

25. What steps must a company take to successfully employ activity-based costing?
26. What is the relationship between activity-based costing and activity-based management?
27. Distinguish between volume-related and non-volume-related overhead costs.
28. If the factory overhead control account has a debit balance of \$1,000 at the end of the first month of the fiscal year, has the overhead been under- or overapplied for the month? What are some probable causes for the debit balance?
29. If the factory overhead control account has a credit balance of \$2,000 at the end of the first month of the fiscal year, has the overhead been under- or overapplied for the month? What are some probable causes for the credit balance?
30. What are two ways that an under- or overapplied factory overhead balance can be disposed of at the end of a fiscal period? How can one decide which method to choose?

EXERCISES

E4-1 Classifying fixed and variable costs

Classify each of the following items of factory overhead as either a fixed or a variable cost. (Include any costs that you consider to be semivariable within the variable category. Remember that variable costs change in total as the volume of production changes.)

L01

- a. Indirect labor
- b. Indirect materials
- c. Insurance on building
- d. Overtime premium pay
- e. Depreciation on building (straight-line method)
- f. Polishing compounds
- g. Depreciation on machinery (units-of-production method)
- h. Employer's payroll taxes
- i. Property taxes
- j. Machine lubricants
- k. Employees' hospital insurance (paid by employer)
- l. Labor for machine repairs
- m. Vacation pay
- n. Janitor's wages
- o. Rent
- p. Small tools
- q. Plant manager's salary
- r. Factory electricity
- s. Product inspector's wages

E4-2 High-low method

Tucson Tractor Inc. has accumulated the following data over a six-month period:

L02

	Indirect Labor Hours	Indirect Labor Costs
January.....	400	\$ 6,000
February.....	500	7,000
March.....	600	8,000
April.....	700	9,000
May.....	800	10,000
June.....	<u>900</u>	<u>11,000</u>
	<u>3,900</u>	<u>\$51,000</u>

Separate the indirect labor into its fixed and variable components, using the high-low method.

E4-3 Scattergraph method

L02

Using the data in E4-2 and a piece of graph paper:

1. Plot the data points on the graph and draw a line by visual inspection, indicating the trend shown by the data points.
2. Determine the variable cost per unit and the total fixed cost from the information on the graph.

E4-4 Least-squares regression method

L02

Using the data in E4-2 and spreadsheet software, determine:

1. The variable cost per unit, the total fixed cost, and R^2 .
2. The plotted data points using the graphing function.
3. Compare the results to your solutions in E4-2 and E4-3.

E4-5 High-low method

L02

Phoenix Plastic Inc. has accumulated the following data over a six-month period:

	Machine Hours	Machine-Related Costs
January.....	700	\$10,000
February.....	900	12,000
March.....	1,100	15,000
April.....	1,300	17,000
May.....	1,500	20,000
June.....	<u>1,700</u>	<u>22,000</u>
	<u>7,200</u>	<u>\$96,000</u>

Separate the machine-related costs into their fixed and variable components, using the high-low method.

E4-6 Computing unit costs at different levels of production

L03

Scentsation Inc. budgeted for 12,000 bottles of perfume Oui during May. The unit cost of Oui was \$20, consisting of direct materials, \$7; direct labor, \$8; and factory overhead, \$5 (fixed, \$2; variable, \$3).

- a. What would be the unit cost if 10,000 bottles were manufactured? (*Hint:* You must first determine the total fixed costs.)
- b. What would be the unit cost if 20,000 bottles were manufactured?
- c. Explain why a difference occurs in the unit costs.

E4-7

E4-8

E4-9

E4-7 Identifying basis for distribution of service department costs

What would be the appropriate basis for distributing the costs of each of the following service departments to the user departments?

L05

- a. Building maintenance
- b. Inspection and packing
- c. Machine repair
- d. Human resources
- e. Purchasing
- f. Shipping
- g. Raw materials storeroom

E4-8 Direct method and sequential method of distributing service department costs

A manufacturing company has two service and two production departments. Building Maintenance and Factory Office are the service departments. The production departments are Assembly and Machining.

L05

The following data have been estimated for next year's operations:

Direct labor hours:	Assembly, 80,000; Machining, 40,000
Floor space occupied:	Factory Office, 10%; Assembly, 40%; Machining, 50%

The direct charges identified with each of the departments are as follows:

Building maintenance	\$ 90,000
Factory office	171,000
Assembly	378,000
Machining	328,000

The building maintenance department services all departments of the company, and its costs are allocated using floor space occupied, while factory office costs are allocable to Assembly and Machining on the basis of direct labor hours.

1. Distribute the service department costs, using the direct method.
2. Distribute the service department costs, using the sequential distribution method, with the department servicing the greatest number of other departments distributed first.

E4-9 Direct method and sequential method of distributing service department costs

A manufacturing company has two service and two production departments. Building Maintenance and Factory Office are the service departments. The production departments are Grinding and Polishing.

05

The following data have been estimated for next year's operations:

Direct labor hours:	Grinding, 75,000; Polishing, 25,000
Floor space occupied:	Factory Office, 10%; Grinding, 60%; Polishing, 30%

P4-4 Least-squares regression method

Using the data in P4-2 and Microsoft Excel:

1. Separate the variable and fixed elements.
2. Determine the cost to be charged to the product for the year.
3. Determine the cost to be charged to factory overhead for the year.
4. Determine the plotted data points using Chart Wizard.
5. How do these solutions compare to the solutions in P4-2 and P4-3?

L02**P4-5 Budgeted factory overhead costs**

Listed below are the budgeted factory overhead costs for 2011 for Valpo Manufacturing Inc. at a projected level of 2,000 units:

L03**Expenses:**

Indirect materials.....	\$ 10,000
Indirect labor	20,000
Power.....	15,000
Straight-line depreciation	30,000
Factory property tax.....	28,000
Factory insurance	22,000
Total.....	<u>\$125,000</u>

**Required:**

Prepare flexible budgets for factory overhead at the 1,000, 2,000, and 4,000 unit levels. (*Hint:* You must first decide which of the listed costs should be considered variable and which should be fixed.)

P4-6 Distribution of service department costs to production departments using the direct method similar to Self-Study Problem 1

Yumee Products Inc. is divided into five departments, Mixing, Blending, Finishing, Factory Office, and Building Maintenance. The first three departments are engaged in production work. Factory Office and Building Maintenance are service departments. During the month of June, the following factory overhead was incurred for the departments:

L05

Mixing	\$21,000	Factory Office.....	9,000
Blending.....	18,000	Building Maintenance....	6,400
Finishing.....	25,000		



The bases for distributing service department expenses to the other departments follow:

Building Maintenance—On the basis of floor space occupied by the other departments as follows: Mixing, 10,000 sq ft; Blending, 4,500 sq ft; Finishing, 10,500 sq ft; and Factory Office, 7,000 sq ft.

Factory Office—On the basis of number of employees as follows: Mixing, 30; Blending, 20; and Finishing, 50.

Required:
Prepare a schedule showing the distribution of the service departments' expenses using the direct distribution method.

Distribution of service department costs to production departments using the sequential distribution method similar to Self-Study Problem 1

Required:
Using the information in P4-6 above, prepare a schedule showing the distribution of the service departments' expenses using the sequential distribution method in the order of number of other departments served. (*Hint:* First distribute the service department that serves the greater number of other departments.)

Journalizing the distribution of service department costs to production departments

Required:
Using your solution to P4-7 above, prepare journal entries for the following:

- (1) The distribution of the total factory overhead of \$79,400 to the individual production and service departments where it originated.
- (2) The distribution of the Building Maintenance overhead to the appropriate other departments.
- (3) The distribution of the Factory Office overhead to the appropriate other departments.

Determining total job costs, using predetermined overhead rate
Melanie-Rae Manufacturing Co. uses the job order cost system of accounting. The following is a list of the jobs completed during March, showing the charges for materials requisitioned and for direct labor.

Job	Materials Requisitioned	Direct Labor
18AX.....	\$ 300.00	\$ 600.00
19BT.....	1,080.00	940.00
20CD.....	720.00	1,400.00
21FB.....	4,200.00	5,120.00

Assume that factory overhead is applied on the basis of direct labor costs and that the predetermined rate is 200%.

Required:

1. Compute the amount of overhead to be added to the cost of each job completed during the month.
2. Compute the total cost of each job completed during the month.
3. Compute the total cost of producing all the jobs finished during the month.



L06

P4-9

L05

P4-8

L05

P4-7

P4-1

P4-1