x
26	According to the binary analysis, the total variance arises from the variance of the standard quantity from the actual quantity only	x
27	The result of the direct materials total variance must be equal to the sum of the results of the binary analysis of the total variance	√
28	The result of the direct wages total variance must be equal to the sum of the results of the binary analysis of the total variance	√
29	The result of the direct materials total variance must be equal to the sum of the results of the triple analysis of the total variance	√
30	The total variance of direct wages is analyzed according to the binary analysis into the efficiency variance and the net wage rate variance	x
31	The total variance of direct materials is analyzed according to the binary analysis into the quantity variance and the price variance	√
32	The total variance of direct wages is analyzed according to the triple analysis into the efficiency variance, the net wage rate variance, and the mixed price variance.	x

Chapter (4): Analysis of differences (variances) of direct cost

Example (1): The following data were extracted from an industrial company:

	Standard Data		Actual Data	
Direct Materials	Quantity	Price	Quantity	Price
	4 kg.	3 EGP.	5 kg.	2 EGP.
	Actual Volume of production 3,000 unit			

After Determine and analyze the variances between the standard cost and the actual cost of Direct materials.

1- The standard cost of direct materials is: ……

A 40,000 EGP. B 36,000 EGP.

C 35,000 EGP. D 33,000 EGP.

2- The actual cost of direct materials is: ……

A 40,000 EGP. B 36,000 EGP.

C 30,000 EGP. D 33,000 EGP.

3- The total variance of direct materials is: ……

A + 6,000 EGP. B - 9,000 EGP.

C + 3,000 EGP. D - 3,000 EGP.

4- The quantity variance of direct materials is: ……

A + 6,000 EGP. B - 9,000 EGP.

C + 3,000 EGP. D - 3,000 EGP.

5- The price variance of direct materials is: ……

A + 6,000 EGP. B - 9,000 EGP.

C + 3,000 EGP. D + 15,000 EGP.

6- The net price variance of direct materials is: ……

A + 12,000 EGP. B - 9,000 EGP.

C + 3,000 EGP. D + 15,000 EGP.

7- The mixed price variance of direct materials is: ……

A + 12,000 EGP. B - 9,000 EGP.

C + 3,000 EGP. D + 15,000 EGP.

8- Net price variance + Mixed price variance = ……

A + 12,000 EGP. B - 9,000 EGP.

C + 3,000 EGP. D + 15,000 EGP.

Example (2): The following data were extracted from an industrial company:

	Standard Data		Actual Data	
Direct Materials	Quantity	Price	Quantity	Price
	6.5 kg.	5 EGP.	7 kg.	4 EGP.
	Actual Volume of production 5,000 unit			

After Determine and analyze the variances between the standard cost and the actual cost of Direct materials.

9- The standard cost of direct materials is: ……

A 162,000 EGP. B 170,000 EGP.

C 162,500 EGP. D 145,000 EGP.

10- The actual cost of direct materials is: ……

A 140,000 EGP. B 170,000 EGP.

C 162,500 EGP. D 145,000 EGP.

11- The total variance of direct materials is: ……

A + 26,000 EGP. B - 22,000 EGP.

C + 22,500 EGP. D - 12,500 EGP.

12- The quantity variance of direct materials is: ……

A + 26,000 EGP. B - 22,000 EGP.

C + 22,500 EGP. D - 12,500 EGP.

13- The price variance of direct materials is: ……

A + 6,000 EGP. B - 2,500 EGP.

C + 32,500 EGP. D + 35,000 EGP.

14- The net price variance of direct materials is: ……

A + 22,200 EGP. B - 2,500 EGP.

C + 32,500 EGP. D + 35,000 EGP.

15- The mixed price variance of direct materials is: ……

A + 22,200 EGP. B + 2,500 EGP.

C + 32,500 EGP. D + 35,000 EGP.

16- Quantity variance + Net price variance + Mixed price variance = ……

A + 22,500 EGP. B + 2,500 EGP.

C + 32,500 EGP. D + 35,000 EGP.

Example (3): The following data were extracted from an industrial company:

	Standard Data		Actual Data
Direct Materials	Quantity	Price	The actual quantity issued is 20,000 kg.
	3 kg.	20 EGP.	The actual price is 17 EGP per Kg.
	▪ Actual Volume of production 6,000 unit. ▪ Standard Volume of production 6,200 unit.		

After Determine and analyze the variances between the standard cost and the actual cost of Direct materials.

17- The standard cost of direct materials is: ……

A 340,000 EGP. B 370,000 EGP.

C 360,000 EGP. D 380,000 EGP.

18- The actual cost of direct materials is: ……

A 340,000 EGP. B 370,000 EGP.

C 360,000 EGP. D 380,000 EGP.

19- The total variance of direct materials is: ……

A + 20,000 EGP. B - 22,000 EGP.

C + 22,500 EGP. D - 12,500 EGP.

20- The quantity variance of direct materials is: ……

A + 45,000 EGP. B - 70,000 EGP.

C + 38,500 EGP. D - 40,000 EGP.

21- The price variance of direct materials is: ……

A + 60,000 EGP. B - 40,500 EGP.

C + 20,000 EGP. D + 54,000 EGP.

22- The net price variance of direct materials is: ……

A + 60,000 EGP. B - 40,500 EGP.

C + 20,000 EGP. D + 54,000 EGP.

23- The mixed price variance of direct materials is: ……

A + 20,000 EGP. B - 2,500 EGP.

C + 6,000 EGP. D + 15,000 EGP.

24- Quantity variance + Price variance = ……

A + 22,500 EGP. B + 2,500 EGP.

C + 32,500 EGP. D + 20,000 EGP.

Example (4): The production center (A) produces a product (B) that uses four types of direct materials. The following are their data:

DSC	Standard Data		Actual Data	
	Quantity	Price	Quantity	Price
X 1	4	8	4.2	10
X 2	3	7	2.4	6
X 3	2	2	3.6	1.5
X 4	1	1	1.8	1
Production volume	650 unit		500 unit	

After Determine and analyze the variances between the standard cost and the actual cost of Direct materials.

25- The standard cost of direct material (X1) is: ……

A 10,500 EGP. B 2,000 EGP.

C 16,000 EGP. D 29,000 EGP.

26- The standard cost of direct material (X2) is: ……

A 10,500 EGP. B 2,000 EGP.

C 16,000 EGP. D 29,000 EGP.

27- The standard cost of direct material (X3) is: ……

A 10,500 EGP. B 2,000 EGP.

C 16,000 EGP. D 29,000 EGP.

28- The standard cost of direct material (X4) is: ……

A 500 EGP. B 2,000 EGP.

C 16,000 EGP. D 29,000 EGP.

29- The standard cost of product (B) is: ……

A 500 EGP. B 2,000 EGP.

C 16,000 EGP. D 29,000 EGP.

30- The actual cost of direct material (X1) is: ……

A 10,500 EGP. B 2,000 EGP.

C 21,000 EGP. D 29,000 EGP.

31- The actual cost of direct material (X2) is: ……

A 10,500 EGP. B 7,200 EGP.

C 21,000 EGP. D 29,000 EGP.

32- The actual cost of direct material (X3) is: ……

A 10,500 EGP. B 7,200 EGP.

C 21,000 EGP. D 2,700 EGP.

33- The actual cost of direct material (X4) is: ……

A 1,500 EGP. B 7,200 EGP.

C 900 EGP. D 2,700 EGP.

34- The actual cost of product (B) is: ……

A 31,800 EGP. B 33,000 EGP.

C 45,000 EGP. D 29,000 EGP.

35- The total variance of direct material (X 1) is: ……

A - 5000 EGP. B + 3,300 EGP.

C - 7,000 EGP. D + 2,100 EGP.

36- The total variance of direct material (X 2) is: ……

A - 5000 EGP. B + 3,300 EGP.

C - 7,000 EGP. D + 2,100 EGP.

37- The total variance of direct material (X 3) is: ……

A - 5000 EGP. B + 3,300 EGP.

C - 700 EGP. D + 2,100 EGP.

38- The total variance of direct material (X 4) is: ……

A - 5000 EGP. B + 3,300 EGP.

C - 400 EGP. D + 2,100 EGP.

39- The total variance of product (B) is: ……

A - 5000 EGP. B + 3,300 EGP.

C - 400 EGP. D - 2,800 EGP.

40- The quantity variance of direct material (X 1) is: ……

A - 5000 EGP. B + 3,300 EGP.

C - 400 EGP. D - 800 EGP.

41- The quantity variance of direct material (X 2) is: ……

A - 5000 EGP. B + 2,100 EGP.

C - 400 EGP. D - 800 EGP.

42- The quantity variance of direct material (X 3) is: ……

A - 1,600 EGP. B + 2,100 EGP.

C - 400 EGP. D - 800 EGP.

43- The quantity variance of direct material (X 4) is: ……

A - 1,600 EGP. B + 2,100 EGP.

C - 400 EGP. D - 800 EGP.

44- The quantity variance of product (B) is: ……

A - 1,600 EGP. B + 2,100 EGP.

C - 400 EGP. D - 700 EGP.

45- The price variance of direct material (X 1) is: ……

A - 1,600 EGP. B + 2,100 EGP.

C - 400 EGP. D - 4,200 EGP.

46- The price variance of direct material (X 2) is: ……

A + 1,200 EGP. B + 2,100 EGP.

C - 400 EGP. D - 4,200 EGP.

47- The price variance of direct material (X 3) is: ……

A + 1,200 EGP. B + 900 EGP.

C - 400 EGP. D Zero.

48- The price variance of direct material (X 4) is: ……

A + 1,200 EGP. B + 900 EGP.

C - 400 EGP. D Zero.

49- The price variance of product (B) is: ……

A + 1,200 EGP. B + 900 EGP.

C - 2,100 EGP. D Zero.

50- The net price variance of direct material (X 1) is: ……

A + 1,200 EGP. B + 900 EGP.

C - 2,100 EGP. D - 4,000 EGP.

51- The net price variance of direct material (X 2) is: ……

A + 1,200 EGP. B + 1,500 EGP.

C - 2,100 EGP. D - 4,000 EGP.

52- The net price variance of direct material (X 3) is: ……

A + 1,200 EGP. B + 500 EGP.

C - 2,100 EGP. D Zero.

53- The net price variance of direct material (X 4) is: ……

A + 1,200 EGP. B + 500 EGP.

C - 2,100 EGP. D Zero.

54- The net price variance of product (B) is: ……

A + 1,200 EGP. B + 900 EGP.

C - 2,000 EGP. D Zero.

55- The mixed price variance of direct material (X 1) is: ……

A + 1,200 EGP. B + 900 EGP.

C - 200 EGP. D - 4,000 EGP.

56- The mixed price variance of direct material (X 2) is: ……

A + 1,200 EGP. B + 1,500 EGP.

C - 2,100 EGP. D - 300 EGP.

57- The mixed price variance of direct material (X 3) is: ……

A + 1,200 EGP. B + 400 EGP.

C - 2,100 EGP. D Zero.

58- The mixed price variance of direct material (X 4) is: ……

A + 1,200 EGP. B + 500 EGP.

C - 2,100 EGP. D Zero.

59- The mixed price variance of product (B) is: ……

A + 1,200 EGP. B + 900 EGP.

C - 2,000 EGP. D - 100 EGP.

Example (5): The following is data on the costs of standard and actual materials to produce product (A) in an industrial company for the month of November 2022:

Raw materials	Standard Quantity per unit	Standard Price per kg	Actual Quantity issued	Actual Price per kg
X	9 kg.	80 EGP.	4,500 kg.	85 EGP.
Y	7 kg.	60 EGP.	2,500 kg.	70 EGP.

- Actual Volume of production from product (A) 500 unit
- Standard Volume of production from product (A) 800 unit

After Determine and analyze the variances between the standard cost and the actual cost of Direct materials.

60- The standard cost of direct material (X) is: ……

A 400,500 EGP. B 380,000 EGP.

C 360,000 EGP. D 410,000 EGP.

61- The standard cost of direct material (Y) is: ……

A 382,500 EGP. B 210,000 EGP.

C 557,000 EGP. D 175,000 EGP.

62- The standard cost of product (A) is: ……

A 382,500 EGP. B 210,000 EGP.

C 570,000 EGP. D 175,000 EGP.

63- The actual cost of direct material (X) is: ……

A 382,500 EGP. B 210,000 EGP.

C 570,000 EGP. D 175,000 EGP.

64- The actual cost of direct material (Y) is: ……

A 382,500 EGP. B 210,000 EGP.

C 570,000 EGP. D 175,000 EGP.

65- The actual cost of product (A) is: ……

A 382,500 EGP. B 210,000 EGP.

C 557,500 EGP. D 175,000 EGP.

66- The total variance of direct material (X) is: ……

A - 25,000 EGP. B + 40,300 EGP.

C - 22,500 EGP. D + 22,100 EGP.

67- The total variance of direct material (Y) is: ……

A - 25,000 EGP. B + 35,000 EGP.

C - 22,500 EGP. D + 22,100 EGP.

68- The total variance of product (A) is: ……

A - 25,000 EGP. B + 35,000 EGP.

C - 22,500 EGP. D + 12,500 EGP.

69- The Quantity variance of direct material (X) is: ……

A - 25,000 EGP. B + 35,000 EGP.

C - 22,500 EGP. D Zero.

70- The Quantity variance of direct material (Y) is: ……

A - 25,000 EGP. B + 60,000 EGP.

C - 60,500 EGP. D Zero.

71- The Quantity variance of product (A) is: ……

A - 25,000 EGP. B + 60,000 EGP.

C - 60,500 EGP. D Zero.

72- The Price variance of direct material (X) is: ……

A - 25,000 EGP. B + 60,000 EGP.

C - 60,500 EGP. D - 22,500 EGP.

73- The Price variance of direct material (Y) is: ……

A - 25,000 EGP. B + 60,000 EGP.

C - 60,500 EGP. D - 22,500 EGP.

74- The Price variance of product (A) is: ……

A - 25,000 EGP. B + 60,000 EGP.

C - 47,500 EGP. D - 22,500 EGP.

75- The Net Price variance of direct material (X) is: ……

A - 25,000 EGP. B + 60,000 EGP.

C - 60,500 EGP. D - 22,500 EGP.

76- The Net Price variance of direct material (Y) is: ……

A - 35,000 EGP. B + 60,000 EGP.

C - 60,500 EGP. D - 22,500 EGP.

77- The Net Price variance of product (A) is: ……

A - 25,000 EGP. B + 60,000 EGP.

C - 57,500 EGP. D - 22,500 EGP.

78- The Mixed Price variance of direct material (X) is: ……

A - 25,000 EGP. B + 60,000 EGP.

C - 60,500 EGP. D Zero.

79- The Mixed Price variance of direct material (Y) is: ……

A + 10,000 EGP. B + 60,000 EGP.

C - 60,500 EGP. D Zero.

80- The Mixed Price variance of product (A) is: ……

A + 10,000 EGP. B + 60,000 EGP.

C - 60,500 EGP. D Zero.

Example (6): The following data were extracted from an industrial company:

	Standard Data		Actual Data	
Direct Wages	hours	Wage Rate	hours	Wage rate
	6 hours.	3 EGP.	5 hours.	4 EGP.
	Actual Volume of production 3,000 unit			

After Determine and analyze the variances between the standard cost and the actual cost of Direct wages.

81- The standard cost of direct wages is: ……

A 45,000 EGP. B 54,000 EGP.

C 62,000 EGP. D 70,000 EGP.

82- The actual cost of direct wages is: ……

A 45,000 EGP. B 54,000 EGP.

C 60,000 EGP. D 70,000 EGP.

83- The total variance of direct wages is: ……

A - 6,000 EGP. B - 9,000 EGP.

C + 3,000 EGP. D - 3,000 EGP.

84- The Efficiency variance of direct wages is: ……

A - 6,000 EGP. B - 9,000 EGP.

C + 9,000 EGP. D - 3,000 EGP.

85- The Wage rate variance of direct wages is: ……

A - 6,000 EGP. B - 15,000 EGP.

C + 9,000 EGP. D - 3,000 EGP.

86- The net rate wage variance of direct wages is: ……

A - 6,000 EGP. B - 18,000 EGP.

C + 9,000 EGP. D - 3,000 EGP.

87- The mixed rate wage variance of direct wages is: ……

A - 6,000 EGP. B - 18,000 EGP.

C + 9,000 EGP. D + 3,000 EGP.

88- Net rate wage variance + Mixed rate wage variance ……

A - 6,000 EGP. B - 15,000 EGP.

C + 9,000 EGP. D - 3,000 EGP.

Example (7): The following data were extracted from an industrial company:

	Standard Data		Actual Data
Direct wages	hours	Wage rate	The actual cost of direct wages is 60,000 EGP.
	3 hours.	5 EGP.	The actual rate is 6 EGP per hour.
	▪ Standard Volume of production 4,000 unit ▪ Actual Volume of production 5,000 unit		

After Determine and analyze the variances between the standard cost and the actual cost of Direct wages.

89- The standard cost of direct wages is: ……

A 45,000 EGP. B 54,000 EGP.

C 62,000 EGP. D 75,000 EGP.

90- The actual cost of direct wages is: ……

A 45,000 EGP. B 54,000 EGP.

C 60,000 EGP. D 70,000 EGP.

91- The total variance of direct wages is: ……

A - 6,000 EGP. B - 9,000 EGP.

C + 3,000 EGP. D + 15,000 EGP.

92- The Efficiency variance of direct wages is: ……

A + 25,000 EGP. B - 9,000 EGP.

C + 9,000 EGP. D - 3,000 EGP.

93- The Wage rate variance of direct wages is: ……

A - 6,000 EGP. B - 15,000 EGP.

C + 9,000 EGP. D - 10,000 EGP.

94- The net rate wage variance of direct wages is: ……

A - 15,000 EGP. B - 18,000 EGP.

C + 9,000 EGP. D - 3,000 EGP.

95- The mixed rate wage variance of direct wages is: ……

A - 6,000 EGP. B - 18,000 EGP.

C + 9,000 EGP. D + 5,000 EGP.

Example (1): For each of the following independent cases, fill in the missing amounts in the table:

Case	Direct Labor Rate Variance	Direct Labor Efficiency Variance	Direct Labor Total Variance
A	$ 750 UF	$ 1,200 F	??
B	$ 2,000 F	??	$ 3,500 UF
C	$ 1,000 F	??	$ 1,800 F
D	??	$ 500 U	$ 2,500 UF
E	??	$1,100 F	$ 1,950 UF
F	$ 650 UF	$ 1,150 UF	??

Solution

Case	Direct Labor Rate Variance	Direct Labor Efficiency Variance	Direct Labor Total Variance
A	$ 750 UF	$ 1,200 F	$ 450 F
B	$ 2,000 F	$ 5,500 UF	$ 3,500 UF
C	$ 1,000 F	$ 800 F	$ 1,800 F
D	$ 2,000 UF	$ 500 UF	$ 2,500 UF
E	$ 3,050 UF	$1,100 F	$ 1,950 UF
F	$ 650 UF	$ 1,150 UF	$ 1,800 UF

Example (2): Calculating Unknown Values for Direct Materials and Direct Labor Variance:

	Direct Materials	Direct Labor
Standard Quantity per unit produced	2.5 kg.	1.10 hr.
Standard price	$4.20 per kg.	$16 per hr.
Actual Quantity per unit produced	2.4 kg.	1.20 hr.
Actual price	$4.10 per kg.	$15.5 per hr
Actual number of units produced and sold	2,500 units.	
Direct material Price variance	???	
Direct material Quantity variance	???	
Direct material total variance	???	
Direct labor rate variance		???
Direct labor efficiency variance		???
Direct labor total variance		???

Frist: direct material:

AP = 4.10 per kg.
AQ = 2.4 × 2,500 = 6,000 kg.
SP = 4.20 per kg.
SQ = 2.5 × 2,500 = 6,250 kg.

DM - Price Variance = (SP – AP) × AQ
= (4.20 – 4.10) × 6,000
= 0.10 × 6,000
= $ 600 F

DM - Quantity Variance = (SQ – AQ) × SP
= (6,250 – 6,000) × 4.20
= 250 × 4.20
= 1,050 F

DM - Total Variance = Price Variance + Quantity Variance
= 600 F + 1,050 F
= 1,650 F

Second: Direct Labor:

AR = $15.50 per hour.
AH = 1.20 × 2,500 = 3,000 hours.
SR = $16.00 per hour.
SH = 1.10 × 2,500 = 2,750 hours.

DL - Rate Variance = (SR – AR) × AH
= (16 – 15.50) × 3,000
= 0.50 × 3,000
= $ 1,500 F

DL - Efficiency Variance = (SH – AH) × SR
= (2,750 – 3000) × 16
= - 250 × 16
= $ 4,000 U.

DL - total Variance = Rate Variance + Efficiency Variance
= 1,500 F + 4,000 U
= $ 2,500 U.

	Direct Materials	Direct Labor
Standard Quantity per unit produced	2.5 kg.	1.10 hr.
Standard price	$4.20 per kg.	$16 per hr.
Actual Quantity per unit produced	2.4 kg.	1.20 hr.
Actual price	$4.10 per kg.	$15.5 per hr
Actual number of units produced and sold	2,500 units.	
Direct material Price variance	$ 600 F	
Direct material Quantity variance	1,050 F	
Direct material total variance	1,650 F	
Direct labor rate variance		$ 1,500 F
Direct labor efficiency variance		$ 4,000 U
Direct labor total variance		$ 2,500 U

Example (3): O'Shea company uses standard costing system when developing its flexible budget amounts. In April 2024, 2,000 finished units were produced. The following information relates to its direct manufacturing material cost:

- Direct materials used were 4,400 kilograms (kg).
- The standard direct materials input allowed for on output units is 2 kilograms at $15 per kilogram.
- O'Shea purchased 5,000 kilograms of materials at $16.50 per kilogram, a total of $82,500.

Required:

1- Calculate Direct material price variance.
2- Calculate Direct material Quantity variance.
3- Calculate Direct material Net price variance.
4- Calculate Direct material mixed price variance.

Solution

AP = $16.50 per kg.
AQ used = 4,400 kg.
AQ purchased = 5,000 kg.
SP = $15 per kg.
SQ = 2 kg × 2,000 unit = 4,000 kg.

1- DM - Price Variance = (SP – AP) × AQ purchased
= (15 – 16.5) × 5,000
= 1.50 × 5,000
= $ 7,500 U

2- DM - Quantity Variance = (SQ – AQ used) × SP
= (4,000 – 4,400) × 15
= 400 × 15
= 6,000 U.

3- Net Price Variance = (SP – AP) × SQ
= (15 – 16.5) × 4,000
= 1.50 × 4,000
= $ 6,000 U

4- Mixed Price Variance = (SQ - AQ purchased) × (AP - SP)
= (4,000 – 5,000) × (16.5 – 15)
= 1,000 × 1.5
= 1,500 U