CHAPTER 4 ACTIVITY-BASED COSTING

SUMMARY OF QUESTIONS BY LEARNING OBJECTIVES AND BLOOM’S TAXONOMY

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*This question covers a topic in an Appendix to the chapter.*

## SUMMARY OF LEARNING OBJECTIVES BY QUESTION TYPE

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### Learning Objective 4

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FOR INSTRUCTOR USE ONLY
Learning Objective #5

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Note:  
TF = True-False  
BE = Brief Exercise  
C = Completion  
MC = Multiple Choice  
Ex = Exercise

The chapter also contains one set of ten Matching questions and three Short-Answer Essay questions.

CHAPTER LEARNING OBJECTIVES

1. **Discuss the difference between traditional costing and activity-based costing.** A traditional costing system allocates overhead to products on the basis of predetermined plantwide or departmentwide rates such as direct labor or machine hours. An ABC system allocates overhead to identified activity cost pools, and then assigns costs to products using related cost drivers that measure the activities (resources) consumed.

The development of an activity-based costing system involves the following four steps. (1) Identify and classify the major activities involved in the manufacture of specific products and assign overhead to cost pools. (2) Identify the cost driver that has a strong correlation to the costs accumulated in each cost pool. (3) Compute the activity-based overhead rate for each cost pool. (4) Allocate overhead costs to products using the overhead rates determined for each cost pool.

2. **Apply activity-based costing to a manufacturer.** To identify activity cost pools, a company must perform an analysis of each operation or process, documenting and timing every task, action, or transaction. Cost drivers identified for assigning activity cost pools must (a) accurately measure the actual consumption of the activity by the various products and (b) have related data easily available. The overhead assigned to each activity cost pool is divided by the expected use of cost drivers to determine the activity-based overhead rate for the each pool. Overhead is allocated to products by multiplying a particular product’s expected use of a cost driver by the activity-based overhead rate. This is done for each activity cost pool and then summed.

3. **Explain the benefits and limitations of activity-based costing.** Features of ABC that make it a more accurate product costing system include (1) the increased number of cost pools used to assign overhead (including use of the activity-level hierarchy), (2) the enhanced control over overhead costs (including identification of non-value-added activities), and (3) the better management decisions it makes possible. The limitations of ABC are (1) the higher analysis and measurement costs that accompany multiple activity centers and cost drivers, and (2) the necessity still to allocate some costs arbitrarily.

4. **Apply activity-based costing to service industries.** The overall objective of using ABC in service industries is no different than for manufacturing industries—that is, improved costing of services performed (by job, service, contract, or customer). The general approach to costing is the same: analyze operations, identify activities, accumulate overhead costs by activity cost pools, and identify and use cost drivers to assign the cost pools to the services.

5. **Explain just-in-time (JIT) processing.** JIT is a processing system dedicated to having on hand the right materials and products just at the time they are needed, thereby reducing the amount of inventory and the time inventory is held. One of the principal accounting effects is that one account, Raw and In-Process Inventory, replaces both the raw materials and work in process inventory accounts.
TRUE-FALSE STATEMENTS

1. Traditional costing systems use multiple predetermined overhead rates.

2. Traditionally, overhead is allocated based on direct labor cost or direct labor hours.

3. Current trends in manufacturing include less direct labor and more overhead.

4. Activity-based costing allocates overhead to multiple cost pools and assigns the cost pools to products using cost drivers.

5. A cost driver does not generally have a direct cause-effect relationship with the resources consumed.

6. The first step in activity-based costing is to assign overhead costs to products, using cost drivers.

7. To achieve accurate costing, a high degree of correlation must exist between the cost driver and the actual consumption of the activity cost pool.

8. Low-volume products often require more special handling than high-volume products.

9. When overhead is properly assigned in ABC, it will usually decrease the unit cost of high-volume products.

10. ABC leads to enhanced control over overhead costs.

11. ABC usually results in less appropriate management decisions.

12. ABC is generally more costly to implement than traditional costing.

13. ABC eliminates all arbitrary cost allocations.

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14. ABC is particularly useful when product lines differ greatly in volume and manufacturing complexity.


15. ABC is particularly useful when overhead costs are an insignificant portion of total costs.


16. Activity-based management focuses on reducing costs and improving processes.


17. Any activity that increases the cost of producing a product is a value-added activity.


18. Engineering design is a value-added activity.


19. Non-value-added activities increase the cost of a product but not its perceived value.


20. Machining is a non-value-added activity.


21. Not all activities labeled non-value-added are totally wasteful, nor can they be totally eliminated.


22. Plant management is a batch-level activity.


23. Painting is a product-level activity.


24. The overall objective of installing ABC in service firms is no different than it is in a manufacturing company.


25. What sometimes makes implementation of activity-based costing difficult in service industries is that a smaller proportion of overhead costs are company-wide costs.


26. The general approach to identifying activities, activity cost pools, and cost drivers is used by a service company in the same manner as a manufacturing company.

27. Just-in-time strives to eliminate inventories by using a pull approach.


28. Quality control is less important in just-in-time than in traditional manufacturing philosophies.


29. Inventory storage costs are reduced in just-in-time processing.


30. Rework costs typically increase in just-in-time processing.


Answers to True-False Statements

<table>
<thead>
<tr>
<th>Item</th>
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<th>Item</th>
<th>Ans.</th>
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<th>Ans.</th>
<th>Item</th>
<th>Ans.</th>
<th>Item</th>
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</tr>
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</table>

MULTIPLE CHOICE QUESTIONS

31. Which of the following is not typical of traditional costing systems?
   a. Use of a single predetermined overhead rate.
   b. Use of direct labor hours or direct labor cost to assign overhead.
   c. Assumption of correlation between direct labor and incurrence of overhead cost.
   d. Use of multiple cost drivers to allocate overhead.


32. In traditional costing systems, overhead is generally applied based on
   a. direct labor.
   b. machine hours.
   c. direct material dollars.
   d. units of production.


33. An activity that has a direct cause-effect relationship with the resources consumed is a(n)
   a. cost driver.
   b. overhead rate.
   c. cost pool.
   d. product activity.

34. Which best describes the flow of overhead costs in an activity-based costing system?
   a. Overhead costs → direct labor cost or hours → products
   b. Overhead costs → products
   c. Overhead costs → activity cost pools → cost drivers → products
   d. Overhead costs → machine hours → products


35. The costs that are easiest to trace directly to products are
   a. direct materials and direct labor.
   b. direct labor and overhead.
   c. direct materials and overhead.
   d. none of the above; all three costs are equally easy to trace to the product.


36. Often the most difficult part of computing accurate unit costs is determining the proper amount of __________ to assign to each product, service, or job.
   a. direct materials
   b. direct labor
   c. overhead
   d. direct materials and direct labor


37. Predetermined overhead rates in traditional costing are often based on
   a. direct labor cost for job order costing and machine hours for process costing.
   b. machine hours for job order costing and direct labor cost for process costing.
   c. multiple bases for job order costing and direct labor cost for process costing.
   d. multiple bases for both job order costing and process costing.


38. Direct labor is sometimes the appropriate basis for assigning overhead cost to products. It is appropriate to use direct labor when which of the following is true?
   (1) Direct labor constitutes a significant part of total product cost.
   (2) A high correlation exists between direct labor and changes in the amount of overhead costs.
   a. (1) only
   b. (2) only
   c. Either (1) or (2)
   d. Both (1) and (2)


39. Advances in computerized systems, technological innovation, global competition, and automation have changed the manufacturing environment drastically by
   a. increasing direct labor costs and increasing overhead costs.
   b. increasing direct labor costs and decreasing overhead costs.
   c. decreasing direct labor costs and decreasing overhead costs.
   d. decreasing direct labor costs and increasing overhead costs.

40. Activity-based costing
   a. allocates overhead to activity cost pools, and it then assigns the activity cost pools to products and services by means of cost drivers.
   b. accumulates overhead in one cost pool, then assigns the overhead to products and services by means of a cost driver.
   c. assigns activity cost pools to products and services, then allocates overhead back to the activity cost pools.
   d. allocates overhead directly to products and services based on activity levels.


41. Ordering materials, setting up machines, assembling products, and inspecting products are examples of
   a. cost drivers.
   b. overhead cost pools.
   c. direct labor costs.
   d. nonmanufacturing activities.


42. An “Ordering and Receiving Materials” cost pool would most likely have as a cost driver:
   a. machine hours.
   b. number of setups.
   c. number of purchase orders.
   d. number of inspection tests.


43. Hartley Company produces two products, Flower and Planter. Flower is a high-volume item totaling 20,000 units annually. Planter is a low-volume item totaling only 6,000 units per year. Flower requires one hour of direct labor for completion, while each unit of Planter requires 2 hours. Therefore, total annual direct labor hours are 32,000 (20,000 + 12,000). Expected annual manufacturing overhead costs are $960,000. Hartley uses a traditional costing system and assigns overhead based on direct labor hours. Each unit of Planter would be assigned overhead of
   a. $30.00.
   b. $36.91.
   c. $60.00.
   d. need more information to compute.

44. Reynoso Corporation manufactures titanium and aluminum tennis racquets. Reynoso’s total overhead costs consist of assembly costs and inspection costs. The following information is available:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Titanium</th>
<th>Aluminum</th>
<th>Total Cost</th>
</tr>
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<tbody>
<tr>
<td>Assembly</td>
<td>500 mach.</td>
<td>500 mach.</td>
<td>$60,000</td>
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<td>hours</td>
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<td>Inspections</td>
<td>350</td>
<td>150</td>
<td>$100,000</td>
</tr>
<tr>
<td></td>
<td>2,100 labor hours</td>
<td>1,900 labor hours</td>
<td></td>
</tr>
</tbody>
</table>

Reynoso is considering switching from one overhead rate based on labor hours to activity-based costing.
Total overhead costs assigned to titanium racquets, using a single overhead rate, are
a. $80,000.
   b. $84,000.
   c. $100,000.
   d. $112,000.


45. Reynoso Corporation manufactures titanium and aluminum tennis racquets. Reynoso’s total overhead costs consist of assembly costs and inspection costs. The following information is available:

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<td></td>
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<td>1,900 labor hours</td>
<td></td>
</tr>
</tbody>
</table>

Reynoso is considering switching from one overhead rate based on labor hours to activity-based costing.
Using activity-based costing, how much assembly cost is assigned to titanium racquets?
   a. $21,000.
   b. $30,000.
   c. $31,500.
   d. $42,000.


46. Reynoso Corporation manufactures titanium and aluminum tennis racquets. Reynoso’s total overhead costs consist of assembly costs and inspection costs. The following information is available:

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<th>Titanium</th>
<th>Aluminum</th>
<th>Total Cost</th>
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<td>500 mach.</td>
<td>$45,000</td>
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<td></td>
<td>hours</td>
<td>hours</td>
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<td>Inspections</td>
<td>350</td>
<td>150</td>
<td>$75,000</td>
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<td></td>
<td>2,100 labor hours</td>
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Reynoso is considering switching from one overhead rate based on labor hours to activity-based costing.
Using activity-based costing, how much inspections cost is assigned to titanium racquets?
   a. $30,000.
   b. $47,500.
   c. $50,000.
   d. $70,000.

47. Tidwell Industries has the following overhead costs and cost drivers. Direct labor hours are estimated at 100,000 for the year.

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Cost Driver</th>
<th>Est. Overhead</th>
<th>Cost Driver Activity</th>
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<td>Ordering and Receiving</td>
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<td>500 orders</td>
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<tr>
<td>Machine Setup</td>
<td>Setups</td>
<td>297,000</td>
<td>450 setups</td>
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<tr>
<td>Machining</td>
<td>Machine hours</td>
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<td>125,000 MH</td>
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<td>Assembly</td>
<td>Parts</td>
<td>1,200,000</td>
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<tr>
<td>Inspection</td>
<td>Inspections</td>
<td>300,000</td>
<td>500 inspections</td>
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If overhead is applied using traditional costing based on direct labor hours, the overhead application rate is
a. $9.60.
b. $12.00.
c. $15.00.
d. $34.17.


48. Tidwell Industries has the following overhead costs and cost drivers. Direct labor hours are estimated at 100,000 for the year.

<table>
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<th>Activity Cost Pool</th>
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<td>Inspections</td>
<td>300,000</td>
<td>500 inspections</td>
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If overhead is applied using activity-based costing, the overhead application rate for ordering and receiving is
a. $1.20 per direct labor hour.
b. $240 per order.
c. $0.12 per part.
d. $6,834 per order.


49. The last step in activity-based costing is to
a. assign overhead costs to products, using overhead rates determined for each cost pool.
b. compute the activity-based overhead rate per cost driver.
c. identify and classify the activities involved in the manufacture of specific products, and allocate overhead to cost pools.
d. identify the cost driver that has a strong correlation to the activity cost pool.


50. The first step in activity-based costing is to
a. assign overhead costs to products, using overhead rates determined for each cost pool.
b. compute the activity-based overhead rate per cost driver.
c. identify and classify the activities involved in the manufacture of specific products, and allocate overhead to cost pools.
d. identify the cost driver that has a strong correlation to the activity cost pool.

51. A well-designed activity-based costing system starts with
   a. identifying the activity-cost pools.
   b. computing the activity-based overhead rate.
   c. assigning overhead costs to products.
   d. analyzing the activities performed to manufacture a product.


52. Which of the following is not an example of an activity cost pool?
   a. Setting up machines
   b. Machining
   c. Inspecting
   d. Machine hours


53. An example of an activity cost pool is
   a. machine hours.
   b. setting up machines.
   c. number of setups.
   d. number of inspections.


54. Estimated costs for activity cost pools and other item(s) are as follows:

   Machining $500,000
   Assembling 200,000
   Advertising 450,000
   Inspecting and testing 175,000

   Total estimated overhead is
   a. $700,000.
   b. $875,000.
   c. $1,150,000.
   d. $1,325,000.


55. An example of a cost which would not be assigned to an overhead cost pool is
   a. indirect salaries.
   b. freight-out.
   c. depreciation.
   d. supplies.


56. One of Matheny Company's activity cost pools is inspecting, with estimated overhead of $200,000. Matheny produces throw rugs (700 inspections) and area rugs (1,300 inspections). How much of the inspecting cost pool should be assigned to throw rugs?
   a. $70,000.
   b. $100,000.
   c. $107,692.
   d. $200,000.

57. Which would be an appropriate cost driver for the machining activity cost pool?
   a. Machine setups
   b. Purchase orders
   c. Machine hours
   d. Inspections


58. Which would be an appropriate cost driver for the purchasing activity cost pool?
   a. Machine setups
   b. Purchase orders
   c. Machine hours
   d. Inspections


59. An activity-based overhead rate is computed as follows:
   a. actual overhead divided by actual use of cost drivers.
   b. estimated overhead divided by actual use of cost drivers.
   c. actual overhead divided by estimated use of cost drivers.
   d. estimated overhead divided by estimated use of cost drivers.


60. Use of activity-based costing will result in the development of
   a. one overhead rate based on direct labor hours.
   b. one plantwide activity-based overhead rate.
   c. multiple activity-based overhead rates.
   d. no overhead rates; overhead rates are not used in activity-based costing.


61. To use activity-based costing, it is necessary to know the
   a. cost driver for each activity cost pool.
   b. expected use of cost drivers per activity.
   c. expected use of cost drivers per product.
   d. all of the above.


62. To assign overhead costs to each product, the company
   a. multiplies the activity-based overhead rates per cost driver by the number of cost drivers expected to be used per product.
   b. multiplies the overhead rate by the number of direct labor hours used on each product.
   c. assigns the cost of each activity cost pool in total to one product line.
   d. multiplies the rate of cost drivers per estimated cost for the cost pool by the estimated cost for each cost pool.

As compared to a low-volume product, a high-volume product
a. usually requires less special handling.
b. is usually responsible for more overhead costs per unit.
c. requires relatively more machine setups.
d. requires use of direct labor hours as the primary cost driver to ensure proper allocation of overhead.


Assigning overhead using ABC will usually
a. decrease the cost per unit for low volume products as compared to a traditional overhead allocation.
b. increase the cost per unit for low volume products as compared to a traditional overhead allocation.
c. provide less accurate cost per unit for low volume products than will traditional costing.
d. result in the same cost per unit for low volume products as does traditional costing.


Companies that switch to ABC often find they have
a. been overpricing some products.
b. possibly losing market share to competitors.
c. been sacrificing profitability by underpricing some products.
d. All of these answers are correct.


As compared to high-volume products, low-volume products
a. require more special handling.
b. require less machine setups.
c. are frequently responsible for less overhead costs.
d. None of these answers are correct.


For its inspecting cost pool, Ellsworth, Inc. expected overhead cost of $400,000 and 4,000 inspections. The actual overhead cost for that cost pool was $480,000 for 5,000 inspections. The activity-based overhead rate used to assign the costs of the inspecting cost pool to products is
a. $80 per inspection.
b. $96 per inspection.
c. $100 per inspection.
d. $120 per inspection.

68. Boswell Company manufactures two products, Regular and Supreme. Boswell’s overhead costs consist of machining, $3,000,000; and assembling, $1,500,000. Information on the two products is:

<table>
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<tr>
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</tr>
<tr>
<td>Number of parts</td>
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<td>160,000</td>
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Overhead applied to Regular using traditional costing using direct labor hours is
a. $1,290,000.
b. $1,800,000.
c. $2,700,000.
d. $3,210,000.


69. Boswell Company manufactures two products, Regular and Supreme. Boswell's overhead costs consist of machining, $3,000,000; and assembling, $1,500,000. Information on the two products is:

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Overhead applied to Supreme using traditional costing using direct labor hours is
a. $1,290,000.
b. $1,800,000.
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d. $3,210,000.


70. Boswell Company manufactures two products, Regular and Supreme. Boswell’s overhead costs consist of machining, $3,000,000; and assembling, $1,500,000. Information on the two products is:

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Overhead applied to Regular using activity-based costing is
a. $1,290,000.
b. $1,800,000.
c. $2,700,000.
d. $3,210,000.

71. Boswell Company manufactures two products, Regular and Supreme. Boswell’s overhead costs consist of machining, $3,000,000; and assembling, $1,500,000. Information on the two products is:

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Overhead applied to Supreme using activity-based costing is
a. $1,290,000.
b. $1,800,000.
c. $2,700,000.
d. $3,210,000.


72. Peters, Inc. produces 3 products: P1, Q2, and R3. P1 requires 400 purchase orders, Q2 requires 600 purchase orders, and R3 requires 1,000 purchase orders. Peters has identified an ordering and receiving activity cost pool with allocated overhead of $240,000 for which the cost driver is purchase orders. Direct labor hours used on each product are 50,000 for P1, 40,000 for Q2, and 110,000 for R3. How much ordering and receiving overhead is assigned to each product?

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>Q2</th>
<th>R3</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>$80,000</td>
<td>$80,000</td>
<td>$80,000</td>
</tr>
<tr>
<td>b.</td>
<td>$60,000</td>
<td>$48,000</td>
<td>$132,000</td>
</tr>
<tr>
<td>c.</td>
<td>$48,000</td>
<td>$72,000</td>
<td>$120,000</td>
</tr>
<tr>
<td>d.</td>
<td>$54,000</td>
<td>$60,000</td>
<td>$126,000</td>
</tr>
</tbody>
</table>


73. Kiner Co. computed an overhead rate for machining costs ($500,000) of $5 per machine hour. Machining costs are driven by machine hours. If computed based on direct labor hours, the overhead rate for machining costs would be $10 per direct labor hour. The company produces two products, Cape and Chap. Cape requires 60,000 machine hours and 20,000 direct labor hours, while Chap requires 40,000 machine hours and 30,000 direct labor hours. Using activity-based costing, machining costs assigned to each product is

<table>
<thead>
<tr>
<th></th>
<th>Cape</th>
<th>Chap</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>$200,000</td>
<td>$300,000</td>
</tr>
<tr>
<td>b.</td>
<td>$750,000</td>
<td>$250,000</td>
</tr>
<tr>
<td>c.</td>
<td>$266,667</td>
<td>$233,333</td>
</tr>
<tr>
<td>d.</td>
<td>$300,000</td>
<td>$200,000</td>
</tr>
</tbody>
</table>

74. Noland Company manufactures two models of its banjo, the Basic and the Luxury. The Basic model requires 10,000 direct labor hours and the Luxury requires 30,000 direct labor hours. The company produces 3,400 units of the Basic model and 600 units of the Luxury model each year. The company inspects one Basic for every 100 produced, and inspects one Luxury for every 10 produced. The company expects to incur $112,800 of total inspecting costs this year. How much of the inspecting costs should be allocated to the Basic model using ABC costing?
   a. $28,200
   b. $40,800
   c. $56,400
   d. $95,880


75. Ben Gordon, Inc. manufactures 2 products, wheels and seats. The company has estimated its overhead in the assembling department to be $660,000. The company produces 300,000 wheels and 600,000 seats each year. Each wheel uses 2 parts, and each seat uses 3 parts. How much of the assembly overhead should be allocated to wheels?
   a. $165,000.
   b. $220,000.
   c. $264,000.
   d. $282,856.


76. Windsor Co. incurs $1,050,000 of overhead costs each year in its three main departments, machining ($600,000), inspections ($300,000) and packing ($150,000). The machining department works 4,000 hours per year, there are 600 inspections per year, and the packing department packs 1,000 orders per year. Information about Windsor’s two products is as follows:

<table>
<thead>
<tr>
<th></th>
<th>Product X</th>
<th>Product Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machining hours</td>
<td>1,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Inspections</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Orders packed</td>
<td>350</td>
<td>650</td>
</tr>
<tr>
<td>Direct labor hours</td>
<td>1,700</td>
<td>1,800</td>
</tr>
</tbody>
</table>

If traditional costing based on direct labor hours is used, how much overhead is assigned to Product X this year?
   a. $252,501
   b. $363,462
   c. $510,000
   d. $525,000

77. Windsor Co. incurs $1,050,000 of overhead costs each year in its three main departments, machining ($600,000), inspections ($300,000) and packing ($150,000). The machining department works 4,000 hours per year, there are 600 inspections per year, and the packing department packs 1,000 orders per year. Information about Windsor’s two products is as follows:

<table>
<thead>
<tr>
<th></th>
<th>Product X</th>
<th>Product Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machining hours</td>
<td>1,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Inspections</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Orders packed</td>
<td>350</td>
<td>650</td>
</tr>
<tr>
<td>Direct labor</td>
<td>1,700</td>
<td>1,800</td>
</tr>
</tbody>
</table>

Using ABC, how much overhead is assigned to Product X this year?

- $252,500
- $363,462
- $510,000
- $525,000


78. A company incurs $4,050,000 of overhead each year in three departments: Ordering and Receiving, Mixing, and Testing. The company prepares 2,000 purchase orders, works 50,000 mixing hours, and performs 1,500 tests per year in producing 200,000 drums of Goo and 600,000 drums of Slime. The following data are available:

<table>
<thead>
<tr>
<th>Department</th>
<th>Expected use of Driver</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering and Receiving</td>
<td>2,000</td>
<td>$1,200,000</td>
</tr>
<tr>
<td>Mixing</td>
<td>50,000</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Testing</td>
<td>1,500</td>
<td>$1,350,000</td>
</tr>
</tbody>
</table>

Production information for Goo is as follows:

<table>
<thead>
<tr>
<th>Department</th>
<th>Expected use of Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering and Receiving</td>
<td>400</td>
</tr>
<tr>
<td>Mixing</td>
<td>20,000</td>
</tr>
<tr>
<td>Testing</td>
<td>500</td>
</tr>
</tbody>
</table>

Compute the amount of overhead assigned to Goo.

- $1,012,500
- $1,290,000
- $1,582,146
- $2,025,000

A company incurs $4,050,000 of overhead each year in three departments: Ordering and Receiving, Mixing, and Testing. The company prepares 2,000 purchase orders, works 50,000 mixing hours, and performs 1,500 tests per year in producing 200,000 drums of Goo and 600,000 drums of Slime. The following data are available:

<table>
<thead>
<tr>
<th>Department</th>
<th>Expected use of Driver</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering and Receiving</td>
<td>2,000</td>
<td>$1,200,000</td>
</tr>
<tr>
<td>Mixing</td>
<td>50,000</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Testing</td>
<td>1,500</td>
<td>1,350,000</td>
</tr>
</tbody>
</table>

Production information for Slime is as follows:

<table>
<thead>
<tr>
<th>Department</th>
<th>Expected use of Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering and Receiving</td>
<td>1,600</td>
</tr>
<tr>
<td>Mixing</td>
<td>30,000</td>
</tr>
<tr>
<td>Testing</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Compute the amount of overhead assigned to Slime.

a. $2,025,000  
b. $2,467,851  
c. $2,760,000  
d. $3,037,500


One of Stine Company's activity cost pools is machine setups, with estimated overhead of $360,000. Stine produces sparklers (400 setups) and lighters (600 setups). How much of the machine setup cost pool should be assigned to sparklers?

a. $360,000  
b. $144,000  
c. $180,000  
d. $216,000

81. Which would be an appropriate cost driver for the ordering and receiving activity cost pool?  
   a. Machine setups  
   b. Purchase orders  
   c. Machine hours  
   d. Inspections  


82. As compared to a high-volume product, a low-volume product  
   a. usually requires less special handling.  
   b. is usually responsible for more overhead costs per unit.  
   c. requires relatively fewer machine setups.  
   d. requires use of direct labor hours as the primary cost driver to ensure proper allocation of overhead.  


83. Identifying and classifying activities is the  
   a. last step under ABC.  
   b. first step under ABC.  
   c. second step under ABC.  
   d. None of these answers is correct.  


84. Zimmerman Company manufactures two products, Board 12 and Case 165. Zimmerman’s overhead costs consist of setting up machines, $2,400,000; machining, $5,400,000; and inspecting, $1,800,000. Information on the two products is:  

<table>
<thead>
<tr>
<th></th>
<th>Board 12</th>
<th>Case 165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor hours</td>
<td>15,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Machine setups</td>
<td>600</td>
<td>400</td>
</tr>
<tr>
<td>Machine hours</td>
<td>24,000</td>
<td>26,000</td>
</tr>
<tr>
<td>Inspections</td>
<td>800</td>
<td>700</td>
</tr>
</tbody>
</table>

   Overhead applied to Board 12 using traditional costing using direct labor hours is  
   a. $3,600,000.  
   b. $4,608,000.  
   c. $5,010,000.  
   d. $5,760,000.  


85. Zimmerman Company manufactures two products, Board 12 and Case 165. Zimmerman’s overhead costs consist of setting up machines, $2,400,000; machining, $5,400,000; and inspecting, $1,800,000. Information on the two products is:  

<table>
<thead>
<tr>
<th></th>
<th>Board 12</th>
<th>Case 165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor hours</td>
<td>15,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Machine setups</td>
<td>600</td>
<td>400</td>
</tr>
<tr>
<td>Machine hours</td>
<td>24,000</td>
<td>26,000</td>
</tr>
<tr>
<td>Inspections</td>
<td>800</td>
<td>700</td>
</tr>
</tbody>
</table>
MC 85. (Cont.)

Overhead applied to Case 165 using traditional costing using direct labor hours is
a. $3,840,000.
b. $4,608,000.
c. $5,010,000.
d. $6,000,000.


86. Zimmerman Company manufactures two products, Board 12 and Case 165. Zimmerman’s overhead costs consist of setting up machines, $2,400,000; machining, $5,400,000; and inspecting, $1,800,000. Information on the two products is:

<table>
<thead>
<tr>
<th></th>
<th>Board 12</th>
<th>Case 165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor hours</td>
<td>15,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Machine setups</td>
<td>600</td>
<td>400</td>
</tr>
<tr>
<td>Machine hours</td>
<td>24,000</td>
<td>26,000</td>
</tr>
<tr>
<td>Inspections</td>
<td>800</td>
<td>700</td>
</tr>
</tbody>
</table>

Overhead applied to Board 12 using activity-based costing is
a. $3,600,000.
b. $4,608,000.
c. $4,992,000.
d. $5,760,000.


87. Zimmerman Company manufactures two products, Board 12 and Case 165. Zimmerman’s overhead costs consist of setting up machines, $2,400,000; machining, $5,400,000; and inspecting, $1,800,000. Information on the two products is:

<table>
<thead>
<tr>
<th></th>
<th>Board 12</th>
<th>Case 165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor hours</td>
<td>15,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Machine setups</td>
<td>600</td>
<td>400</td>
</tr>
<tr>
<td>Machine hours</td>
<td>24,000</td>
<td>26,000</td>
</tr>
<tr>
<td>Inspections</td>
<td>800</td>
<td>700</td>
</tr>
</tbody>
</table>

Overhead applied to Case 165 using activity-based costing is
a. $3,840,000.
b. $4,608,000.
c. $4,992,000.
d. $6,000,000.

88. Thomsen Computer Company produces three products: Earth, Wind, and Fire. Earth requires 80 machine setups, Wind requires 60 setups, and Fire requires 180 setups. Thomsen has identified an activity cost pool with allocated overhead of $960,000 for which the cost driver is machine setups. How much overhead is assigned to each product?

<table>
<thead>
<tr>
<th></th>
<th>Earth</th>
<th>Wind</th>
<th>Fire</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>$320,000</td>
<td>$320,000</td>
<td>$320,000</td>
</tr>
<tr>
<td>b.</td>
<td>$200,000</td>
<td>$150,000</td>
<td>$450,000</td>
</tr>
<tr>
<td>c.</td>
<td>$240,000</td>
<td>$180,000</td>
<td>$540,000</td>
</tr>
<tr>
<td>d.</td>
<td>$180,000</td>
<td>$320,000</td>
<td>$460,000</td>
</tr>
</tbody>
</table>

Ans: c, LO: 2

89. Hale Company manufactures two models of its couch, the Mini and the Maxi. The Mini model requires 10,000 direct labor hours and the Maxi model requires 40,000 direct labor hours. The company produces 4,000 units of the Mini model and 1,000 units of the Maxi model each year. The company produces the Mini model in batch sizes of 200, while it produces the Maxi model in batch sizes of 100. The company expects to incur $360,000 of total setup costs this year. How much of the setup costs are allocated to the Mini model using ABC costing?

a. $240,000
b. $180,000
c. $72,000
d. $300,000

Ans: a, LO: 2

90. Nott Company manufactures two products, pillows and comforters. The company has estimated its overhead in the order-processing department to be $600,000. The company produces 50,000 pillows and 80,000 comforters each year. Pillow production requires 25,000 machine hours, comforter production requires 50,000 machine hours. The company places raw materials orders 10 times per month, 2 times for raw materials for pillows and the remainder for raw materials for comforters. How much of the order processing overhead should be allocated to comforters?

a. $300,000
b. $400,000
c. $369,232
d. $480,000

Ans: d, LO: 2

91. Foxx Company incurs $480,000 overhead costs each year in its three main departments, setup ($30,000), machining ($330,000), and packing ($120,000). The setup department performs 40 setups per year, the machining department works 5,000 hours per year, and the packing department packs 500 orders per year. Information about Foxx’s two products is as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>A1</th>
<th>B1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of setups</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Machining hours</td>
<td>1,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Orders packed</td>
<td>150</td>
<td>350</td>
</tr>
<tr>
<td>Number of products manufactured</td>
<td>600</td>
<td>400</td>
</tr>
</tbody>
</table>
MC 91. (Cont.)

If machining hours are used as a base under traditional casting, how much overhead is assigned to Product A1 each year?

a. $96,000
b. $240,000
c. $165,000
d. $144,000


92. Foxx Company incurs $480,000 overhead costs each year in its three main departments, setup ($30,000), machining ($330,000), and packing ($120,000). The setup department performs 40 setups per year, the machining department works 5,000 hours per year, and the packing department packs 500 orders per year. Information about Foxx’s two products is as follows:

<table>
<thead>
<tr>
<th>Product A1</th>
<th>Product B1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of setups</td>
<td>20</td>
</tr>
<tr>
<td>Machining hours</td>
<td>1,000</td>
</tr>
<tr>
<td>Orders packed</td>
<td>150</td>
</tr>
<tr>
<td>Number of products manufactured</td>
<td>600</td>
</tr>
</tbody>
</table>

Using ABC, how much overhead is assigned to Product A1 each year?

a. $240,000
b. $363,000
c. $ 96,000
d. $117,000


93. Foxx Company incurs $480,000 overhead costs each year in its three main departments, setup ($30,000), machining ($330,000), and packing ($120,000). The setup department performs 40 setups per year, the machining department works 5,000 hours per year, and the packing department packs 500 orders per year. Information about Foxx’s two products is as follows:

<table>
<thead>
<tr>
<th>Product A1</th>
<th>Product B1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of setups</td>
<td>20</td>
</tr>
<tr>
<td>Machining hours</td>
<td>1,000</td>
</tr>
<tr>
<td>Orders packed</td>
<td>150</td>
</tr>
<tr>
<td>Number of products manufactured</td>
<td>600</td>
</tr>
</tbody>
</table>

Using ABC, how much overhead is assigned to Product B1 each year?

a. $240,000
b. $192,000
c. $363,000
d. $384,000

A company incurs $3,600,000 of overhead each year in three departments: Processing, Packaging, and Testing. The company performs 800 processing transactions, 200,000 packaging transactions, and 2,000 tests per year in producing 400,000 drums of Oil and 600,000 drums of Sludge. The following data are available:

<table>
<thead>
<tr>
<th>Department</th>
<th>Expected Use of Driver</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processing</td>
<td>800</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Packaging</td>
<td>200,000</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Testing</td>
<td>2,000</td>
<td>600,000</td>
</tr>
</tbody>
</table>

Production information for the two products is as follows:

<table>
<thead>
<tr>
<th>Department</th>
<th>Expected Use of Driver</th>
<th>Oil</th>
<th>Sludge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processing</td>
<td>300</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Packaging</td>
<td>120,000</td>
<td>80,000</td>
<td></td>
</tr>
<tr>
<td>Testing</td>
<td>1,600</td>
<td>400</td>
<td></td>
</tr>
</tbody>
</table>

The amount of overhead assigned to Oil using ABC is

- a. $1,800,000.
- b. $1,942,500.
- c. $1,657,500.
- d. $1,380,000.

The amount of overhead assigned to Sludge using ABC is

- a. $1,800,000.
- b. $1,657,500.
- c. $1,942,500.
- d. $1,380,000.
96. Younger, Inc. manufactures recliners for the hotel industry. It has two products, the Heater and the Massager, and total overhead is $3,160,000. The company plans to manufacture 400 Heaters and 100 Massagers this year. In manufacturing the recliners, the company must perform 600 material moves for the Heater and 400 for the Massager; it processes 900 purchase orders for the Heater and 700 for the Massager; and the company’s employees work 1,400 direct labor hours on the Heater product and 3,400 on the Massager. Younger’s total material handling costs are $2,000,000 and its total processing costs are $1,160,000. Using ABC, how much overhead would be assigned to the Heater product?
   a. $1,580,000
   b. $1,852,500
   c. $1,307,500
   d. $2,238,332


97. Which of the following is a limitation of activity-based costing?
   a. More cost pools
   b. Less control over overhead costs
   c. Poorer management decisions
   d. Some arbitrary allocations continue


98. Which of the following factors would suggest a switch to activity-based costing?
   a. Product lines similar in volume and manufacturing complexity.
   b. Overhead costs constitute a significant portion of total costs.
   c. The manufacturing process has been stable.
   d. Production managers use data provided by the existing system.


99. Which of the following is true of activity-based costing?
   a. More cost pools
   b. Same base as traditional costing
   c. Less costly to use
   d. Eliminates arbitrary allocations


100. The primary benefit of ABC is it provides
   a. better management decisions.
   b. enhanced control over overhead costs.
   c. more cost pools.
   d. more accurate product costing.


101. Which of the following is not a benefit of activity-based costing?
   a. More accurate product costing
   b. Enhanced control over overhead costs
   c. Better management decisions
   d. Less costly to use


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102. Each of the following is a limitation of activity-based costing **except** that
   a. it can be expensive to use.
   b. it is more complex than traditional costing.
   c. more cost pools are used.
   d. some arbitrary allocations continue.


103. The presence of any of the following factors would suggest a switch to ABC **except** when
   a. product lines differ greatly in volume.
   b. overhead costs constitute a minor portion of total costs.
   c. the manufacturing process has changed significantly.
   d. production managers are ignoring data provided by the existing system.


104. Which of the following is a limitation of activity-based costing?
   a. More cost pools
   b. Less control over overhead costs
   c. ABC can be expensive to use
   d. Poorer management decisions


105. Which of the following is true about activity-based costing?
   a. Less cost pools
   b. Same base as traditional costing
   c. More costly to use
   d. Eliminates arbitrary allocations


106. Each of the following is a limitation of activity-based costing **except** that
   a. it can be expensive to use.
   b. it decreases control over overhead costs
   c. it is complex and can be difficult to understand
   d. some arbitrary allocations continue.


107. The presence of any of the following factors would suggest a switch to ABC **except** when
   a. product lines differ greatly in volume.
   b. overhead costs constitute a major portion of total costs.
   c. the manufacturing process has changed significantly.
   d. production managers are using data provided by the existing system


108. Activity-based costing uses
   a. one plantwide pool and a single cost driver.
   b. departmental pools and a single cost driver.
   c. numerous cost pools and numerous cost drivers.
   d. one plantwide pool and numerous cost drivers

109. Which of the following statements is false?
   a. ABC can weaken control over overhead costs.
   b. Under ABC, companies can trace many overhead costs directly to activities.
   c. ABC allows some indirect costs to be identified as direct costs.
   d. managers become more aware of their responsibility to control the activities that generate costs.


110. Which of the following is a value-added activity?
   a. Inventory storage
   b. Machining
   c. Building maintenance
   d. Bookkeeping


111. Which of the following is a value-added activity?
   a. Inventory control
   b. Inspections
   c. Packaging
   d. Repair of machines


112. Which of the following is a non-value-added activity?
   a. Inventory control
   b. Machining
   c. Assembly
   d. Painting


113. Which of the following is a non-value-added activity?
   a. Painting
   b. Finishing
   c. Packaging
   d. Building maintenance


114. A non-value-added activity in a service enterprise is
   a. providing legal research.
   b. delivering packages.
   c. consulting.
   d. bookkeeping.

115. A value-added activity in a service enterprise is
   a. performing landscaping services.
   b. reception.
   c. billing.
   d. ordering supplies.


116. Non-value-added activities
   a. should be minimized or eliminated.
   b. involve those activities that are essential to a company’s operations.
   c. increase both the cost and perceived value of a product.
   d. cannot be differentiated from value-added activities.


117. Value-added activities
   a. increase the perceived worth of a product or service to customers.
   b. involve those activities that are essential to a company’s operations.
   c. include engineering design, machining, and assembly.
   d. all of the above.


118. Which of the following is a value-added activity?
   a. Engineering design
   b. Machinery repair
   c. Inventory storage
   d. Inspections


119. Which of the following is a non-value-added activity?
   a. Engineering design
   b. Machining
   c. Inspection
   d. Packaging


120. A non-value-added activity in a service enterprise is
   a. taking appointments.
   b. traveling.
   c. advertising.
   d. all of these.


121. Value-added activities
   a. should be minimized or eliminated.
   b. involve those activities that are essential to a company’s operations.
   c. add cost to a product without affecting selling price.
   d. cannot be differentiated from non-value-added activities.

122. All of the following are examples of a value-added activity in a service company except
   a. delivering packages by a delivery service.
   b. ordering supplies.
   c. performing surgery.
   d. providing legal research for legal services.


123. Which of the following is not a facility-level activity?
   a. Plant management
   b. Product design
   c. Personnel administration
   d. Training


124. Which of the following is not a product-level activity?
   a. Product design
   b. Engineering changes
   c. Inventory management
   d. Equipment setups


125. Which of the following is not a batch-level activity?
   a. Engineering changes
   b. Equipment setups
   c. Inspection
   d. Materials handling


126. Which of the following is not a unit-level activity?
   a. Purchase ordering
   b. Assembling
   c. Painting
   d. Sewing


127. Which of the following is a batch-level activity?
   a. Plant management
   b. Product design
   c. Equipment setups
   d. Assembling


128. Which of the following is not a facility-level activity?
   a. Plant depreciation
   b. Property taxes
   c. Engineering changes
   d. Utilities

129. Which of the following is **not** a product-level activity?
   a. Product design
   b. Engineering changes
   c. Material handling
   d. Inventory management


130. Which of the following is **not** a batch-level activity?
   a. Purchase ordering
   b. Equipment setups
   c. Inspection
   d. Assembling


131. Which of the following is **not** a unit-level activity?
   a. Drilling
   b. Cutting
   c. Sanding
   d. Inspecting


132. Which of the following is a unit-level activity?
   a. Painting
   b. Purchase ordering
   c. Inspection
   d. Material handling


133. Which of the following is a batch-level activity?
   a. Assembling
   b. Product design
   c. Engineering changes
   d. Purchase ordering


134. Which of the following is a product-level activity?
   a. Equipment setups
   b. Product design
   c. Property taxes
   d. Utilities


135. Which of the following is a facility-level activity?
   a. Engineering changes
   b. Product design
   c. Property taxes
   d. Inspection

136. Activities required to support or sustain an entire production process are called
   a. unit-level activities.
   b. batch-level activities.
   c. product-level activities.
   d. facility-level activities.


137. Which would be a cost driver for a facility-level activity?
   a. Number of setups
   b. Number of product designs
   c. Square footage
   d. Number of purchase orders


138. Activity-based costing has been found to be useful in each of the following service industries except
   a. airlines.
   b. railroads.
   c. hotels.
   d. ABC has been useful in all of these industries.


139. Activity-based costing is used in
   
   **Service industries** | **Manufacturing industries**
   a. Yes | No
   b. Yes | Yes
   c. No | Yes
   d. No | No


140. In service industries
   a. activities cannot be labeled as value-added or non-value-added.
   b. the overall objective of ABC is different than in manufacturing industries.
   c. a larger proportion of overhead costs are company-wide costs.
   d. activity cost pools cannot be identified.


141. Activity-based costing is used by
   a. accounting firms.
   b. law firms.
   c. consulting firms.
   d. all of the above.

142. Baxter Accounting Services estimates for next year revenues of $3,000,000, direct labor of $600,000, and overhead of $1,050,000. Under traditional costing, overhead is applied to audit jobs using the rate of
a. 35% of revenues.
b. 20% of revenues.
c. 56% of direct labor.
d. 175% of direct labor.


143. Gant Accounting performs two types of services, Audit and Tax. Gant’s overhead costs consist of computer support, $300,000; and legal support, $150,000. Information on the two services is:

<table>
<thead>
<tr>
<th></th>
<th>Audit</th>
<th>Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor cost</td>
<td>$50,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>CPU minutes</td>
<td>40,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Legal hours used</td>
<td>200</td>
<td>800</td>
</tr>
</tbody>
</table>

Overhead applied to audit services using traditional costing is
a. $150,000.
b. $180,000.
c. $270,000.
d. $300,000.


144. Gant Accounting performs two types of services, Audit and Tax. Gant’s overhead costs consist of computer support, $300,000; and legal support, $150,000. Information on the two services is:

<table>
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</tr>
<tr>
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<td>200</td>
<td>800</td>
</tr>
</tbody>
</table>

Overhead applied to tax services using traditional costing is
a. $150,000.
b. $180,000.
c. $270,000.
d. $300,000.


145. Gant Accounting performs two types of services, Audit and Tax. Gant’s overhead costs consist of computer support, $300,000; and legal support, $150,000. Information on the two services is:

<table>
<thead>
<tr>
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</thead>
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<tr>
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<td>10,000</td>
</tr>
<tr>
<td>Legal hours used</td>
<td>200</td>
<td>800</td>
</tr>
</tbody>
</table>
MC 145. (Cont.)

Overhead applied to audit services using activity-based costing is
a. $150,000.
b. $180,000.
c. $270,000.
d. $300,000.


146. Gant Accounting performs two types of services, Audit and Tax. Gant’s overhead costs consist of computer support, $300,000; and legal support, $150,000. Information on the two services is:

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<td>10,000</td>
</tr>
<tr>
<td>Legal hours used</td>
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<td>800</td>
</tr>
</tbody>
</table>

Overhead applied to tax services using activity-based costing is
a. $150,000.
b. $180,000.
c. $270,000.
d. $300,000.


147. Gant Accounting performs two types of services, Audit and Tax. Gant’s overhead costs consist of computer support, $300,000; and legal support, $150,000. Information on the two services is:

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<th>Tax</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
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<td>10,000</td>
</tr>
<tr>
<td>Legal hours used</td>
<td>200</td>
<td>800</td>
</tr>
</tbody>
</table>

Gant Accounting performs tax services for Cathy Lane. Direct labor cost is $1,200; 600 CPU minutes were used; and 1 legal hour was used. What is the total cost of the Lane job using activity-based costing?

<table>
<thead>
<tr>
<th></th>
<th>Audit</th>
<th>Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor cost</td>
<td>$1,200</td>
<td>$1,200</td>
</tr>
<tr>
<td>CPU minutes</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>Legal hours used</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

a. $3,600
b. $3,750
c. $5,400
d. $4,950


148. Activity-based costing has been found to be useful in each of the following service industries except
a. banks.
b. hospitals.
c. telephone companies.
d. ABC has been useful in any of these industries.


FOR INSTRUCTOR USE ONLY
149. What sometimes makes implementation of activity-based costing difficult in service industries is
a. the labeling of activities as value-added.
b. identifying activities, activity cost plus, and cost drivers.
c. that a larger proportion of overhead costs are company-wide costs.
d. attempting to reduce or eliminate non-value-added activities.


150. All of the following statements are correct except that
a. activity-based costing has been widely adopted in service industries.
b. the objective of installing ABC in service firms is different than it is in a manufacturing firm.
c. a larger proportion of overhead costs are company-wide costs in service industries.
d. the general approach to identifying activities and activity cost pools is the same in a service company as in a manufacturing company.


151. The use of activity-based costing in service industries
a. has the same objective as in manufacturing.
b. results in improved costing of services provided.
c. uses cost pools to assign overhead.
d. all of these.


*152. Just-in-time processing
a. is based on a just-in-case philosophy.
b. results in a push approach.
c. minimizes inventory storage and waiting time.
d. all of these.


*153. An element of just-in-time processing is
a. dependable suppliers who are willing to deliver on short notice.
b. a multi-skilled workforce.
c. a total quality control system.
d. all of these.


*154. Which of the following is not a benefit of just-in-time processing?
 a. Control of significant inventory balances
 b. Enhanced product quality
 c. Reduction of rework costs
d. Production cost savings

155. Which account is used in just-in-time processing?
   a. Raw Materials Inventory  
   b. Work-in-Process Inventory  
   c. Merchandise Inventory  
   d. Raw and In-Process Inventory


156. Under just-in-time processing, all of the following are received or completed “just in time” except
   a. finished goods.  
   b. raw materials.  
   c. subassembly parts.  
   d. supplies.


157. Just-in-time processing
   a. is based on a just-in-case philosophy.  
   b. results in higher inventory amounts.  
   c. eliminates the push approach.  
   d. all of the above.


158. Just-in-time processing
   a. results in the opposite of a just-in-case philosophy.  
   b. results in a pull approach.  
   c. minimizes inventory storage and waiting time.  
   d. all of the above.


159. An important element of just-in-time processing is
   a. dependable suppliers who are willing to deliver on short notice.  
   b. a specialized workforce.  
   c. less emphasis on a quality control system.  
   d. all of the above.


160. Which of the following is a limitation of just-in-time processing?
   a. Significant reduction of manufacturing inventories  
   b. Less emphasis on product quality  
   c. Higher production costs  
   d. None of the above

4.161. Which account is not used in just-in-time processing?
   a. Accounts Payable
   b. Work-in-Process Inventory
   c. Finished Goods Inventory
   d. Raw and In-Process Inventory


4.162. In the pull approach
   a. subassembly parts are manufactured and stored just in case they are needed later in the manufacturing process.
   b. Finished goods are completed and stored just in case unexpected and rush customer orders are received.
   c. the manufacturing process begins with a customer placing an order.
   d. None of the above.


Answers to Multiple Choice Questions

<table>
<thead>
<tr>
<th></th>
<th></th>
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<td>c</td>
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<td>c</td>
<td>88.</td>
<td>c</td>
<td>107.</td>
<td>d</td>
<td>126.</td>
<td>a</td>
<td>145.</td>
<td>c</td>
</tr>
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<td>c</td>
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<td>d</td>
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<td>c</td>
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<td>c</td>
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<td>c</td>
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<td>b</td>
<td>73.</td>
<td>d</td>
<td>92.</td>
<td>d</td>
<td>111.</td>
<td>c</td>
<td>130.</td>
<td>d</td>
<td>149.</td>
<td>c</td>
</tr>
<tr>
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<td>c</td>
<td>55.</td>
<td>b</td>
<td>74.</td>
<td>b</td>
<td>93.</td>
<td>c</td>
<td>112.</td>
<td>a</td>
<td>131.</td>
<td>d</td>
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<td>b</td>
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<tr>
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<td>a</td>
<td>75.</td>
<td>a</td>
<td>94.</td>
<td>b</td>
<td>113.</td>
<td>d</td>
<td>132.</td>
<td>a</td>
<td>151.</td>
<td>d</td>
</tr>
<tr>
<td>38.</td>
<td>d</td>
<td>57.</td>
<td>c</td>
<td>76.</td>
<td>c</td>
<td>95.</td>
<td>b</td>
<td>114.</td>
<td>d</td>
<td>133.</td>
<td>d</td>
<td>152.</td>
<td>c</td>
</tr>
<tr>
<td>39.</td>
<td>d</td>
<td>58.</td>
<td>b</td>
<td>77.</td>
<td>a</td>
<td>96.</td>
<td>b</td>
<td>115.</td>
<td>a</td>
<td>134.</td>
<td>b</td>
<td>153.</td>
<td>d</td>
</tr>
<tr>
<td>40.</td>
<td>a</td>
<td>59.</td>
<td>d</td>
<td>78.</td>
<td>b</td>
<td>97.</td>
<td>d</td>
<td>116.</td>
<td>a</td>
<td>135.</td>
<td>c</td>
<td>154.</td>
<td>a</td>
</tr>
<tr>
<td>41.</td>
<td>b</td>
<td>60.</td>
<td>c</td>
<td>79.</td>
<td>c</td>
<td>98.</td>
<td>b</td>
<td>117.</td>
<td>d</td>
<td>136.</td>
<td>d</td>
<td>155.</td>
<td>d</td>
</tr>
<tr>
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<td>61.</td>
<td>d</td>
<td>80.</td>
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<td>99.</td>
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<td>118.</td>
<td>a</td>
<td>137.</td>
<td>c</td>
<td>156.</td>
<td>d</td>
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<td>c</td>
<td>62.</td>
<td>a</td>
<td>81.</td>
<td>b</td>
<td>100.</td>
<td>d</td>
<td>119.</td>
<td>c</td>
<td>138.</td>
<td>d</td>
<td>157.</td>
<td>c</td>
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<td>82.</td>
<td>b</td>
<td>101.</td>
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<td>120.</td>
<td>d</td>
<td>139.</td>
<td>b</td>
<td>158.</td>
<td>d</td>
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<tr>
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<td>b</td>
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<td>b</td>
<td>83.</td>
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<td>102.</td>
<td>c</td>
<td>121.</td>
<td>b</td>
<td>140.</td>
<td>c</td>
<td>159.</td>
<td>a</td>
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<td>d</td>
<td>65.</td>
<td>d</td>
<td>84.</td>
<td>a</td>
<td>103.</td>
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<td>122.</td>
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<td>141.</td>
<td>d</td>
<td>160.</td>
<td>d</td>
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<tr>
<td>47.</td>
<td>d</td>
<td>66.</td>
<td>a</td>
<td>85.</td>
<td>d</td>
<td>104.</td>
<td>c</td>
<td>123.</td>
<td>b</td>
<td>142.</td>
<td>d</td>
<td>161.</td>
<td>b</td>
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<td>67.</td>
<td>c</td>
<td>86.</td>
<td>c</td>
<td>105.</td>
<td>c</td>
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<td>d</td>
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<td>162.</td>
<td>c</td>
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<td>49.</td>
<td>a</td>
<td>68.</td>
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<td>87.</td>
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<td>a</td>
<td>144.</td>
<td>d</td>
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</tbody>
</table>
BRIEF EXERCISES

BE 163

Speedy Access Services Inc. leases access to high-speed computers to small businesses. It provides the following information for the year:

<table>
<thead>
<tr>
<th></th>
<th>Budgeted</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overhead cost</td>
<td>$2,200,000</td>
<td>$2,100,000</td>
</tr>
<tr>
<td>Computer hours</td>
<td>100,000</td>
<td>90,000</td>
</tr>
<tr>
<td>Direct labor hours</td>
<td>200,000</td>
<td>180,000</td>
</tr>
</tbody>
</table>

Overhead is applied on the basis of computer hours.

Instructions
a. Compute the predetermined overhead rate.
b. Determine the amount of overhead applied for the year.


Solution 163 (5 min.)
a. $2,200,000 ÷ 100,000 = $22 per computer hour.
b. 90,000 computer hours X $22 per computer hour = $1,980,000 overhead applied

BE 164

Bark Manufacturing has three activities in its manufacturing process: machine setups, machining, and inspections. Estimated annual overhead cost for each activity is $80,000, $162,500, and $28,000, respectively. The expected annual use in each department is 1,000 setups, 12,500 machine hours, and 875 inspections.

Instructions
Compute the overhead rate for each activity.


Solution 164 (5 min.)
Machine setups $80,000 ÷ 1,000 = $80 per setup
Machining $162,500 ÷ 12,500 = $13 per machine hour
Inspections $28,000 ÷ 875 = $32 per inspection

BE 165

Fine Industries uses activity-based costing to assist management in setting prices for the company’s three major product lines. The following information is available:

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Estimated Overhead</th>
<th>Expected Use of Cost Driver per Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutting</td>
<td>$900,000</td>
<td>25,000 labor hours</td>
</tr>
<tr>
<td>Stitching</td>
<td>8,000,000</td>
<td>320,000 machine hours</td>
</tr>
<tr>
<td>Inspections</td>
<td>2,800,000</td>
<td>160,000 labor hours</td>
</tr>
<tr>
<td>Packing</td>
<td>800,000</td>
<td>64,000 finished goods units</td>
</tr>
</tbody>
</table>
BE 165.  (Cont.)

Instructions
Compute the activity-based overhead rates.


Solution 165  (5 min.)

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Estimated Overhead</th>
<th>Expected Use of Cost Driver per Activity</th>
<th>Activity-Based Overhead Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutting</td>
<td>$900,000</td>
<td>25,000 labor hours</td>
<td>$36.00 per labor hour</td>
</tr>
<tr>
<td>Stitching</td>
<td>8,000,000</td>
<td>320,000 machine hours</td>
<td>$25.00 per machine hour</td>
</tr>
<tr>
<td>Inspections</td>
<td>2,800,000</td>
<td>160,000 labor hours</td>
<td>$17.50 per labor hour</td>
</tr>
<tr>
<td>Packing</td>
<td>800,000</td>
<td>64,000 finished units</td>
<td>$12.50 per finished unit</td>
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</tbody>
</table>

BE 166

Tunes & More, Inc. manufactures speakers and receivers and uses activity-based costing. The following information is available:

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Estimated Overhead</th>
<th>Expected Use of Cost Driver per Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering</td>
<td>$168,000</td>
<td>24,000 orders</td>
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<tr>
<td>Soldering</td>
<td>192,000</td>
<td>64,000 machine hours</td>
</tr>
<tr>
<td>Inspecting</td>
<td>900,000</td>
<td>120,000 labor hours</td>
</tr>
<tr>
<td>Packing</td>
<td>840,000</td>
<td>56,000 boxes</td>
</tr>
</tbody>
</table>

Instructions
Compute the activity-based overhead rates.


Solution 166  (5 min.)

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Estimated Overhead</th>
<th>Expected Use of Cost Driver per Activity</th>
<th>Activity-Based Overhead Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering</td>
<td>$168,000</td>
<td>24,000 orders</td>
<td>$7.00 per order</td>
</tr>
<tr>
<td>Soldering</td>
<td>192,000</td>
<td>64,000 machine hours</td>
<td>$3.00 per machine hour</td>
</tr>
<tr>
<td>Inspecting</td>
<td>900,000</td>
<td>120,000 labor hours</td>
<td>$7.50 per labor hour</td>
</tr>
<tr>
<td>Packing</td>
<td>840,000</td>
<td>56,000 boxes</td>
<td>$15.00 per box</td>
</tr>
</tbody>
</table>

BE 167

Eaton Tires manufactures tires for dune buggies and has two different products, nubby tires and smooth tires. The company produces 5,000 nubby tires and 10,000 smooth tires each year and incurs $172,000 of overhead costs. The following information is available:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Total Cost</th>
<th>Cost Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials handling</td>
<td>$60,000</td>
<td>Number of requisitions</td>
</tr>
<tr>
<td>Machine setups</td>
<td>55,000</td>
<td>Number of setups</td>
</tr>
<tr>
<td>Quality inspections</td>
<td>57,000</td>
<td>Number of inspections</td>
</tr>
</tbody>
</table>
BE 167  (Cont.)

For the nubby tires, the company has 400 requisitions, 200 setups, and 200 inspections. The smooth tires require 600 requisitions, 300 setups, and 400 inspections.

**Instructions**
Determine the overhead rate for each activity.


**Solution 167  (5 – 10 min.)**

The overhead rates are:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Overhead</th>
<th>Expected Use of Cost Drivers</th>
<th>Overhead Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials handling</td>
<td>$60,000</td>
<td>1,000</td>
<td>$60/req.</td>
</tr>
<tr>
<td>Machine setups</td>
<td>55,000</td>
<td>500</td>
<td>$110/setup</td>
</tr>
<tr>
<td>Quality inspections</td>
<td>57,000</td>
<td>600</td>
<td>$ 95/insp.</td>
</tr>
</tbody>
</table>

BE 168

The legal firm of West, Green, and Ink uses ABC to allocate its overhead costs. The firm has identified the following activity cost pools:

A. Direct labor fringe benefits.
B. Printing and photocopying.
C. Secretarial support.
D. Client support.
E. Recruiting and training.
F. Computer support.
G. Liability insurance

**Instructions**
Match these cost pools with the appropriate cost driver listed below.

_____ 1. Revenue billed.
_____ 2. CPU minutes.
_____ 3. Number of pages.
_____ 4. Direct labor cost.
_____ 5. Number of clients.
_____ 6. Number of recruits.
_____ 7. Direct professional hours.


**Solution 168  (3 min.)**

1. G  5. D
2. F  6. E
3. B  7. C
4. A
Greer Company provides architectural services for mall development companies. The following data are available for 2016.

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Estimated Overhead</th>
<th>Expected Use of Cost Driver per Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secretarial support</td>
<td>$ 220,000</td>
<td>25,000 professional hours</td>
</tr>
<tr>
<td>Direct labor fringe benefits</td>
<td>200,000</td>
<td>$500,000 direct labor cost</td>
</tr>
<tr>
<td>Printing and copying</td>
<td>30,000</td>
<td>20,000 pages</td>
</tr>
<tr>
<td>Computer support</td>
<td>250,000</td>
<td>50,000 minutes</td>
</tr>
<tr>
<td>Liability insurance</td>
<td>140,000</td>
<td>$2,800,000 billed revenue</td>
</tr>
</tbody>
</table>

**Instructions**
Compute the activity-based overhead rates.

**Solution 169** (4 min.)

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Estimated Overhead</th>
<th>Expected Use of Cost Driver per Activity</th>
<th>Activity-Based Overhead Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secretarial support</td>
<td>$ 220,000</td>
<td>25,000 professional hours</td>
<td>$8.80/prof. hour</td>
</tr>
<tr>
<td>Direct labor fringe benefits</td>
<td>200,000</td>
<td>$500,000 direct labor cost</td>
<td>$0.40/DL Dollar</td>
</tr>
<tr>
<td>Printing and copying</td>
<td>30,000</td>
<td>20,000 pages</td>
<td>$1.50/page</td>
</tr>
<tr>
<td>Computer support</td>
<td>250,000</td>
<td>50,000 minutes</td>
<td>$5/minute</td>
</tr>
<tr>
<td>Liability insurance</td>
<td>140,000</td>
<td>$2,800,000 billed revenue</td>
<td>$0.05/Rev. $ Billed</td>
</tr>
</tbody>
</table>

**BE 170**

Hops, Inc. manufactures several types of microbrew beers. Hops has identified the following activities:

a. Inventory control
b. Purchasing
c. Receiving
d. Employee training
e. Machine setups
f. Brewing
g. Packing and shipping

**Instructions**
Classify each activity as value-added or non-value-added.

**Solution 170** (5 min.)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Inventory control</td>
<td>Non-value-added</td>
</tr>
<tr>
<td>b. Purchasing</td>
<td>Non-value-added</td>
</tr>
<tr>
<td>c. Receiving</td>
<td>Non-value-added</td>
</tr>
<tr>
<td>d. Employee training</td>
<td>Non-value-added</td>
</tr>
<tr>
<td>e. Machine setups</td>
<td>Non-value-added</td>
</tr>
<tr>
<td>f. Brewing</td>
<td>Value-added</td>
</tr>
<tr>
<td>g. Packing and shipping</td>
<td>Value-added</td>
</tr>
</tbody>
</table>
BE 171

Milner Services is considering the installation of activity-based costing. The following activities are performed daily by staff consultants: (1) consulting with clients, (2) staff meetings, (3) on-site supervision, (4) meals, (5) entertaining prospective clients, and (6) training client personnel.

Instructions
Classify these activities as value-added or non-value-added.


Solution 171 (3 min.)

Value-Added Activities: (1) Consulting with clients, (3) On-site supervision, and (6) Training client personnel.

Non-Value-Added Activities: (2) Staff meetings, (4) Meals, and (5) Entertaining prospective clients.

EXERCISES

Ex. 172

Hayward Industries manufactures dining chairs and tables. The following information is available:

<table>
<thead>
<tr>
<th></th>
<th>Dining Chairs</th>
<th>Tables</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine setups</td>
<td>200</td>
<td>600</td>
<td>$48,000</td>
</tr>
<tr>
<td>Inspections</td>
<td>250</td>
<td>470</td>
<td>$72,000</td>
</tr>
<tr>
<td>Labor hours</td>
<td>2,600</td>
<td>2,400</td>
<td></td>
</tr>
</tbody>
</table>

Hayward is considering switching from one overhead rate based on labor hours to activity-based costing.

Instructions
Perform the following analyses for these two components of overhead:

a. Compute total machine setups and inspection costs assigned to each product, using a single overhead rate.

b. Compute total machine setups and inspection costs assigned to each product, using activity-based costing.

c. Comment on your findings.


Solution 172 (8 – 12 min.)

a. Single overhead rate

\[
\text{($48,000 + $72,000) \div 5,000 = $24 per labor hour}
\]

Dining chairs: \(2,600 \times $24 = 62,400\)
Tables: \(2,400 \times $24 = 57,600\)

\[\text{Total = $120,000}\]
b. Activity-based costing
   Machine setups: \( \frac{48,000}{800} = \$60 \) per setup
   Inspections: \( \frac{72,000}{720} = \$100 \) per inspection
   Dining chairs: \( (200 \times \$60) + (250 \times \$100) = \$37,000 \)
   Tables: \( (600 \times \$60) + (470 \times \$100) = \$83,000 \)
   \( \$120,000 \)

c. The use of activity-based costing resulted in the allocation of less cost to dining chairs and more cost to tables. The change in cost allocation reflects a more accurate allocation based on cause and effect.

Ex. 173

Randel Manufacturing has five activity cost pools and two products (a budget tape vacuum and a deluxe tape vacuum). Information is presented below:

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Cost Driver</th>
<th>Est. Overhead</th>
<th>Cost Drivers by Product</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Budget</td>
</tr>
<tr>
<td>Ordering and Receiving</td>
<td>Orders</td>
<td>$130,000</td>
<td>600</td>
</tr>
<tr>
<td>Machine Setup</td>
<td>Setups</td>
<td>297,000</td>
<td>500</td>
</tr>
<tr>
<td>Machining</td>
<td>Machine hours</td>
<td>1,000,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Assembly</td>
<td>Parts</td>
<td>1,600,000</td>
<td>1,200,000</td>
</tr>
<tr>
<td>Inspection</td>
<td>Inspections</td>
<td>300,000</td>
<td>550</td>
</tr>
</tbody>
</table>

Instructions

Compute the overhead cost per unit for each product. Production is 700,000 units of Budget and 200,000 units of Deluxe. Round your answer to the nearest cent.


Solution 173 (15 – 20 min.)

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Est. Overhead</th>
<th>Total Est. Activity</th>
<th>Overhead Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering &amp; Receiving</td>
<td>$130,000</td>
<td>1,000 orders</td>
<td>$130/order</td>
</tr>
<tr>
<td>Machine Setup</td>
<td>297,000</td>
<td>900 setups</td>
<td>$330/setup</td>
</tr>
<tr>
<td>Machining</td>
<td>1,000,000</td>
<td>250,000 mach. hours</td>
<td>$4/machine hour</td>
</tr>
<tr>
<td>Assembly</td>
<td>1,600,000</td>
<td>2,000,000 parts</td>
<td>$.80/part</td>
</tr>
<tr>
<td>Inspection</td>
<td>300,000</td>
<td>1,000 inspections</td>
<td>$300/inspection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Cost Driver</th>
<th>Rate</th>
<th>Cost Assigned</th>
<th>Cost Driver</th>
<th>Rate</th>
<th>Cost Assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering &amp; Receiving</td>
<td>600</td>
<td>$130</td>
<td>$78,000</td>
<td>400</td>
<td>$130</td>
<td>$52,000</td>
</tr>
<tr>
<td>Machine Setup</td>
<td>500</td>
<td>330</td>
<td>165,000</td>
<td>400</td>
<td>330</td>
<td>132,000</td>
</tr>
<tr>
<td>Machining</td>
<td>150,000</td>
<td>4</td>
<td>600,000</td>
<td>100,000</td>
<td>4</td>
<td>400,000</td>
</tr>
<tr>
<td>Assembly</td>
<td>1,200,000</td>
<td>.80</td>
<td>960,000</td>
<td>800,000</td>
<td>.80</td>
<td>640,000</td>
</tr>
<tr>
<td>Inspection</td>
<td>550</td>
<td>300</td>
<td>165,000</td>
<td>450</td>
<td>300</td>
<td>135,000</td>
</tr>
</tbody>
</table>

\( \frac{\$1,968,000}{700,000} = \$2.81 \) per unit
\( \frac{\$1,359,000}{200,000} = \$6.80 \) per unit
Ex. 174

Horton, Reiser, and Associates, a law firm, employs ABC. The following budgeted data for each of the activity cost pools is provided for the year 2016.

<table>
<thead>
<tr>
<th>Activity Cost Pools</th>
<th>Estimated Overhead</th>
<th>Expected Use of Cost Drivers per Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researching legal issues</td>
<td>$31,500</td>
<td>900 research hours</td>
</tr>
<tr>
<td>Preparing legal documents</td>
<td>480,000</td>
<td>30,000 pages</td>
</tr>
<tr>
<td>Meeting with clients</td>
<td>1,760,000</td>
<td>8,800 professional hours</td>
</tr>
</tbody>
</table>

During 2016 the firm worked 660 research hours, 10,000 professional hours, and prepared 25,000 document pages.

Instructions
Compute the total overhead applied during 2016.


Solution 174 (3 min.)

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Estimated Overhead</th>
<th>Expected Use of Cost Drivers per Activity</th>
<th>Activity-Based Overhead Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researching legal issues</td>
<td>$31,500</td>
<td>900 research hours</td>
<td>$35 per res. hour</td>
</tr>
<tr>
<td>Preparing legal documents</td>
<td>480,000</td>
<td>30,000 pages</td>
<td>$16 per page</td>
</tr>
<tr>
<td>Meeting with clients</td>
<td>1,760,000</td>
<td>8,800 prof. hours</td>
<td>$200 per prof. hour</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost Drivers</th>
<th>Overhead Rates</th>
<th>Total Overhead Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>660 research hours</td>
<td>$35/research hour</td>
<td>$23,100</td>
</tr>
<tr>
<td>25,000 document pages</td>
<td>$16/page</td>
<td>400,000</td>
</tr>
<tr>
<td>10,000 professional hours</td>
<td>$200/professional hour</td>
<td>2,000,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$2,423,100</td>
</tr>
</tbody>
</table>

Ex. 175

Nancy Lake owns a small department store in a metropolitan area. For twenty years, the accountant has applied overhead to the various departments—Women’s Apparel, Men’s Apparel, Cosmetics, Housewares, Shoes, and Electronics—based on the basis of employee hours worked. Nancy Lake’s daughter, who is an accounting student at a local university, has suggested her mother should consider using activity-based costing (ABC). In an attempt to implement ABC, Nancy Lake and her daughter have identified the following activities.

Instructions
Determine a cost driver for each of the activities listed below.

<table>
<thead>
<tr>
<th>Cost Pool</th>
<th>Cost Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Placing orders</td>
<td></td>
</tr>
<tr>
<td>b. Stocking merchandise</td>
<td></td>
</tr>
<tr>
<td>c. Waiting on customers</td>
<td></td>
</tr>
<tr>
<td>d. Janitorial and maintenance</td>
<td></td>
</tr>
</tbody>
</table>

FOR INSTRUCTOR USE ONLY
Ex 175 (Cont.)
e. Training employees
   f. Administrative
   g. Advertising and Marketing
   h. Accounting and Legal Services
   i. Wrapping packages


Solution 175 (6 – 9 min.)

<table>
<thead>
<tr>
<th>Cost Pool</th>
<th>Cost Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Placing orders</td>
<td>number of orders; volume of individual orders</td>
</tr>
<tr>
<td>b. Stocking merchandise</td>
<td>number of orders; dollar volume of orders</td>
</tr>
<tr>
<td>c. Waiting on customers</td>
<td>number of customers; dollar volume of sales</td>
</tr>
<tr>
<td>d. Janitorial and Maintenance</td>
<td>square feet occupied; traffic through area</td>
</tr>
<tr>
<td>e. Training employees</td>
<td>total number of employees; number of new employees</td>
</tr>
<tr>
<td>f. Administrative</td>
<td>number of employees; dollar volume of business</td>
</tr>
<tr>
<td>g. Advertising and Marketing</td>
<td>number of ad campaigns</td>
</tr>
<tr>
<td>h. Accounting and Legal Services</td>
<td>dollar volume of sales</td>
</tr>
<tr>
<td>i. Wrapping packages</td>
<td>number of packages</td>
</tr>
</tbody>
</table>

Ex. 176

A list of possible cost drivers is presented below:

<table>
<thead>
<tr>
<th>Code</th>
<th>Cost Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Engineering hours</td>
</tr>
<tr>
<td>B</td>
<td>Setups</td>
</tr>
<tr>
<td>C</td>
<td>Machine hours</td>
</tr>
<tr>
<td>D</td>
<td>Number of subassemblies</td>
</tr>
<tr>
<td>E</td>
<td>Boxes</td>
</tr>
<tr>
<td>F</td>
<td>Orders</td>
</tr>
</tbody>
</table>

Instructions
For each of the following activity cost pools, select the most appropriate cost driver:

<table>
<thead>
<tr>
<th>Code</th>
<th>Cost Pool</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____</td>
<td>1. Machine setup</td>
</tr>
<tr>
<td>_____</td>
<td>2. Ordering and receiving</td>
</tr>
<tr>
<td>_____</td>
<td>3. Packaging and shipping</td>
</tr>
<tr>
<td>_____</td>
<td>4. Engineering design</td>
</tr>
</tbody>
</table>
Ex 176 (Cont.)

5. Machining
6. Assembly


Solution 176 (4 – 6 min.)

1. B 4. A
2. F 5. C
3. E 6. D

Ex. 177

Identify appropriate cost drivers for the following activity cost pools:
1. Human resources
2. Security
3. Receiving
4. Data processing


Solution 177 (3 – 5 min.)

1. Number of employees, number of hires
2. Square footage
3. Shipments received; pounds received
4. Lines printed, CPU minutes, storage units

Ex. 178

Two of the activity cost pools for Molina Company are (a) machining ($325,000) and (b) inspections ($42,000). Possible cost drivers are direct labor hours (2,550), machine hours (12,500), square footage (2,000), and number of inspections (200).

Instructions

Compute the overhead rate for each activity.


Solution 178 (4 – 6 min.)

(a) Machining: \( \frac{\$325,000}{12,500 \text{ machine hours}} = \$26 \text{ per machine hour} \)

(b) Inspections: \( \frac{\$42,000}{200 \text{ inspections}} = \$210 \text{ per inspection} \)

Ex. 179

Sutton Industries produces two models of televisions, Standard and Luxury. It sells 100,000 Standard televisions and 15,000 Luxury televisions annually. Sutton switched from traditional costing to activity-based costing and discovered that the cost allocated to Luxury televisions increased so dramatically that the Luxury was now only marginally profitable.

FOR INSTRUCTOR USE ONLY
Ex 179 (Cont.)

Instructions
Give a probable explanation for this shift.


Solution 179 (4 – 6 min.)
Low-volume products often require more special handling, such as more machine setups and inspections, than high-volume products. Also, the overhead costs incurred by the low-volume product are often disproportionate to a traditional allocation base such as direct labor hours.

Ex. 180
Compute activity-based costing rates from the following budgeted data for Upton Golf Co.:

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Budgeted Cost</th>
<th>Budgeted Cost Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designing</td>
<td>$2,550,000</td>
<td>75,000 designer hours</td>
</tr>
<tr>
<td>Machining</td>
<td>525,000</td>
<td>21,000 machine hours</td>
</tr>
<tr>
<td>Packing</td>
<td>620,000</td>
<td>31,000 labor hours</td>
</tr>
</tbody>
</table>


Solution 180 (3 – 5 min.)
Designing ($2,550,000 ÷ 75,000) = $34 per designer hour
Machining ($525,000 ÷ 21,000) = $25 per machine hour
Packing ($620,000 ÷ 31,000) = $20 per labor hour

EX. 181
We Store It Company rents storage units of various sizes to individuals and companies. The following activities have been identified as cost pools for accumulating overhead and assigning it to rental services provided. (a) repairs, (b) customer setups, (c) employee training, (d) supplies ordering, (e) temperature/humidity control, (f) security, and (g) cleaning.

Instructions
For each activity, identify a cost driver that might be used to assign overhead costs.


Solution 181 (2–4 min.)
(a) Number of repairs
(b) Number of customer setups
(c) Number of employees
(d) Number of supply orders
(e) Number of kilowatt hours of electricity
(f) Square footage
(g) Number of units cleaned
Ex. 182

American Delights manufactures a wide variety of holiday and seasonal decorative items. American's activity-based costing overhead rates are:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchasing</td>
<td>$380 per order</td>
</tr>
<tr>
<td>Storing</td>
<td>$2 per sq ft/days</td>
</tr>
<tr>
<td>Machining</td>
<td>$100 per machine hour</td>
</tr>
<tr>
<td>Supervision</td>
<td>$5 per direct labor hour</td>
</tr>
</tbody>
</table>

The Snow Man project involved three purchase orders, 4,000 square feet/days, 60 machine hours, and 40 direct labor hours. The cost of direct materials on the job was $19,000 and the direct labor rate is $30 per hour.

Instructions

Determine the total cost of the Snow Man project.


Solution 182  (5 – 7 min.)

<table>
<thead>
<tr>
<th>Cost Description</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td></td>
<td>$19,000</td>
</tr>
<tr>
<td>Direct labor</td>
<td>($40 x $30)</td>
<td>1,200</td>
</tr>
<tr>
<td>Factory overhead</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purchasing</td>
<td>(3 x $380)</td>
<td>1,140</td>
</tr>
<tr>
<td>Storing</td>
<td>(4,000 x $2)</td>
<td>8,000</td>
</tr>
<tr>
<td>Machining</td>
<td>(60 x $100)</td>
<td>6,000</td>
</tr>
<tr>
<td>Supervision</td>
<td>(40 x $5)</td>
<td>200</td>
</tr>
<tr>
<td>Total cost</td>
<td></td>
<td>$35,540</td>
</tr>
</tbody>
</table>

Ex. 183

Label the following costs as value-adding (VA) or non-value-adding (NVA):

___ 1. Engineering design
___ 2. Machine repair
___ 3. Inventory storage
___ 4. Machining
___ 5. Assembly
___ 6. Painting
___ 7. Inspections
___ 8. Packaging


Solution 183  (3 – 5 min.)

1. VA  
2. NVA  
3. NVA  
4. VA  
5. VA  
6. VA  
7. NVA  
8. VA  

FOR INSTRUCTOR USE ONLY
Ex. 184

Parton and Sons is a law firm that uses activity-based costing. Classify these activities as value-added or non-value-added:

1. Taking appointments
2. Reception
3. Meeting with clients
4. Bookkeeping
5. Court time
6. Meeting with opposing attorneys
7. Billing
8. Advertising


Solution 184 (3 – 5 min.)

1. Non-value-added
2. Non-value-added
3. Value-added
4. Non-value-added
5. Value-added
6. Value-added
7. Non-value-added
8. Non-value-added

Ex. 185

Merando Manufacturing Company manufactures small tools. Classify each of the following activity costs of the tool company as either unit-level, batch-level, product-level, or facility-level:

1. Plant management
2. Drilling
3. Painting
4. Machine setups
5. Product design
6. Cutting
7. Inspection
8. Inventory management


Solution 185 (4 – 6 min.)

1. Facility
2. Unit
3. Unit
4. Batch
5. Product
6. Unit
7. Batch
8. Product
Ex. 186

Castleman, Inc. designs, prints, and delivers advertising copy for companies throughout the tri-state area. Sometimes this entails designing and printing a single copy and other times multiple copies of the same advertisement. Listed below are typical activity costs:

(a) Printer ink.
(b) Paper
(c) Depreciation on equipment
(d) Machine setup costs
(e) Designing
(f) Supervisory salaries
(g) Ordering materials
(h) Delivery
(i) Building insurance
(j) Printing

Instructions
Classify each of these activities as either unit-level, batch-level, product-level, or facility-level.


Solution 186 (3–5 min.)

(a) Unit- or batch-level
(b) Unit- or batch-level
(c) Unit-level
(d) Batch-level
(e) Unit- or batch-level
(f) Facility-level
(g) Batch- or product-level
(h) Unit- or batch-level
(i) Facility-level
(j) Unit- or batch-level

Ex. 187

Jayson Woods, PSC is an architectural firm that uses activity-based costing. The three activity cost pools used by Jayson Woods are: Salaries and Wages, Travel Expense, and Plan Reproduction Expense. The firm has provided the following information concerning activity and costs:

<table>
<thead>
<tr>
<th>Activity Cost Pools</th>
<th>Project Assignment</th>
<th>Business Development</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries and wages</td>
<td>60%</td>
<td>30%</td>
<td>10%</td>
</tr>
<tr>
<td>Travel expense</td>
<td>40%</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>Plan reproduction expense</td>
<td>35%</td>
<td>40%</td>
<td>25%</td>
</tr>
</tbody>
</table>

Total $650,000
Instructions
Calculate the total cost to be allocated to the (a) Project Assignment, (b) Business Development, and (c) Other activity cost pools.


Solution 187  
(6 – 9 min.)

<table>
<thead>
<tr>
<th>Activity Cost Pools</th>
<th>(a) Project Assignment</th>
<th>(b) Business Development</th>
<th>(c) Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries and wages</td>
<td>$258,000</td>
<td>$129,000</td>
<td>$43,000</td>
<td>$430,000</td>
</tr>
<tr>
<td>Travel expense</td>
<td>40,000</td>
<td>40,000</td>
<td>20,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Plan reproduction expense</td>
<td>42,000</td>
<td>48,000</td>
<td>30,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Total</td>
<td>$340,000</td>
<td>$217,000</td>
<td>$93,000</td>
<td>$650,000</td>
</tr>
</tbody>
</table>
COMPLETION STATEMENTS

188. In traditional costing systems, direct labor cost is often used for the assignment of all __________________.

189. A __________________ is any activity that has a direct cause-effect relationship with the resources consumed.

190. In activity-based costing, overhead costs are allocated to ____________________, then assigned to products.

191. The number of __________________ is an appropriate cost driver for the ordering and receiving activity cost pool.

192. The primary benefit of activity-based costing is ____________________ product costing.

193. When product lines differ greatly in volume and manufacturing complexity, a switch from traditional costing to ____________________ is indicated.

194. Some __________________ increase the perceived worth of a product or service to customers.

195. In the hierarchy of activity levels, the four levels are __________, __________, __________, and __________.

196. Equipment setups are a __________________-level activity.

197. A primary objective of _________________ processing is to eliminate all manufacturing inventories.

198. Dependable suppliers, a multi-skilled workforce, and a ____________________________ are necessary elements of just-in-time processing.

FOR INSTRUCTOR USE ONLY
Answers to Completion Statements

188. overhead costs  
189. cost driver  
190. activity cost pools  
191. purchase orders  
192. more accurate  
193. activity-based costing  
194. value-added activities  
195. unit, batch, product, facility  
196. batch  
197. just-in-time  
198. total quality control system

MATCHING

199. Match the items in the two columns below by entering the appropriate code letter in the space provided.

A. Pull approach  
B. Cost driver  
C. Facility-level activity  
D. Unit-level activity  
E. Activity-based costing  
F. Just-in-time processing  
G. Batch-level activity  
H. Product-level activity  
I. Non-value-added activity  
J. Value-added activity

_____ 1. Allocates overhead to multiple activity cost pools, then assigns the activity cost pools to products.

_____ 2. An activity that has a direct cause-effect relationship with the resources consumed.

_____ 3. Increases the worth of a product or service to customers.

_____ 4. Should be eliminated or reduced.

_____ 5. Plant management.


_____ 7. Equipment setups.

_____ 8. Assembling.

_____ 9. Primary objective is to eliminate all manufacturing inventories.

_____ 10. Used to initiate manufacturing under JIT processing.

Answers to Matching

1. E  6. H
2. B  7. G
3. J  8. D
4. I  9. F
5. C  10. A

SHORT-ANSWER ESSAY QUESTIONS

S-A E 200

Delany Company uses a traditional costing system. Management is considering switching to an activity-based costing system. What steps must Delany take in initiating an activity-based costing system?


Solution 200

Delany Company must first identify the major activities that pertain to the manufacture of specific products, then allocate manufacturing overhead to activity cost pools. Next, Delany must identify the cost drivers that accurately measure each activity’s contribution to the finished product and compute activity-level overhead rates for each pool. Finally, the manufacturing overhead costs for each activity pool must be allocated to products, using the activity-based overhead rates.

S-A E 201

Feather, Inc. produces phasers (sales of 200,000 units per year) and force field enhancers (sales of 25,000 units per year). If Feather switches from traditional costing to activity-based costing, what is the likely effect on overhead assigned to the two products?


Solution 201

When overhead is properly assigned in ABC, it will usually increase the unit cost of low-volume products like the force field enhancers. This is because low-volume products often require more special handling, such as machine setups and inspections, than high-volume products. Also, overhead costs incurred by low-volume products often are disproportionate to a traditional allocation base.

S-A E 202

What are the conditions that would indicate to the management of a firm that they should switch from traditional costing to activity-based costing?

Solution 202

The presence of one or more of the following conditions indicates ABC as the superior costing system:
1) Product lines differ greatly in volume and manufacturing complexity.
2) Product lines are numerous and diverse, and they require differing degrees of support services.
3) Overhead costs constitute a significant portion of total costs.
4) The manufacturing process or the number of products has changed significantly.
5) Production or marketing managers are ignoring data provided by the existing system and are instead using alternative data when pricing or making other product decisions.

S-A E 203

Describe how the application of ABC to service companies is the same as its application to manufacturing companies.


Solution 203

The overall objective of ABC in service companies is the same as that for manufacturing companies; improved costing of services provided. The general approach to costing is the same: analyze operations, identify activities, assign overhead costs to activity cost pools, and identify and use cost drivers to assign the cost pools to the services.

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