Chapter 26(11)
Cost Allocation and Activity-Based Costing

OBJECTIVES

Obj 1	Identify three methods used for allocating factory overhead costs to products.
Obj 2	Use a single plantwide factory overhead rate for product costing.
Obj 3	Use multiple production department factory overhead rates for product costing.
Obj 4	Use activity-based costing for product costing.
Obj 5	Use activity-based costing to allocate selling and administrative expenses to products.
Obj 6	Use activity-based costing in a service business.

TRUE/FALSE

1. Product costing consists of only direct materials and direct labor.
ANS: F DIF: Easy OBJ: 26(11)-01
NAT: AACSB Analytic | IMA-Cost Management

2. The selection of the factory overhead allocation method is important because the method selected determines the accuracy of the product cost.
ANS: T DIF: Moderate OBJ: 26(11)-01
NAT: AACSB Analytic | IMA-Cost Management

3. Managers depend on accurate factory overhead allocation to make decisions regarding product mix and product price.
ANS: T DIF: Easy OBJ: 26(11)-01
NAT: AACSB Analytic | IMA-Cost Management

4. Managers depend on product costing to make decisions regarding continuing operations, advertising, and product mix.
ANS: T DIF: Easy OBJ: 26(11)-01
NAT: AACSB Analytic | IMA-Cost Management

5. A plant-wide factory overhead rate is computed by dividing total budgeted factory overhead costs by the plant-wide allocation base.
ANS: T DIF: Easy OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

6. Zorn Co. budgeted $600,000 of factory overhead cost for the coming year. Its plant-wide allocation base, machine hours, is budgeted at 100,000 hours. Budgeted units to be produced are 200,000 units. Zorn's plant-wide factory overhead rate is $6.00 per unit.
ANS: F DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

7. Zorn Co. budgeted $300,000 of factory overhead cost for the coming year. Its plant-wide allocation base, machine hours, is budgeted at 50,000 hours. Budgeted units to be produced are 100,000 units. Zorn's plant-wide factory overhead rate is $6.00 per machine hour.
ANS: T DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

8. When a plant-wide factory overhead rate is used, the total overhead costs allocated to all products is the same.
ANS: F DIF: Easy OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

9. When a plant-wide factory overhead rate is used, overhead costs are applied to all products by a single rate.
ANS: T DIF: Easy OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

10. Use of a plant-wide factory overhead rate assumes that the activities causing overhead costs are the same across all departments and products.
ANS: T DIF: Easy OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

11. Use of a plant-wide factory overhead rate assumes that the activities causing overhead costs are different across different departments and products.
ANS: F DIF: Easy OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

12. If the activities causing overhead costs are different across different departments and products, use of a plant-wide factory overhead rate will cause distorted product costs.
ANS: T DIF: Easy OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

13. If the budgeted factory overhead cost is $460,000, the budgeted direct labor hours is 80,000, and the actual direct labor hours is 6,700 for the month, the amount of factory overhead to be allocated is $38,525 (if the allocation is based on direct labor hours).
ANS: T DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

14. If the budgeted factory overhead cost is $460,000, the budgeted direct labor hours is 80,000, and the actual direct labor hours is 6,700 for the month, the factory overhead rate for the month is $68.65 (if the allocation is based on direct labor hours).
ANS: F DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

15. The single plantwide overhead rate method is very expensive to apply.
ANS: F DIF: Easy OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

16. Multiple production department factory overhead rates are most useful when production departments differ in their manufacturing processes.
ANS: T DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

17. Multiple production department factory overhead rates are most useful when production departments are very similar in their manufacturing processes.
ANS: F DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

18. Multiple production department factory overhead rates are more accurate and more costly than are plant-wide factory overhead rates.
ANS: T DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

19. Multiple production department factory overhead rates are less accurate and less costly than are plant-wide factory overhead rates.
ANS: F DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

20. A plant-wide factory overhead rate assumes that all overhead is directly related to one activity representing the entire plant.
ANS: T DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

21. Use of a plant-wide factory overhead rate distorts product costs only when there are differences in the factory overhead rates across different production departments.
ANS: F DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

22. Use of a plant-wide factory overhead rate distorts product costs only when products require different ratios of allocation-base usage in each production department.
ANS: F DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

23. Use of a plant-wide factory overhead rate distorts product costs when there are differences in the factory overhead rates across different production departments and when products require different ratios of allocation-base usage in each production department.
ANS: T DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

24. When production departments differ significantly in their manufacturing process, it is recommended that the single plantwide factory overhead rate be used for allocating factory overhead.
ANS: F DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

25. In an effort to simplify the multiple production department factory overhead rate method, the same rate can be used for all departments.
ANS: F DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

26. Activity cost pools are cost accumulations associated with a given activity.
ANS: T DIF: Easy OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

27. Activity cost pools are assigned to products, using factory overhead rates for each activity.
ANS: T DIF: Easy OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

28. Activity rates are computed by dividing the cost budgeted for each activity pool by the estimated activity base for that pool.
ANS: T DIF: Easy OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

29. Direct labor hours is **not** a cost pool that is regularly used in the activity-based costing method.
ANS: F DIF: Easy OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

30. Estimated activity-base usage quantities are the total activity-base quantities related to each product
ANS: T DIF: Easy OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

31. Activity based costing is much easier to apply than single plantwide factory overhead allocation.
ANS: F DIF: Easy OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

32. Service organizations can use activity based costing to allocate selling and administrative costs to services provided.
ANS: T DIF: Easy OBJ: 26(11)-05
NAT: AACSB Analytic | IMA-Cost Management

33. ABC costing is used to allocate selling and administrative expenses to each product based on the product's individual differences in consuming these activities.
ANS: T DIF: Easy OBJ: 26(11)-05
NAT: AACSB Analytic | IMA-Cost Management

34. Activity Based Costing can be used to allocate period costs to various products that the company sells.
ANS: T DIF: Easy OBJ: 26(11)-05
NAT: AACSB Analytic | IMA-Cost Management

35. Activity based costing can only be used to allocate manufacturing factory overhead.
ANS: F DIF: Easy OBJ: 26(11)-05 | 26(11)-06
NAT: AACSB Analytic | IMA-Cost Management

36. In a service organization, multiple department overhead rate method is the most effective in providing information about the cost of services.
ANS: F DIF: Easy OBJ: 26(11)-06
NAT: AACSB Analytic | IMA-Cost Management

37. Service companies can effectively use multiple department overhead rate costing to compute product (service) costs.
ANS: F DIF: Easy OBJ: 26(11)-06
NAT: AACSB Analytic | IMA-Cost Management

38. Service companies can effectively use single facility wide overhead costing to compute product (service) costs.
ANS: F DIF: Easy OBJ: 26(11)-06
NAT: AACSB Analytic | IMA-Cost Management

39. Service companies can effectively use activity-based costing to compute product (service) costs.
ANS: T DIF: Easy OBJ: 26(11)-06
NAT: AACSB Analytic | IMA-Cost Management

MULTIPLE CHOICE

1. Which of the following is **not** a factory overhead allocation method?
   a. Single Plantwide Rate Method
   b. Multiple Production Department Rate Method
   c. Traditional Costing Method
   d. Activity-Based Costing Method
ANS: C DIF: Easy OBJ: 26(11)-01
NAT: AACSB Analytic | IMA-Cost Management

2. Which of the following does not support managerial decisions involving accurate product costing?
   a. product constraints
   b. emphasis of a product line
   c. product mix
   d. product price
ANS: A DIF: Moderate OBJ: 26(11)-01
NAT: AACSB Analytic | IMA-Cost Management

3. Lasso Corp. budgeted $250,000 of overhead cost for 2008. Actual overhead costs for the year were $240,000. Lasso's plant-wide allocation base, machine hours, was budgeted at 50,000 hours. Actual machine hours were 40,000. Budgeted units to be produced are 100,000 units. Lasso's plant-wide factory overhead rate for 2008 is:
   a. $1.25 per unit
   b. $6.00 per machine hour
   c. $6.25 per machine hour
   d. $5.00 per machine hour
ANS: D DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

4. Hoskins Co. uses a plant-wide factory overhead rate based on direct labor hours. Overhead costs would be overcharged to which of the following departments?
   a. A labor-intensive department
   b. A capital-intensive department
   c. A materials-intensive department
   d. None of the above

ANS: A DIF: Difficult OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

5. Stewart Marketing Inc. manufactures two products, A and B. Presently, the company uses a single plant-wide factory overhead rate for allocating overhead to products. However, management is considering moving to a multiple department rate system for allocating overhead. From the following information, determine the plant-wide factory overhead rate:

		Direct	Product	
	Overhead	Labor Hours	A	B
Painting Dept.	$248,000	10,000	16	4
Finishing Dept.	72,000	10,000	4	16
Totals	$320,000	20,000	20	20

   a. $24.80 per dlh
   b. $32.00 per dlh
   c. $16.00 per dlh
   d. $ 7.20 per dlh

ANS: C DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

6. Stewart Marketing Inc. manufactures two products, A and B. Presently, the company uses a single plant-wide factory overhead rate for allocating overhead to products. However, management is considering moving to a multiple department rate system for allocating overhead. From the following information, using a single plant-wide rate, determine the overhead rate per unit for Product A:

		Direct Labor	Product	
	Overhead	Hours (dlh)	A	B
Painting Dept.	$248,000	10,000 dlh	16 dlh	4 dlh
Finishing Dept.	72,000	10,000	4	16
Totals	$320,000	20,000 dlh	20 dlh	20 dlh

   a. $320.00 per unit
   b. $496.00 per unit
   c. $144.00 per unit
   d. $640.00 per unit

ANS: A DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

7. Stewart Marketing Inc. manufactures two products, A and B. Presently, the company uses a single plant-wide factory overhead rate for allocating overhead to products. However, management is considering moving to a multiple department rate system for allocating overhead. From the following information, using a single plant-wide rate, determine the overhead rate per unit for Product B:

	Overhead	Direct Labor Hours (dlh)	Product A	Product B
Painting Dept.	$248,000	10,000 dlh	16 dlh	4 dlh
Finishing Dept.	72,000	10,000	4	16
Totals	$320,000	20,000 dlh	20 dlh	20 dlh

a. $496.00
b. $144.00
c. $640.00
d. $320.00

ANS: D DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

8. The Delph Company produces two products, Blinks and Dinks. They are manufactured in two departments, Fabrication and assembly. Data for the products and departments are listed below.

Product	Number of units	Labor hrs per unit	Machine hours per unit
Blinks	1,000	4	5
Dinks	2,000	2	8

All of the Machine hours take place in the Fabrication department, which has an estimated overhead of $84,000. All of the labor hours take place in the Assembly department, which has an estimated total overhead of $72,000.

The Delph Company uses a single overhead rate to apply all overhead costs based on labor hours. What is the overhead cost per unit for Blinks?

a. $78
b. $18
c. $72
d. $14.40

ANS: A DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

9. The Delph Company produces two products, Blinks and Dinks. They are manufactured in two departments, Fabrication and assembly. Data for the products and departments are listed below.

Product	Number of units	Labor hrs per unit	Machine hours per unit
Blinks	1,000	4	5
Dinks	2,000	2	8

All of the Machine hours take place in the Fabrication department, which has an estimated overhead of $84,000. All of the labor hours take place in the Assembly department, which has an estimated total overhead of $72,000.

The Delph Company uses a single overhead rate to apply all overhead costs based on labor hours. What is the overhead cost per unit for Dinks?

a. $36
b. $39
c. $19.50
d. $52

ANS: B DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

10. The Delph Company produces two products, Blinks and Dinks. They are manufactured in two departments, Fabrication and assembly. Data for the products and departments are listed below.

Product	Number of units	Labor hrs per unit	Machine hours per unit
Blinks	1,000	4	5
Dinks	2,000	2	8

All of the Machine hours take place in the Fabrication department, which has an estimated overhead of $84,000. All of the labor hours take place in the Assembly department, which has an estimated total overhead of $72,000.

The Delph Company uses a single overhead rate to apply all overhead costs based on labor hours. What would the single plant-wide rate be?

a. $9
b. $52
c. $19.50
d. $18.00

ANS: C DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

11. Common allocation bases are

a. direct labor dollars, direct labor hours, and square footage
b. direct labor dollars, direct labor hours, machine hours
c. direct labor dollars, direct labor hours, and machine dollars
d. machine dollars, direct labor dollars, machine hours

ANS: B DIF: Easy OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

12. The Nite Lite Factory has determined that its budgeted factory overhead budget for the year is $6,750,000 and budgeted direct labor hours are 5,000,000. Using the single plantwide factory overhead rate based on direct labor hours, determine the factory overhead rate for the year.
    a. $1.35
    b. $1.20
    c. $.74
    d. cannot be determined

ANS: A DIF: Easy OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

13. The Nite Lite Factory has determined that its budgeted factory overhead budget for the year is $6,750,000 and budgeted direct labor hours are 5,000,000. If the actual direct labors for the period are 180,000 and direct labor hours is the allocation base, the factory overhead allocation using the single plantwide factory overhead rate is?
    a. $375,000
    b. $133,333
    c. $243,000
    d. cannot be determined

ANS: C DIF: Easy OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

14. Nite Lite Factory produces two similar products - small lamps and desk lamps. The total plant overhead budget is $640,000 with 400,000 estimated direct labor hours. It is further estimated that small lamp production will have 275,000 direct labor hours and desk lamp production will require 125,000 direct labor hours. Using the single plantwide factory overhead rate with an allocation base of direct labor hours, how much factory overhead will be allocated to the small lamp production if the actual direct hours for the period is 290,000?
    a. $220,690
    b. $400,000
    c. $440,000
    d. $464,000

ANS: D DIF: Easy OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

15. Nite Lite Factory produces two similar products - small lamps and desk lamps. The total plant overhead budget is $640,000 with 400,000 estimated direct labor hours. It is further estimated that small lamp production will have 275,000 direct labor hours and desk lamp production will require 125,000 direct labor hours. Using the single plantwide factory overhead rate with an allocation base of direct labor hours, how much factory overhead will be allocated to the desk lamp production if the actual direct hours for the period is 121,000?
    a. $220,690
    b. $200,000
    c. $193,600
    d. $279,000

ANS: C DIF: Easy OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

16. Nite Lite Factory produces two similar products - small lamps and desk lamps. The total plant overhead budget is $640,000 with 400,000 estimated direct labor hours. It is further estimated that small lamp production will use 3 direct labor hours for each unit and desk lamp production will require 1.25 direct labor hours for each unit. Using the single plantwide factory overhead rate with an allocation base of direct labor hours, how much factory overhead will be allocated to the desk lamp production if the actual production for the period is 121,000 units?
    a. $151,250
    b. $242,000
    c. $580,800
    d. $363,000

ANS: B DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

17. Nite Lite Factory produces two similar products - small lamps and desk lamps. The total plant budget is $640,000 with 400,000 estimated direct labor hours. It is further estimated that small lamp production will use 3 direct labor hours for each unit and desk lamp production will require 1.25 direct labor hours for each unit. Using the single plantwide factory overhead rate with an allocation base of direct labor hours, how much factory overhead will be allocated to the small lamp production if the actual production for the period is 108,000 units?
    a. $518,400
    b. $324,000
    c. $580,800
    d. $363,000

ANS: A DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

18. The Southwest Leather Company manufactures leather handbags (H) and moccasins (M). For simplicity reasons, they have decided to use the single plantwide factory overhead rate method to allocate factory overhead. The factory overhead estimated per unit together with direct materials and direct labor will help determine selling prices. Calculate the amount of factory overhead to be allocated to each unit using direct labor hours.
    Handbags = 60,000 units, 2 hours of direct labor
    Moccasins= 40,000 units, 3 hours of direct labor
    Total Budgeted factory overhead cost = $360,000
    a. (H) $1.50 , (M) $1.50
    b. (H) $3.00, (M) $4.50
    c. (H) $3.00, (M) $3.00
    d. (H) $2.40, (M) $2.40

ANS: B
Handbags: 60,000 units × 2 direct labor hours = 120,000 direct labor hours

Moccasins: 40,000 units × 3 direct labor hours = 120,000 direct labor hours
240,000 direct labor hours

Single plantwide factory overhead rate = $\frac{\$360,000}{240,000 \text{ DL hour}}$
= $1.50

DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

19. The Nite Lite Factory produces two products - small lamps and desk lamps. It has two separate departments - finishing and production. The overhead budget for the finishing department is $550,000, using 500,000 direct labor hours. The overhead budget for the production department is $400,000 using 80,000 direct labor hours. If the budget estimates that a small lamp will require 2 hours of finishing and 1 hours of production, how much factory overhead will be allocated to each unit of small lamps using the multiple production department factory overhead rate method with an allocation base of direct labor hours?
    a. $6.33
    b. $4.91
    c. $5.00
    d. $7.20

ANS: D DIF: Difficult OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

20. The Nite Lite Factory produces two products - small lamps and desk lamps. It has two separate departments - finishing and production. The overhead budget for the finishing department is $550,000, using 500,000 direct labor hours. The overhead budget for the production department is $400,000 using 80,000 direct labor hours. If the budget estimates that a desk lamp will require 1 hours of finishing and 2 hours of production, how much factory overhead will be allocated to each unit of desk lamps using the multiple production department factory overhead rate method with an allocation base of direct labor hours?
    a. $11.10
    b. $4.91
    c. $5.00
    d. $10.00

ANS: A DIF: Difficult OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

21. The Nite Lite Factory produces two products - small lamps and desk lamps. It has two separate departments - finishing and production. The overhead budget for the finishing department is $550,000, using 500,000 direct labor hours. The overhead budget for the production department is $400,000 using 80,000 direct labor hours. If the budget estimates that a small lamp will require 2 hours of finishing and 1 hours of production, what is the total amount of factory overhead to be allocated to small lamps using the multiple production department factory overhead rate method with an allocation base of direct labor hours, if 75,000 units are produced?
    a. $400,000
    b. $540,000
    c. $550,000
    d. $368,250

ANS: B DIF: Difficult OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

22. The Nite Lite Factory produces two products - small lamps and desk lamps. It has two separate departments - finishing and production. The overhead budget for the finishing department is $550,000, using 500,000 direct labor hours. The overhead budget for the production department is $400,000 using 80,000 direct labor hours. If the budget estimates that a desk lamp will require 1 hours of finishing and 2 hours of production, what is the total amount of factory overhead to be allocated to desk lamps using the multiple production department factory overhead rate method with an allocation base of direct labor hours, if 26,000 units are produced?
    a. $540,000
    b. $300,000
    c. $400,000
    d. $288,600

ANS: D DIF: Difficult OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

23. Using multiple department factory overhead rates instead of a single plant-wide factory overhead rate:
    a. results in more accurate product costs
    b. results in distorted product costs
    c. is simpler and less costly
    d. applies overhead costs to all departments equally

ANS: A DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

24. Zinn Co. uses 3 machine hours and 1 direct labor hour to produce Product X. It uses 4 machine hours and 8 direct labor hours to produce Product Y. Zinn's Assembly and Finishing Departments have factory overhead rates of $240 per machine hour and $160 per direct labor hour, respectively. How much overhead cost will be charged to the two products?
    a. Product X = $240; Product Y = $160
    b. Product X = $400; Product Y = $400
    c. Product X = $880; Product Y = $2,240
    d. Product X = $720; Product Y = $1,280

ANS: C DIF: Moderate OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

25. Using a plant-wide factory overhead rate distorts product costs when:
    a. products require different ratios of allocation-base usage in each production department
    b. significant differences exist in the factory overhead rates used across different production departments
    c. both A and B exist
    d. either A or B exist

ANS: C DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

26. Stewart Marketing Inc. manufactures two products, A and B. Presently, the company uses a single plant-wide factory overhead rate for allocating overhead to products. However, management is considering moving to a multiple department rate system for allocating overhead. From the following information, determine the overhead rate in the Painting Department for each unit of Product B if the company uses a multiple department rate system.

	Overhead	Direct Labor Hours (dlh)	Product A	Product B
Painting Dept.	$248,000	10,000 dlh	16 dlh	4 dlh
Finishing Dept.	72,000	10,000	4	16
Totals	$320,000	20,000 dlh	20 dlh	20 dlh

a. $12.40 per dlh
b. $24.80 per dlh
c. $7.20 per dlh
d. $3.60 per dlh

ANS: B DIF: Moderate OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

27. Stewart Marketing Inc. manufactures two products, A and B. Presently, the company uses a single plant-wide factory overhead rate for allocating overhead to products. However, management is considering moving to a multiple department rate system for allocating overhead. From the following information, determine the overhead rate in the Finishing Department for each unit of Product A if the company uses a multiple department rate system.

	Overhead	Direct Labor Hours (dlh)	Product A	Product B
Painting Dept.	$248,000	10,000 dlh	16 dlh	4 dlh
Finishing Dept.	72,000	10,000	4	16
Totals	$320,000	20,000 dlh	20 dlh	20 dlh

a. $24.80 per dlh
b. $12.40 per dlh
c. $3.60 per dlh
d. $7.20 per dlh

ANS: D DIF: Moderate OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

28. Stewart Marketing Inc. manufactures two products, A and B. Presently, the company uses a single plant-wide factory overhead rate for allocating overhead to products. However, management is considering moving to a multiple department rate system for allocating overhead. From the following information, determine the overhead from both production departments allocated to each unit of Product A if the company uses a multiple department rate system.

	Overhead	Direct Labor Hours (dlh)	Product A	Product B
Painting Dept.	$248,000	10,000 dlh	16 dlh	4 dlh
Finishing Dept.	72,000	10,000	4	16
Totals	$320,000	20,000 dlh	20 dlh	20 dlh

a. $396.80 per unit
b. $425.60 per unit
c. $320.00 per unit
d. $214.40 per unit

ANS: B DIF: Moderate OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

29. Stewart Marketing Inc. manufactures two products, A and B. Presently, the company uses a single plant-wide factory overhead rate for allocating overhead to products. However, management is considering moving to a multiple department rate system for allocating overhead. From the following information, determine the overhead from both production departments allocated to each unit of Product B if the company uses a multiple department rate system.

	Overhead	Direct Labor Hours (dlh)	Product A	Product B
Painting Dept.	$248,000	10,000 dlh	16 dlh	4 dlh
Finishing Dept.	72,000	10,000	4	16
Totals	$320,000	20,000 dlh	20 dlh	20 dlh

a. $425.60 per unit
b. $99.20 per unit
c. $214.40 per unit
d. $320.00 per unit

ANS: C DIF: Moderate OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

The Delph Company produces two products, Blinks and Dinks. They are manufactured in two departments, Fabrication and assembly. Data for the products and departments are listed below.

Product	Number of units	Labor hrs per unit	Machine hours per unit
Blinks	1,000	4	5
Dinks	2,000	2	8

All of the Machine hours take place in the Fabrication department, which has an estimated overhead of $84,000. All of the labor hours take place in the Assembly department, which has an estimated total overhead of $72,000.

The Delph Company uses a departmental overhead rates. The fabrication department uses machine hours for an allocation base, and the assembly department uses labor hours.

30. What is the assembly department overhead rate per labor hour?
    a. $9.00
    b. $19.50
    c. $24.00
    d. $7.00

ANS: A DIF: Moderate OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

31. What is the overhead cost per unit for Blinks?
    a. $50
    b. $56
    c. $44
    d. $64

ANS: B DIF: Moderate OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

32. What is the overhead cost per unit for Dinks?
    a. $50
    b. $56
    c. $64
    d. $44

ANS: A DIF: Moderate OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

33. What is the fabrication department overhead rate per machine hour?
    a. $7.43
    b. $16.80
    c. $28.00
    d. $4.00

ANS: D DIF: Moderate OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

34. All of the following can be used as an allocation base for calculating factory overhead rates except:
    a. Direct labor dollars
    b. Direct labor hours
    c. Square footage
    d. Total overhead expenses

ANS: D DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

35. Which two are the most common allocation bases for factory overhead?
    a. Square footage and machine hours
    b. Direct labor hours and machine hours
    c. Direct labor hours and factory expenses
    d. Machine hours and factory expenses

ANS: B DIF: Easy OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

Phelan Systems Corporation is estimating activity costs associated with producing disk drives, tapes drives, and wire drives. The indirect labor can be traced to four separate activity pools. The budgeted activity cost and activity base information, along with the estimated activity-base information, is provided below.

	Activity Cost	Activity Base
Procurement	$ 360,000	Number of purchase orders
Scheduling	240,000	Number of production orders
Materials handling	480,000	Number of moves
Product development	720,000	Number of engineering changes
Production	1,420,000	Machine hours

	Number of Purchase Orders	Number of Production Orders	Number of Moves	Number of Engineering Changes	Machine Hours	Number of Units
Disk drives	4,000	300	1,400	10	2,000	2,000
Tape drives	2,000	150	600	5	8,000	4,000
Wire drives	12,000	800	4,000	25	10,000	2,500

36. Determine the activity rate for procurement per purchase order.
    a. $192
    b. $20
    c. $80
    d. $71

ANS: B DIF: Moderate OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

37. Determine the activity rate per purchase order for scheduling.
    a. $192
    b. $20
    c. $80
    d. $71

ANS: A DIF: Moderate OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

38. Determine the activity rate for materials handling per move.
    a. $192
    b. $20
    c. $71
    d. $80

ANS: D DIF: Moderate OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

39. Determine the activity rate for product development per change.
    a. $72,000
    b. $28,000
    c. $36,000
    d. $18,000

ANS: D DIF: Moderate OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

40. Phelan Systems Corporation is estimating activity costs associated with producing disk drives, tapes drives, and wire drives. The indirect labor can be traced to four separate activity pools. The budgeted activity cost and activity base information, along with the estimated activity-base information, is provided below.

	Activity Cost	Activity Base
Procurement	$ 360,000	Number of purchase orders
Scheduling	240,000	Number of production orders
Materials handling	480,000	Number of moves
Product development	720,000	Number of engineering changes
Production	1,420,000	Machine hours

	Number of Purchase Orders	Number of Production Orders	Number of Moves	Number of Engineering Changes	Machine Hours	Number of Units
Disk drives	4,000	300	1,400	10	2,000	2,000
Tape drives	2,000	150	600	5	8,000	4,000
Wire drives	12,000	800	4,000	25	10,000	2,500

Determine the activity rate for production per machine hour.

a. $20
b. $192
c. $71
d. $80

ANS: C DIF: Moderate OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

41. Phelan Systems Corporation is estimating activity costs associated with producing disk drives, tapes drives, and wire drives. The indirect labor can be traced to four separate activity pools. The budgeted activity cost and activity base information, along with the estimated activity-base information, is provided below.

	Activity Cost	Activity Base
Procurement	$ 360,000	Number of purchase orders
Scheduling	240,000	Number of production orders
Materials handling	480,000	Number of moves
Product development	720,000	Number of engineering changes
Production	1,420,000	Machine hours

	Number of Purchase Orders	Number of Production Orders	Number of Moves	Number of Engineering Changes	Machine Hours	Number of Units
Disk drives	4,000	300	1,400	10	2,000	2,000
Tape drives	2,000	150	600	5	8,000	4,000
Wire drives	12,000	800	4,000	25	10,000	2,500

Determine the activity-based cost for each disk drive unit.

a. $193.70
b. $192.00
c. $142.90
d. $285.80

ANS: D DIF: Moderate OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

42. Phelan Systems Corporation is estimating activity costs associated with producing disk drives, tapes drives, and wire drives. The indirect labor can be traced to four separate activity pools. The budgeted activity cost and activity base information, along with the estimated activity-base information, is provided below.

	Activity Cost	Activity Base
Procurement	$ 360,000	Number of purchase orders
Scheduling	240,000	Number of production orders
Materials handling	480,000	Number of moves
Product development	720,000	Number of engineering changes
Production	1,420,000	Machine hours

	Number of Purchase Orders	Number of Production Orders	Number of Moves	Number of Engineering Changes	Machine Hours	Number of Units
Disk drives	4,000	300	1,400	10	2,000	2,000
Tape drives	2,000	150	600	5	8,000	4,000
Wire drives	12,000	800	4,000	25	10,000	2,500

Determine the activity-based cost for each tape drive unit.

a. $192.00
b. $193.70
c. $285.80
d. $387.40

ANS: B DIF: Moderate OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

43. Phelan Systems Corporation is estimating activity costs associated with producing disk drives, tapes drives, and wire drives. The indirect labor can be traced to four separate activity pools. The budgeted activity cost and activity base information, along with the estimated activity-base information, is provided below.

	Activity Cost	Activity Base
Procurement	$ 360,000	Number of purchase orders
Scheduling	240,000	Number of production orders
Materials handling	480,000	Number of moves
Product development	720,000	Number of engineering changes
Production	1,420,000	Machine hours

	Number of Purchase Orders	Number of Production Orders	Number of Moves	Number of Engineering Changes	Machine Hours	Number of Units
Disk drives	4,000	300	1,400	10	2,000	2,000
Tape drives	2,000	150	600	5	8,000	4,000
Wire drives	12,000	800	4,000	25	10,000	2,500

Determine the activity-based cost for each wire drive unit.
a. $187.36
b. $192.00
c. $749.44
d. $468.40

ANS: C DIF: Moderate OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

44. Which of the following is **not** a cost pool used with the activity-based costing method?
a. Direct Labor Hours
b. Production Setups
c. Engineering
d. All are used.

ANS: D DIF: Easy OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

45. Activity rates are determined by
a. dividing the actual cost for each activity pool by the actual activity base for that pool.
b. dividing the cost budgeted for each activity pool by the estimated activity base for that pool.
c. dividing the actual cost for each activity pool by the estimated activity base for that pool.
d. dividing the cost budgeted for each activity pool by the actual activity base in that pool.

ANS: B DIF: Easy OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

46. Nite Lite Company is changing to an activity-based costing method. They have determined that they will use three cost pools. They are set-ups, inspections, and assembly. Which of the following would be used as the activity base for assembly?
    a. direct labor hours
    b. inventory cost
    c. inspections
    d. number of units to be produced

ANS: A DIF: Easy OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

47. Using the following information prepared by the Nite Lite Company, determine the activity rate for set-ups.

Activity Pool	Activity Base	Budgeted Amount
Set-ups	10,000	$60,000
Inspections	24,000	$120,000
Assembly (DLH)	80,000	$400,000

    a. $60.00
    b. $6.00
    c. $.06
    d. $.60

ANS: B DIF: Easy OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

48. The Nite Lite Company manufactures small lamps and desk lamps. The following shows the activities per product:

	Set-ups	Inspections	Assembly (DLH)
Small Lamps - 4,000 units	1	4	1
Desk Lamps - 8,000 units	2	1	3

    Using the following information prepared by the Nite Lite Company, determine the factory overhead rate to be charged to each unit of small lamps.

Activity Pool	Activity Base	Budgeted Amount
Set-ups	20,000	$60,000
Inspections	24,000	$120,000
Assembly (DLH)	28,000	$420,000

    a. $38.00
    b. $35.00
    c. $10.00
    d. $20.00

ANS: A DIF: Moderate OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

49. The Nite Lite Company manufactures small lamps and desk lamps. The following shows the activities per product:

	Set-ups	Inspections	Assembly (DLH)
Small Lamps - 4,000 units	4,000	16,000	4,000
Desk Lamps - 8,000 units	16,000	8,000	24,000

Using the following information prepared by the Nite Lite Company, determine the total factory overhead rate to be charged to desk lamps.

Activity Pool	Activity Base	Budgeted Amount
Set-ups	24,000	$60,000
Inspections	24,000	$120,000
Assembly (DLH)	28,000	$280,000

a. $380,000
b. $320,000
c. $140,000
d. cannot be determined

ANS: B DIF: Moderate OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

50. The Nite Lite Company manufactures small lamps and desk lamps. The following shows the activities per product:

	Set-ups	Inspections	Assembly (DLH)
Small Lamps - 4,000 units	4,000	16,000	4,000
Desk Lamps - 8,000 units	16,000	8,000	24,000

Using the following information prepared by the Nite Lite Company, determine the total factory overhead rate to be charged to small lamps.

Activity Pool	Activity Base	Budgeted Amount
Set-ups	20,000	$60,000
Inspections	24,000	$120,000
Assembly (DLH)	28,000	$420,000

a. $380,000
b. $240,000
c. $152,000
d. cannot be determined

ANS: C DIF: Moderate OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

51. If selling and administrative expenses are allocated to different products, they should be reported as
    a. product cost
    b. contra sales account
    c. period cost
    d. cost of goods sold

ANS: C DIF: Moderate OBJ: 26(11)-05
NAT: AACSB Analytic | IMA-Cost Management

52. Activity based costing for selling and administrative expenses can also be beneficial in allocating expenses to various products. Which of the following can be used as a base in allocating help desk costs?
    a. Number of calls
    b. Square footage of the help desk office
    c. Number of products sold
    d. Number of field failures

ANS: A DIF: Easy OBJ: 26(11)-05
NAT: AACSB Analytic | IMA-Cost Management

53. A bank may decide to use activity-based costing to determine all of the following except:
    a. the amounts charged to customers for services provided
    b. service quality
    c. profitability by services provided
    d. all are correct

ANS: B DIF: Moderate OBJ: 26(11)-06
NAT: AACSB Analytic | IMA-Cost Management

The It's All About Hair Salon uses an activity-based costing system in its beauty salon to determine the cost of services. The salon has determined the costs of services by activity as follows:

Activity	Activity Rate
Hair Washing	$2.50
Conditioning	$3.00
Chemical Treatment	$25.00
Styling	$10.00

	Hair Washing	Conditioning	Chemical Treatment	Styling
Hair Cut	1	1	0	0
Complete Style	1	1	0	1
Perms	2	3	1	1
Hi-Lights	3	4	2	1

54. Determine the cost of services for a hair cut?
    a. $2.00
    b. $5.50
    c. $3.00
    d. $10.00

ANS: B DIF: Easy OBJ: 26(11)-06
NAT: AACSB Analytic | IMA-Cost Management

55. Determine the cost of services for a perm?
    a. $49.00
    b. $5.50
    c. $54.00
    d. $29.00

ANS: A DIF: Easy OBJ: 26(11)-06
NAT: AACSB Analytic | IMA-Cost Management

56. An airline can allocate overhead costs to each flight by using activity based costing by first identifying activity drivers, then allocating costs to the different flights. All but one of the following could be a viable activity drivers.
    a. Baggage handlers
    b. Pilots
    c. No. of tickets sold
    d. Number of inspections

ANS: B DIF: Easy OBJ: 26(11)-06
NAT: AACSB Analytic | IMA-Cost Management

EXERCISE/OTHER

1. The total factory overhead for Nite Lite Company is budgeted for the year at $800,000. Nite Lite manufactures two different products - night lights and desk lamps. Night lights is budgeted for 30,000 units, each unit requiring two hours of direct labor per unit. Desk lamps, on the other hand, is budgeted for 40,000 units, each unit requiring two and a half hours of direct labor per unit. Determine (a) the total number of budgeted direct labor hours for year, (b) the single plantwide factory overhead rate using direct labor hours as the allocation base, and (c) the factory overhead allocated per unit for each product using the single plantwide factory overhead rate using direct labor hours as the allocation base.

ANS:
(a) (30,000 * 2) + (40,000 * 2.5) = 160,000 direct labor hours

(b) $800,000 / 160,000 = $5 per direct labor hour

(c) Night Lights = $5 * 2 = $10
Desk Lamps = $5 * 2.5 = $12.5

DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management TOP: Example Exercise 26(11)-1

2. Explain why it is imperative that proper factory overhead be allocated in factories that produce multiple products.

ANS:
Proper allocation of factory overhead avoids ‘bad pricing’. If too much overhead is allocated to a unit, then overpricing could be the outcome. On the other hand, if a product is not charged enough overhead, then underpricing could occur. Both situations can be very detrimental to the profits of the company.

DIF: Difficult OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

3. The Camp Gear Factory produces two products - canopies and tents. It has two separate departments - cutting and sewing. The budget for the cutting department is $350,000 and $400,000 for the sewing department. Each canopy will require 2 hours of cutting and 1 hour of sewing. Each tent will require 1 hour of cutting and 6 hours of sewing. The budget estimates that 20,000 canopies and 10,000 tents will need to be manufactured for the year. Determine (a) the total number of budgeted direct labor hours for the year in each department, (b) the departmental factory overhead rates for both departments and (c) the factory overhead allocated per unit each product using the department factory overhead allocation rates using direct labor hours as the base.

ANS:

(a)

Cutting: (20,000 canopies * 2 dlh) + (10,000 tents * 1 dlh) = 50,000 direct labor hours
Sewing: (20,000 canopies * 1 dlh) + (10,000 tents * 6 dlh) = 80,000 direct labor hours

(b)

Cutting: $350,000 / 50,000 dlh = $7.00
Sewing: $400,000 / 80,000 dlh = $5.00

(c) Canopy:

Cutting: 2 dlh * $7.00 =	$14.00
Sewing: 1 dlh * $5.00 =	5.00
Tot. FOH per canopy =	$ 19.00

Tent:

Cutting: 1 dlh * $7.00 =	$ 7.00
Sewing: 6 dlh * $5.00 =	30.00
Tot. FOH per tent =	$37.00

DIF: Moderate OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management TOP: Example Exercise 26(11)-2

4. The Nite Lite Company manufactures small lamps and desk lamps. The following shows the activities per product:

	Set-ups	Inspections	Assembly (DLH)
Small Lamps - 8,000 units	8,000	32,000	8,000
Desk Lamps - 16,000 units	32,000	16,000	48,000

Using the following information prepared by the Nite Lite Company, determine (a) the activity rates for each activity and (b) the activity based factory overhead per unit for each product.

Activity Pool	Activity Base	Budgeted Amount
Set-ups	40,000	$160,000
Inspections	48,000	$192,000
Assembly (DLH)	56,000	$336,000

ANS:
(a) Set-ups: $160,000 / 40,000 = $4
Inspections: $192,000 / 48,000 = $4
Assembly: $336,000 / 56,000 = $6

(b) Small Lamp: (8,000 * $4) + (32,000* $4) + (8,000 * $6) = $208,000 /8,000= $26
Desk Lamp: (32,000 * $4) + (16,000 * $4) + (48,000 * $6) = $480,000/16,000 =$30

DIF: Moderate OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management TOP: Example Exercise 26(11)-3

5. Southwest China Company sells glasses, fine china, and everyday dinnerware. They use activity-based costing to determine the cost of the shipping and handling activity. The shipping and handling activity has an activity rate of $7 per pound. A box of glasses weigh 2 lbs, the box of china weighs 4 lbs, and a box of everyday dinnerware weighs 6 lbs. (a) Determine the shipping and handling activity for each product and (b) determine the total shipping and receiving costs for the china if 3,500 boxes are shipped.

ANS:
(a) Glasses: 2 lbs * $7 = $14
China: 4 lbs * $7 = $28
Everyday dinnerware: 6 lbs * $7 = $42
(b) $28 * 3,500 = $98,000

DIF: Easy OBJ: 26(11)-05
NAT: AACSB Analytic | IMA-Cost Management TOP: Example Exercise 26(11)-4

The It's All About Hair Salon uses an activity-based costing system in its beauty salon to determine the cost of services. The salon has determined the costs of services by activity as follows:

Activity	Activity Rate
Hair Washing	$2.50
Conditioning	$3.00
Chemical Treatment	$25.00
Styling	$10.00

	Hair Washing	Conditioning	Chemical Treatment	Styling
Hair Cut	1	1	0	0
Complete Style	1	1	0	1
Perms	2	3	1	1
Hi-Lights	3	4	2	1

6. Determine the cost of services for a hi-light?

ANS:

Hair washing	3	$2.50	$7.50
Conditioning	4	$3.00	12.00
Chemicals	2	$25.00	50.00
Style	1	$10.00	10.00
Total			$79.50

DIF: Moderate OBJ: 26(11)-06
NAT: AACSB Analytic | IMA-Cost Management TOP: Example Exercise 26(11)-5

PROBLEM

1. Arlon Co. manufactures three types of cookies: Fluffs, Crinkles, and Snaps. The production process is relatively simple, and factory overhead costs are allocated to products using a single plant-wide factory rate based on direct labor hours. Information for the month of May 2000, Arlon's first month of operations, follows:

	Budgeted Unit Volume	Direct Labor Hours per unit
Fluffs	80,000 boxes	0.10
Crinkles	60,000 boxes	0.20
Snaps	20,000 boxes	1.00

Arlon has budgeted direct labor costs for May at $4.50 per hour. Budgeted direct materials costs for May are: Fluffs, $0.85/unit; Crinkles $0.40/unit; and Snaps $0.30/unit.

Arlon's budgeted overhead costs for May are:

Indirect labor	$280,000
Utilities	65,000
Supplies	45,000
Depreciation	30,000
Total	$420,000

Assume that Arlon sells all the boxes it produces in May.

(a) Compute Arlon's plant-wide factory overhead rate for May.

(b) Compute May's product cost for each type of cookie.

(c) Does Arlon's use of a plant-wide factory overhead rate in any way distort May's product costs?

ANS:

(a) Budgeted overhead costs/Budgeted plant-wide allocation base = Plant-wide factory overhead rate

$420,000/40,000 direct labor hours = $10.50 per direct labor hour

(b)

Cost per box	Fluffs	Crinkles	Snaps
Direct materials	$0.85	$0.40	$ 0.30
Direct labor	0.45	0.90	4.50
Overhead	1.05	2.10	10.50
Total manufacturing cost	$2.35	$3.40	$15.30

(c) The bulk of Arlon's factory overhead costs are charged to the product (Snaps) that uses the bulk of the single allocation base, which may be an incorrect allocation of factory overhead costs.

DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

2. Nite Lite Factory produces two similar products - small lamps and desk lamps. The total plant budget is $800,000 with 640,000 estimated direct labor hours. It is further estimated that small lamp production will have 375,000 direct labor hours and desk lamp production will require 265,000 direct labor hours.
   (a) Determine the single plant factory overhead rate based on direct labor hours.
   (b) How much is the factory overhead cost per unit if each small lamp uses 3 hours per unit?
   (c) How much is the factory overhead cost per unit if each desk lamp uses 2.5 hours per unit?
   (d) How much total factory overhead will be allocated to the small lamp production if 130,000 units are produced during the period?
   (e) How much total factory overhead will be allocated to the desk lamp production if 104,000 are produced during the period?

ANS:
(a) $800,000 / 640,000 = $1.25 per direct labor hour
(b) 3 hours * $1.25 = $3.75
(c) 2.5 hours * $1.25 = $3.125
(d) $3.75 * 130,000 = $487,500
(e) $3.125 * 104,000 = $325,000

DIF: Moderate OBJ: 26(11)-02
NAT: AACSB Analytic | IMA-Cost Management

3. Powell Co. manufactures two products, A and B, in two production departments, Assembly and Finishing. Powell Co. expects to produce 10,000 units of Product A and 20,000 units of Product B in the coming year. Budgeted factory overhead costs for the coming year are:

Assembly	$310,000
Finishing	245,000
Total	$555,000

The machine hours expected to be used in the coming year are as follows:

	Assembly Dept.	Finishing Dept.
Product A	15,100	9,000
Product B	4,900	11,000
Total	20,000	20,000

(a) Compute the production department factory overhead rates.
(b) Compute the factory overhead per unit for each product.

ANS:

(a) Factory overhead rates:

Assembly Dept. = $310,000/20,000 mhr

= $15.50/mhr

Finishing Dept. = $245,000/20,000 mhr

= $12.25/mhr

(b) Factory overhead cost per unit:

Product A:	$15.50/mhr × 15,100 mhr	=	$234,050
	$12.25/mhr × 9,000 mhr	=	110,250
	Total		$344,300
Per unit:	$344,300/10,000	=	$34.43
Product B:	$15.50/mhr × 4,900 mhr	=	$ 75,950
	$12.25/mhr × 11,000 mhr	=	134,750
	Total		$210,700
Per unit:	$210,700/20,000	=	$10.535

DIF: Moderate OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

4. Wall Clocks Deluxe manufactures alarm clocks and wall clocks and allocates overhead based on direct labor hour. The production process is set up in three departments: assembly, finishing, and calibrating. The following is information regarding the direct labor used to produce one unit of the two clocks:

Per Unit Hours:	Assembly	Finishing	Calibrating
Alarm clocks	3	1	1
Wall clocks	2	3	2
	5	4	3

The budget includes the following factory overhead by department:

Assembly Department	$595,000
Finishing Department	$200,000
Calibrating Department	$140,000
Total	$935,000

Wall Clocks Deluxe is planning to manufacture 50,000 alarm clocks and 10,000 wall clocks.

(a) Determine the total number of hours that will be needed by department.

(b) Determine the factory overhead rate by department using the multiple production department factory overhead rate method.

(c) Determine the amount of factory overhead to be allocated to each unit of alarm clocks and wall clocks.

(d) Determine the amount of total factory overhead to be allocated to the alarm clocks and wall clocks.

ANS:

(a) Assembly: (3 dlh * 50,000) + (2 dlh * 10,000) = 170,000 dlh
Finishing: (1 dlh * 50,000) + (3 dlh * 10,000) = 80,000 dlh
Calibrating: (1 dlh * 50,000) + (2 dlh * 10,000) = 70,000 dlh

(b) Assembly: ($595,000 / 170,000) = $3.50 per direct labor hour
Finishing: ($200,000 / 80,000) = $2.50 per direct labor hour
Calibrating: ($140,000 / 70,000) = $2.00 per direct labor hour

(c) Alarm Clock: (3 dlh * $3.50) + (1 dlh * $2.50) + (1 dlh * $2.00) = $15.00 per unit
Wall Clock : (2 dlh * $3.50) + (3 dlh * $2.50) + (2 dlh * $2.00) = $18.50 per unit

(d)

Alarm Clock: (50,000 units * $15.00) =	$750,000
Wall Clock: (10,000 units * $18.50) =	185,000
Total	$935,000

DIF: Moderate OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

5. The Southwest Leather Company manufactures leather handbags (H) and moccasins (M). The company has been using the factory overhead rate method but has decided to evaluate the multiple production department factory overhead rate to allocate factory overhead. The factory overhead estimated per unit together with direct materials and direct labor will help determine selling prices.
Handbags = 60,000 units, 2 hours of direct labor
Moccasins= 40,000 units, 3 hours of direct labor
Total Budgeted factory overhead cost = $360,000

The company has two different production departments: Cutting and Sewing. The cutting department has a factory overhead budget of $80,000. Each unit will require one direct labor hour or a total of 100,000 direct labor hours.

The Sewing Departments estimates factory overhead in the amount of $280,000. Each unit will require 1.4 direct labor hour and estimates a total of 140,000 direct labor hours.

Calculate the amount of factory overhead to be allocated to each unit using direct labor hours.

ANS:

Moccasins 3 hours total = (1 × $.80)* + (2 × $2.00)** = $.4.80 *40 000 =	$192,000
Handbags 2 hours total = (1 × $.80)* + (1 × $2.00)** = $ 2.80 *60,000 =	$168,000
Total Factory Overhead Allocation	$360,000

*Cutting Department Rate per Hour = $80,000 / 100,000 = $.80

**Sewing Department Rate per Hour = $280,000/140,000 = $2.00

DIF: Difficult OBJ: 26(11)-03
NAT: AACSB Analytic | IMA-Cost Management

6. Daisy Company produces two products, T and U. The indirect labor costs include the following two items:

Plant supervision	$600,000
Setup labor (indirect)	300,000
Total indirect labor	$900,000

The following activity-base usage and unit production information is available for the two products:

	Number of Setups	Direct Labor Hours	Units
Product T	100	25,000	1,000
Product U	300	25,000	1,000
Total	400	50,000	2,000

(a) Determine the single plant-wide factory overhead rate, using direct labor hours as the activity base.

(b) Determine the factory overhead cost per unit for Products T and U, using the single plant-wide factory overhead rate.

(c) Determine the activity rate for plant supervision and setup labor, assuming that the activity base for supervision is direct labor hours and the activity base for setup is number of setups.

(d) Determine the factory overhead cost per unit for Products T and U, using activity-based costing.

(e) Why is the factory overhead cost per unit different for the two products under the two methods?

ANS:

(a) Single plant-wide factory overhead rate = $900,000/50,000 dlh
= $18 per dlh

(b)

	Direct Labor Hours	×	Rate	=	Overhead	÷	Units	Overhead Per Unit
Product T	25,000		$18		$450,000		1,000	$450
Product U	25,000		$18		$450,000		1,000	$450

(c)

Activity rates:	Setup	Supervision
Activity cost	$300,000	$600,000
Activity base	÷ 400	÷ 50,000
Activity rate	$ 750 per setup	$ 12 per dlh
	========	========

(d)

Product T:	Activity-Base Usage	×	Activity Rate	=	Cost
Setup	100		$750		$ 75,000
Production	25,000		$ 12		300,000
Total					$375,000
Units					÷ 1,000
Factory overhead cost per unit					$ 375
					======

Product U:	Activity-Base Usage	×	Activity Rate	=	Activity Cost
Setup	300		$750		$225,000
Production	25,000		$ 12		300,000
Total					$525,000
Units					÷ 1,000
Factory overhead cost per unit					$ 525
					======

(e) The factory overhead cost per unit under the single plant-wide rate method is distorted because Product U consumes more setup-related activity, relative to the amount of direct labor consumed, than does Product T. Thus, the activity-based approach, which separates setup according to its own activity base, provides a more accurate estimate of the factory overhead cost per unit.

DIF: Moderate OBJ: 26(11)-02 | 26(11)-04
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The Taylor Corp. produces two products, saws and drills. Three activities are used in their manufacture. These activities and their associated costs and bases are as follows:

Activity	**Budgeted Costs**	**Activity Base**
Stamping	$180,000	Machine hours
Assembly	$390,000	Labor hours
Setup	$28,000	number of setups

Activity base	**Saws**	**Drills**	**Total**
machine hours	4,000	5,000	9,000
labor hours	6,500	13,000	19,500
number of setups	2	12	14
Units produced	400	600	

7. Determine the activity rate for each activity.
ANS:
Stamping: $20 per machine hour. $180,000/9,000
Assembly: $20 per labor hour. $390,000/19,500
Setup: $2,000 per setup. $28,000/14

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8. Determine the overhead cost per unit for each product.
ANS:
Saws: $535 per unit. [(4,000 × 20) + (6,500 × 20) + (2 × 2,000)]/400
Drills: $640 per unit. [(5,000 × 20) + (13,000 × 20) + (12 × 2,000)]/600

DIF: Moderate OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

9. The Southwest Leather Company manufactures leather handbags (H) and moccasins (M). The company has been using the factory overhead rate method but has decided to evaluate the activity based costing to allocate factory overhead. The factory overhead estimated per unit together with direct materials and direct labor will help determine selling prices.

Total Budgeted factory overhead cost = $360,000

Products	Cutting	Sewing	Set-Ups	QC Inspections	Purchase Orders
Handbags	60,000 dlh	60,000 dlh	500	200	100
Moccasins	40,000 dlh	80,000 dlh	300	800	300
Total	100,000 dlh	140,000 dlh	800 set-ups	1,000 inspect	400 PO's
Budget	$40,000	$210,000	$80,000	$20,000	$10,000

Calculate the amount of factory overhead to be allocated to each unit using activity based costing. The factory plans to produce 60,000 handbags, and 40,000 moccasins.

ANS:

Handbags:

Cutting - $40,000/100,000 * 60,000 =	$24,000
Sewing - $210,000/140,000 * 60,000=	90,000
Set-Ups - $80,000/800 * 500 =	50,000
QC Inspections - $20,000/1,000 * 200 =	4,000
PO's - $10,000/400 * 100 =	2,500
Total Allocation of Factory Overhead	$170,500 / 60,000=$2.84 per unit

Moccasins:

Cutting - $40,000/100,000 * 40,000 =	$16,000
Sewing - $210,000/140,000 * 80,000=	120,000
Set-Ups - $80,000/800 * 300 =	30,000
QC Inspections - $20,000/1,000 * 800 =	16,000
PO's - $10,000/400 * 300 =	7,500
Total Allocation of Factory Overhead	$189,500 / 40,000=$4.74 per unit

DIF: Difficult OBJ: 26(11)-04
NAT: AACSB Analytic | IMA-Cost Management

10. The It's All About Hair Salon uses an activity-based costing system in its beauty salon to determine the cost of services. The salon has determined the costs of services by activity as follows:

Activity	Activity Rate
Hair Washing	$1.50
Conditioning	$2.00
Chemical Treatment	$20.00
Styling	$10.00

(a) Using the following information determine the cost of services for each of the following services provided by the salon:

	Hair Washing	Conditioning	Chemical Treatment	Styling
Hair Cut	1	1	0	0
Complete Style	1	1	0	1
Perms	2	3	1	1
Hi-Lights	3	4	2	1

(b) If the company budgets 10,000 hair cuts, 4,000 complete styles, 3,500 perms, and 5,500 hi-lights, determine their budget for cost of services.

ANS:

(a) Hair Cuts : $1.50 + $2.00 = $3.50
Style : $1.50 + $2.00 + $10.00 = $13.50
Perms: ($1.50 * 2) +($2.00 * 3) + $20 + $10 = $39.00
Hi-Lights : ($1.50 * 3) + ($2.00 * 4) + ($20 * 2) + $10 = $62.50

(b)

Services	Per Unit Cost	Total # of Services	Total Costs
Hair Cut	$3.50	10,000	$35,000
Complete Style	$13.50	4,000	$54,000
Perms	$39.00	3,500	$136,500
Hi-Lights	$62.50	5.500	$343,750
Total			$569,250

DIF: Moderate OBJ: 26(11)-06
NAT: AACSB Analytic | IMA-Cost Management