

*Cost Accounting, Cdn. Ed., 7e (Horngren)*  
**Chapter 14 Period Cost Allocation**

14.1 Apply relevance as a criterion to decide how to allocate non-manufacturing (period) costs.

1) The allocation of one particular cost must satisfy all four justifications of cost allocation.

Answer: FALSE

Explanation: Managers may incorporate one or more of the justifications for their decisions about the design of a costing system.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-1

2) Indirect costs typically constitute a large percentage of the costs assigned to cost objects.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-1

3) Full product costing requires the recovery of all costs generated by all business functions in the value chain.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-1

4) The costs of designing and implementing sophisticated cost allocation systems are usually not very visible.

Answer: FALSE

Explanation: Time, aggravation, and money in changing the costing system are all too evident.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-1

5) If one is willing to put in the time and expense, it is always possible to identify the specific cause-and-effect relationship needed for a cost allocation base.

Answer: FALSE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-1

6) Benefits from using a well-designed cost allocation system are more evident than the costs.

Answer: FALSE

Explanation: Time, aggravation, and money in changing the costing system are all too evident. The benefits are less evident.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-1

7) One of the purposes of allocating indirect costs is to justify costs or compute reimbursement amounts.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-1

8) When using the causality criterion, cost drivers are selected based on a cause-and-effect relationship between the business functions.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-1

9) The ability-to-bear criterion is considered superior when the purpose of cost allocation is motivation.

Answer: FALSE

Explanation: The *cause-and-effect* or *benefits-received* criteria is considered superior when the purpose of cost allocation is motivation.

Diff: 2 Type: TF

Skill: Understand

Objective: LO 14-1

10) The narrower the scope of service provided by, for example, R&D, the more important it is to allocate costs proportionately to the benefits received by the internal users.

Answer: FALSE

Explanation: The broader the scope of service provided by, for example, R&D, the more important it is to allocate costs proportionately to the benefits received by the internal users.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-1

11) To encourage the design of products that are simpler to manufacture or less costly to service, would be an example of which cost allocation purpose?

A) to provide information for economic decisions

B) to motivate managers and employees

C) to determine employees' wages

D) to measure income and assets for reporting to external parties

E) to justify costs or compute reimbursements

Answer: B

Diff: 2 Type: MC

Skill: Remember

Objective: LO 14-1

12) Which of the following illustrates a purpose for allocating costs to cost objects?

- A) to provide information for economic decisions
- B) to reduce competition
- C) to determine employee benefit costs
- D) to defer income and reduce taxes payable
- E) to evaluate managers and employees

Answer: A

Diff: 2 Type: MC

Skill: Remember

Objective: LO 14-1

13) Deciding whether to make a component part or to purchase it, would be an example of which cost allocation purpose?

- A) to provide information for economic decisions
- B) to motivate managers
- C) to determine employee's wages
- D) to measure income and assets for reporting to external parties
- E) to motivate employees

Answer: A

Diff: 2 Type: MC

Skill: Understand

Objective: LO 14-1

14) For the economic decision purpose

- A) the costs in all six business functions should be included.
- B) costs for only one function is included.
- C) period costs are not allocated.
- D) costing is only related to product pricing.
- E) only inventoriable costs under GAAP/IFRS should be included.

Answer: A

Diff: 1 Type: MC

Skill: Remember

Objective: LO 14-1

15) Which of the following criteria subsidizes poor performers at the expense of the best performers?

- A) ability to bear
- B) benefit received
- C) causality
- D) fairness and equity
- E) benefits expended

Answer: A

Diff: 2 Type: MC

Skill: Remember

Objective: LO 14-1

16) The belief that a corporate division with higher sales ought to be allocated more of the company's advertising costs because it must have derived more benefit from the expenditures than a division with lower sales, is an example of which criteria for cost allocation decisions?

- A) ability to bear
- B) benefits expended
- C) causality
- D) fairness and equity
- E) benefit received

Answer: E

Diff: 2 Type: MC

Skill: Understand

Objective: LO 14-1

17) Which of the following is NOT a common criteria used to guide decisions related to cost allocations?

- A) ability to bear
- B) benefit received
- C) causality
- D) fairness and equity
- E) stable market prices

Answer: E

Diff: 1 Type: MC

Skill: Remember

Objective: LO 14-1

18) Which of the following is the first step in the cost-allocation decision process?

- A) Calculate the cost-allocation rate for each indirect cost pool.
- B) Identify the purpose of the cost allocation.
- C) Identify the direct inputs that are already measured.
- D) Identify the relevant indirect costs included in the cost pool(s) or numerator(s).
- E) Analyze the alternatives and select the best one for the denominator.

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 14-1

- 19) Which of the following is TRUE concerning cost allocation in a multi-product company?
- A) Where the indirect costs are variable and each product is assembled sequentially, the causality criterion can guide the choice of a cost allocation base.
  - B) Where the indirect costs are fixed and each product is assembled sequentially, the causality criterion can guide the choice of a cost allocation base.
  - C) Where the indirect costs are variable and each product is not assembled sequentially, the causality criterion can guide the choice of a cost allocation base.
  - D) Where the indirect costs are fixed and each product is not assembled sequentially, the causality criterion can guide the choice of a cost allocation base.
  - E) Where the indirect costs are fixed and the products are produced jointly, it is possible to identify specific cause-and-effect relationships between work on an individual product and total costs incurred.

Answer: A

Diff: 3 Type: MC

Skill: Understand

Objective: LO 14-1

- 20) Which purpose of cost allocation is used to encourage sales representatives to push high-margin products or services?

- A) to provide information for economic decisions
- B) to motivate managers and other employees
- C) to justify costs
- D) to measure income and assets for reporting to external parties
- E) to compute reimbursement

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 14-1

- 21) Which purpose of cost allocation is used to decide on the selling price for a customized product or service?

- A) to provide information for economic decisions
- B) to motivate managers and other employees
- C) to justify costs
- D) to measure income and assets for reporting to external parties
- E) to compute reimbursement

Answer: A

Diff: 2 Type: MC

Skill: Understand

Objective: LO 14-1

22) In a firm's value chain upstream costs are categorized as

- A) customer service costs.
- B) production costs.
- C) design costs.
- D) marketing costs.
- E) distribution costs.

Answer: A

Diff: 1 Type: MC

Skill: Remember

Objective: LO 14-1

23) Scarborough Sales, a real estate company specializing in apartment rentals and home sales, is having difficulty in gathering appropriate cost information for evaluating its operations. It owns several large apartment complexes and sells homes owned by builders or existing homeowners. As the company's new accountant you define cost by major activity. You use this information for allocating costs to cost objects. Also, cost pools are created for appropriate cost allocations. The owner of the company is interested in exactly what you have done, and why it appears to be working so smoothly.

Required:

Briefly state the four purposes for allocating costs to cost objects and give two examples of how each can be used for the real estate company.

Answer: The four purposes are:

1. To provide information for economic decisions.
2. To motivate managers and employees.
3. To justify costs or compute reimbursements.
4. To measure income and assets for reporting to external parties.

Examples are:

1.
  - a. Population growth in market area.
  - b. To determine if the company needs to go into the commercial market.
2.
  - a. Provide sales incentives through commission rates and sales volume goals.
  - b. Reward employees for selling high margin properties.
3.
  - a. Limit employee expenses on home sales to some percentage of selling price.
  - b. Provide sufficient customer services to attract new clients.
4.
  - a. Use of proper amortization methods for apartment buildings.
  - b. Properly accrue commissions at end of each accounting period.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-1

24) A company might choose to allocate corporate costs to various divisions within the company for what four purposes? Give an example of each.

Answer:

1. To provide information for economic decisions, for example, allocating costs from all six value-chain functions to decide on the selling price of a customized product.
2. To motivate managers and employees, for example, allocating corporate costs such as accounting support to division managers to discourage requesting a multitude of unnecessary financial reports.
3. To justify costs or compute reimbursement, for example, to allocate fixed design and production costs when arriving at a fair price for a government contract.
4. To measure income and assets for reporting to external parties, for example, allocating manufacturing overhead when costing inventories for financial statements presented in the company's annual report.

Note: Examples will vary.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-1

25) An electronics manufacturer is trying to encourage its engineers to design simpler products so that overall costs are reduced.

Required:

Which of the value-chain function costs (R&D, design, production, marketing, distribution, customer service) should be included in product-cost estimates to achieve the above purpose? Why?

Answer: All costs that are affected by the design should be included in the product cost estimate. These costs include the cost of design, production, distribution, and customer service.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 14-1

26) List three benefits from the careful costing of combinations of quantities of products and services in bundled products.

Answer: Any three of:

1. More accurate costing resulting more accurate full product pricing.
2. Refined cost systems improve the budgeting process.
3. Feedback in the form of variance analysis indicates when business functions are consuming more resources than budgeted.
4. Understanding which product bundles are more or less profitable enables managers to select the most profitable from among existing opportunities.

Diff: 2 Type: ES

Skill: Remember

Objective: LO 14-1

For each item listed, select the appropriate purpose of cost allocation from the list below. A purpose may be used more than once.

- A) To provide information for economic decisions
- B) To motivate managers and other employees
- C) To justify costs or compute reimbursement amounts
- D) To measure income and assets for reports to external parties

27) To cost a product at a fair price for government contracts

Diff: 2 Type: MA

Skill: Understand

Objective: LO 14-1

28) To encourage simpler product design

Diff: 2 Type: MA

Skill: Understand

Objective: LO 14-1

29) To decide on an appropriate selling price for a special-order product

Diff: 2 Type: MA

Skill: Understand

Objective: LO 14-1

30) To cost inventories for reporting on a company's tax return

Diff: 2 Type: MA

Skill: Understand

Objective: LO 14-1

31) To encourage the sales department to focus on high-margin products

Diff: 2 Type: MA

Skill: Understand

Objective: LO 14-1

32) To evaluate a make or buy decision

Diff: 2 Type: MA

Skill: Understand

Objective: LO 14-1

33) To cost inventories for the balance sheet

Diff: 2 Type: MA

Skill: Understand

Objective: LO 14-1

34) To decide whether to add or delete a product line

Diff: 2 Type: MA

Skill: Understand

Objective: LO 14-1



Answers: 27) C 28) B 29) A 30) D 31) B 32) A 33) D 34) A

14.2 Evaluate and select between a single- and dual-rate cost methods to apply period costs of support departments.

1) The single-rate method is when all indirect costs are combined in one cost pool and allocated to cost objects via a single rate per unit.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-2

2) One of the important aspects about the dual-rate method is that it allows managers to see how variable and fixed costs behave differently.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-2

3) The dual-rate cost allocation method classifies costs into two pools, a budgeted cost pool and an actual cost pool.

Answer: FALSE

Explanation: The dual-rate cost allocation method classifies costs into two pools, a variable cost pool and a fixed cost pool.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-2

4) The single-rate method makes a distinction between fixed and variable costs.

Answer: FALSE

Explanation: The single-rate method makes no distinction between fixed and variable costs.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-2

5) Using the single-rate method transforms the fixed costs per hour into a variable cost to users of that facility.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-2

6) The single-rate cost allocation method provides better information for decision making than the dual-rate method.

Answer: FALSE

Explanation: The dual-rate cost allocation method provides better information for decision making than the single-rate method.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-2

7) An advantage of the single-rate method is that it is easier and always the most accurate cost-allocation choice.

Answer: FALSE

Explanation: The single-rate method is the easiest cost allocation method, but it is the least accurate cost allocation choice.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-2

8) The use of budget capacity in the denominator rate for a fixed cost pool is preferable as it reduces the ability of managers to manipulate the allocation rate.

Answer: FALSE

Explanation: The use of practical capacity does not burden user departments with the cost of idle capacity and therefore reduces the incentive to over estimate budgeted hours.

Diff: 3 Type: TF

Skill: Understand

Objective: LO 14-2

9) The standard cost method uses budgeted cost driver use to determine the overhead allocation rate.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-2

10) The method that allocates costs in each cost pool using the same rate per unit is known as the

- A) incremental cost allocation method.
- B) reciprocal cost allocation method.
- C) single-rate cost allocation method.
- D) dual-rate cost allocation method.
- E) homogeneous cost allocation method.

Answer: C

Diff: 1 Type: MC

Skill: Remember

Objective: LO 14-2

11) Benefits of the single-rate method include

- A) the low cost of implementation.
- B) fixed costs that are transformed into variable costs for user decision making.
- C) signals regarding how variable and fixed costs behave differently.
- D) information that leads to outsourcing decisions that benefit the organization as a whole.
- E) there is a stronger cause and effect relationship.

Answer: A

Diff: 3 Type: MC

Skill: Understand

Objective: LO 14-2

12) Benefits of the dual-rate method include

- A) variable costs that are transformed into fixed costs for user decision making.
- B) the low cost of implementation.
- C) avoidance of expensive analysis for categorizing costs as either fixed or variable.
- D) information that leads to outsourcing decisions that benefit the organization as a whole.
- E) increased costs of implementation.

Answer: D

Diff: 3 Type: MC

Skill: Understand

Objective: LO 14-2

13) Under which of the following methods of cost allocation is there no distinction between fixed and variable costs?

- A) fixed method
- B) dual-rate method
- C) homogeneous method
- D) standard cost method
- E) single-rate method

Answer: E

Diff: 1 Type: MC

Skill: Remember

Objective: LO 14-2

14) Which cost allocation method differentiates between variable and fixed costs?

- A) dual-rate method
- B) heterogeneous method
- C) single-rate method
- D) variable method
- E) fixed rate method

Answer: A

Diff: 1 Type: MC

Skill: Remember

Objective: LO 14-2

Use the information below to answer the following question(s).

Data Source Media manufactures cassettes and CDs in separate divisions utilizing one plant location. The following data have been prepared for review.

Fixed operation costs	\$450,000
Practical capacity	1,250 hours
Budgeted usage:	
Cassette Division	1,000 hours
CD Division	175 hours
Budgeted variable cost per hour	\$600 per hour

15) What is the total cost per hour of use for the Cassette Division assuming budgeted usage is the allocation base and a single-rate method is used?

- A) \$1,050.00
- B) \$600.00
- C) \$982.98
- D) \$382.98
- E) \$360.00

Answer: C

Explanation: C) Cost per hour =  $[(\$450,000/1,175) + \$600] = \$982.98$   
= \$982.98 per hour used

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-2

16) What is the total cost per hour of use for the CD Division assuming the budgeted rate is used for variable costs and practical capacity is the allocation base for fixed costs?

- A) \$315.79
- B) \$950.00
- C) \$924.00
- D) \$960.00
- E) \$360.00

Answer: D

Explanation: D)  $(\$450,000/1,250 \text{ hours}) + \$600 = \$960.00$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-2

Use the information below to answer the following question(s).

General Media manufactures cassettes and CDs in separate divisions utilizing one plant location. The following data have been prepared for review.

Fixed operation costs	\$900,000
Practical capacity	2,500 hours
Budgeted usage:	
Cassette Division	2,000 hours
CD Division	350 hours
Budgeted variable cost per hour	\$400 per hour

17) What is the fixed cost per year and the variable cost per hour, respectively, for the General Media Cassette Division using the dual-rate method, assuming that the allocation bases are capacity for fixed costs and budgeted capacity for variable costs?

- A) \$720,000 and \$360
- B) \$720,000 and \$400
- C) \$765,958 rounded and \$400
- D) \$765,958 rounded and \$360
- E) \$900,000 and \$400

Answer: B

Explanation: B) Fixed cost per year =  $(\$900,000 / 2,500 \text{ hours}) \times 2,000 \text{ hours} =$

Variable cost per hour = \$400 per hour used

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-2

18) What are the fixed cost per year and the variable cost per hour for the General Media CD Division if the dual-rate method is used? Assume that the allocation bases are budgeted usage for fixed costs and for variable costs.

- A) \$100,270 and \$480
- B) \$126,000 and \$400
- C) \$134,043 rounded and \$480
- D) \$134,043 rounded and \$400
- E) \$900,000 and \$400

Answer: D

Explanation: D) Fixed cost per year =  $[(350 / 2,350) \times 900,000] = \$134,043$

Variable cost per hour = \$400 per hour used

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-2

19) What is the allocated cost to the two General Media divisions, respectively, if the single rate is \$1,000? Assume that the Cassette and CD Divisions used 1,750 and 200 hours, respectively.

- A) \$807,692 rounded and \$92,308 rounded
- B) \$900,000 and \$200,000
- C) \$1,750,000 and \$200,000
- D) \$2,800,000 and \$320,000
- E) \$900,000 and \$320,000

Answer: C

Explanation: C) Cassette:  $1,750 \times \$1,000 = \$1,750,000$

CD:  $200 \times \$1,000 = \$200,000$

Diff: 1 Type: MC

Skill: Apply

Objective: LO 14-2

20) What is the allocated cost to the two General Media divisions, respectively, if budgeted usage is the base for fixed costs and actual usage is the base for variable costs? (Use dual-rate method.) Assume that the Cassette and CD Divisions used 1,750 and 200 hours, respectively.

- A) \$1,050,000; \$120,000
- B) \$1,787,240; \$204,256
- C) \$1,465,957; \$214,043
- D) \$2,000,126; \$294,112
- E) \$1,787,240; \$254,043

Answer: C

Explanation: C) Cassette:  $(\$900,000 \times (2,000/2,350)) + (1,750 \times \$400) = \$1,465,957$

CD:  $(\$900,000 \times (350/2,350)) + (200 \times \$400) = \$214,043$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-2

Answer the following question(s) using the information below:

The Bonawitz Corporation has a central copying facility. The copying facility has only two users, the Marketing Department and the Operations Department. The following data apply to the coming budget year:

Budgeted costs of operating the copying facility for 200,000 to 300,000 copies:	
Fixed costs per year	\$30,000
Variable costs	3 cents (.03) per copy
Budgeted long-run usage in copies per year:	
Marketing Department	60,000 copies
Operations Department	190,000 copies

Budgeted amounts are used to calculate the allocation rates.

Actual usage for the year by the Marketing Department was 40,000 copies and by the Operations Department was 180,000 copies.

21) If a single-rate cost allocation method is used, what amount of copying facility costs will be *budgeted* for the Marketing Department?

- A) \$9,000
- B) \$1,800
- C) \$7,200
- D) \$28,500
- E) \$24,600

Answer: A

Explanation: A)  $[(60,000 / (60,000 + 190,000)) \times \$30,000] + (60,000 \times \$0.03) = \$7,200 + \$1,800 = \$9,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-2

22) If a single-rate cost allocation method is used, what amount of copying facility costs will be *allocated* to the Marketing Department? Assume actual usage is used to allocate copying costs.

- A) \$8,400
- B) \$9,000
- C) \$6,000
- D) \$4,800
- E) \$6,655

Answer: C

Explanation: C)  $\$30,000 + ((190,000 + 60,000) \times \$0.03) = \$37,500$

$\$37,500 / 250,000 \text{ copies} = \$0.15 \text{ per copy} \times 40,000 = \$6,000$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-2

23) If a dual-rate cost allocation method is used, what amount of copying facility costs will be *budgeted* for the Operations Department?

- A) \$28,500
- B) \$28,200
- C) \$30,245
- D) \$29,945
- E) \$24,600

Answer: A

Explanation: A)  $[(190,000/(60,000 + 190,000)) \times \$30,000] + (190,000 \times \$0.03) = \$28,500$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-2

24) If a dual-rate cost allocation method is used, what amount of copying facility costs will be *allocated* to the Operations Department? Assume budgeted usage is used to allocate fixed copying costs and actual usage is used to allocate variable copying costs.

- A) \$30,245
- B) \$29,945
- C) \$28,500
- D) \$28,200
- E) \$24,600

Answer: D

Explanation: D)  $[(190,000/(60,000 + 190,000)) \times \$30,000] + (180,000 \times \$0.03) = \$28,200$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-2



*Answer the following question(s) using the information below:*

The Fancy Flier Airplane Corporation has a central materials laboratory. The laboratory has only two users, the Large Plane Department and the Small Plane Department. The following data apply to the coming budget year:

<i>Budgeted costs of operating the materials laboratory for 10,000 to 20,000 technician hours per year:</i>	
<i>Fixed costs per year</i>	<i>\$600,000</i>
<i>Variable costs</i>	<i>\$80 per technician hour</i>
<i>Budgeted long-run usage in hours per year:</i>	
<i>Large Plane Department</i>	<i>9,000 technician hours</i>
<i>Small Plane Department</i>	<i>7,000 technician hours</i>

Budgeted amounts are used to calculate the allocation rates.

Actual usage for the year by the Large Plane Department was 6,000 technician hours and by the Small Plane Department was 6,500 technician hours.

25) If a single-rate cost allocation method is used, what is the allocation rate per hour used?

- A) \$80.00
- B) \$117.50
- C) \$146.67
- D) \$100.00
- E) \$128.00

Answer: B

Explanation: B)  $(\$600,000 + (16,000 \text{ hours} \times \$80)) / 16,000 \text{ hours} = \$117.50/\text{per hour used}$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-2

26) If a dual-rate cost allocation method is used, what amount of materials laboratory costs will be *budgeted* for the Large Plane Department?

- A) \$1,057,500
- B) \$822,500
- C) \$1,880,000
- D) \$1,600,000
- E) \$982,500

Answer: A

Explanation: A)  $[(9,000 / (9,000 + 7,000)) \times \$600,000] + (9,000 \times \$80) = \$1,057,500$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-2

27) If a single-rate cost allocation method is used, what amount of materials laboratory costs will be *allocated* to the Large Plane Department? Assume actual usage is used to allocate copying costs.

- A) \$1,057,500
- B) \$822,500
- C) \$763,750
- D) \$705,000
- E) \$1,476,923

Answer: D

Explanation: D)  $\$600,000 + ((9,000 + 7,000) \times \$80) = \$1,880,000$

$\$1,880,000 / 16,000 \text{ hours} = \$117.50 \text{ per hour} \times 6,000 = \$705,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-2

28) If a dual-rate cost allocation method is used, what amount of materials laboratory costs will be *allocated* to the Large Plane Department? Assume budgeted usage is used to allocate fixed materials laboratory costs and actual usage is used to allocate variable materials laboratory costs.

- A) \$782,500
- B) \$817,500
- C) \$822,500
- D) \$705,000
- E) \$996,923

Answer: B

Explanation: B)  $[(9,000 / (9,000 + 7,000)) \times \$600,000] + (6,000 \times \$80) = \$817,500$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-2

29) If a dual-rate cost allocation method is used, what amount of materials laboratory costs will be *budgeted* for the Small Plane Department?

- A) \$1,057,500
- B) \$763,750
- C) \$705,000
- D) \$822,500
- E) \$897,500

Answer: D

Explanation: D)  $[(7,000 / (9,000 + 7,000)) \times \$600,000] + (7,000 \times \$80) = \$822,500$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-2

30) If a dual-rate cost allocation method is used, what amount of materials laboratory costs will be *allocated* to the Small Plane Department? Assume budgeted usage is used to allocate materials laboratory costs and actual usage is used to allocate variable materials laboratory costs.

- A) \$822,500
- B) \$782,500
- C) \$817,500
- D) \$763,750
- E) \$832,000

Answer: B

Explanation: B)  $[(7,000/(9,000 + 7,000)) \times \$600,000] + (6,500 \times \$80) = \$782,500$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-2

*Answer the following questions using the information below:*

The Charmatz Corporation has a central copying facility. The copying facility has only two users, the Marketing Department and the Operations Department. The following data apply to the coming budget year:

*Budgeted costs of operating the copying facility  
for 400,000 to 600,000 copies:*

Fixed costs per year	\$60,000
Variable costs	3 cents (.03) per copy

*Budgeted long-run usage in copies per year:*

Marketing Department	120,000 copies
Operations Department	380,000 copies

Budgeted amounts are used to calculate the allocation rates.

Actual usage for the year by the Marketing Department was 80,000 copies and by the Operations Department was 360,000 copies.

31) If a single-rate cost allocation method is used, what amount of copying facility costs will be *budgeted* for the Marketing Department?

- A) \$18,000
- B) \$3,600
- C) \$14,400
- D) \$16,800

Answer: A

Explanation: A)  $[(120,000/(120,000 + 380,000)) \times \$60,000] + (120,000 \times \$0.03) = \$18,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-2

32) If a single-rate cost allocation method is used, what amount of copying facility costs will be *allocated* to the Marketing Department? Assume actual usage is used to allocate copying costs.

- A) \$16,800
- B) \$18,000
- C) \$12,000
- D) \$9,600

Answer: C

Explanation: C)  $\$60,000 + ((120,000 + 380,000) \times \$0.03) = \$75,000$

$\$75,000 / 500,000 \text{ copies} = \$0.15 \text{ per copy} \times 80,000 = \$12,000$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-2

33) If a dual-rate cost-allocation method is used, what amount of copying facility costs will be *budgeted* for the Operations Department?

- A) \$57,000
- B) \$56,400
- C) \$60,490
- D) \$59,890

Answer: A

Explanation: A)  $[(380,000)/(120,000 + 380,000)) \times \$60,000] + (380,000 \times \$0.03) = \$57,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-2

34) If a dual-rate cost-allocation method is used, what amount of copying facility costs will be *allocated* to the Operations Department? Assume budgeted usage is used to allocate fixed copying costs and actual usage is used to allocate variable copying costs.

- A) \$60,490
- B) \$59,890
- C) \$57,000
- D) \$56,400

Answer: D

Explanation: D)  $[(380,000)/(120,000 + 380,000)) \times \$60,000] + (360,000 \times \$0.03) = 56,400$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-2

35) Which of the following departments is least likely to be a support department for a boat manufacturing company?

- A) personnel
- B) moulding and assembly
- C) data processing
- D) accounting
- E) purchasing

Answer: B

Diff: 1 Type: MC

Skill: Understand

Objective: LO 14-2

36) AAA Fence Company manufactures wireless and aluminium fences in a common manufacturing facility. The company has become aware of unusual discrepancies in the costs of its products which management cannot explain. It seems that the sales and related production of wireless fences are in a very consistent growth market and are easily predicted. However, the sales and related production of aluminium fences are very erratic. Management does not understand why the costs per unit of wireless fences change when the production level seldom changes.

Required:

- a. After some investigation you determine that for the last two quarters, the common fixed cost of the manufacturing operation has been \$800,000. For the first quarter 12,000 wireless and 13,000 aluminium units were produced, respectively. For the second quarter, 12,000 wireless and 8,000 aluminium units were produced, respectively. What were the total cost per product and the cost per unit of each product in each quarter when production units is the allocation basis?
- b. After studying the results of the above computations you decide to use the company's average quarterly production of 12,000 wireless and 10,500 aluminium units as the allocation base, respectively. What are the total cost per product and the cost per unit per quarter for each product when average production is used?
- c. Which allocation base do you recommend, and why?

Answer:

a.

First quarter:

Wireless Fence:

Allocated costs:  $\$800,000 \times 12,000/25,000 = \$384,000$

Cost per unit:  $\$384,000/12,000 = \$32.00$

Aluminium Fence:

Allocated costs:  $\$800,000 \times 13,000/25,000 = \$416,000$

Cost per unit:  $\$416,000/13,000 = \$32.00$

Second quarter:

Wireless Fence:

Allocated costs:  $\$800,000 \times 12,000/20,000 = \$480,000$

Cost per unit:  $\$480,000/12,000 = \$40.00$

Aluminium Fence:

Allocated costs:  $\$800,000 \times 8,000/20,000 = \$320,000$

Cost per unit:  $\$320,000/8,000 = \$40.00$

b.

Average method, all quarters:

Wireless Fence:

Allocated costs:  $\$800,000 \times 12,000/22,500 = \$426,667$

Cost per unit:  $\$426,667/12,000 = \$35.56$

Aluminium Fence:

Allocated costs:  $\$800,000 \times 10,500/22,500 = \$373,333$

Cost per unit:  $\$373,333/10,500 = \$35.56$

c.

Approach in part b is better because it eliminates the short-run fluctuations of fences and provides management with a consistent cost pattern.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-2

37) The fixed costs of operating the maintenance facility of General Hospital are \$4,500,000 annually. Variable costs are incurred at the rate of \$30 per maintenance-hour. The facility averages 40,000 maintenance-hours a year. Budgeted and actual hours per user for the year are as follows:

	<u>Budgeted hours</u>	<u>Actual hours</u>
Building and grounds	10,000	12,000
Operating and emergency	8,000	8,000
Patient care	21,000	22,000
Administration	<u>1,000</u>	<u>1,200</u>
Total	<u>40,000</u>	<u>43,200</u>

Assume that budgeted maintenance-hours are used to calculate the allocation rates.

Required:

- If a single-rate cost allocation method is used, what amount of maintenance cost will be budgeted for each department?
- If a single-rate cost allocation method is used, what amount of maintenance cost will be allocated to each department based on actual usage?
- If a dual-rate cost allocation method is used, what amount of maintenance cost will be budgeted for each department?
- If a dual-rate cost allocation method is used, what amount of maintenance cost will be allocated to each department based on budgeted usage for fixed operating costs and actual usage for variable operating costs?

Answer:

- Total costs + \$4,500,000 + (\$30 × 40,000) = \$5,700,000

Single rate = \$5,700,000/40,000 mh = \$142.50 per maintenance-hour

*Single-rate budgeted amounts:*

Building and grounds	\$142.50 × 10,000	= \$1,425,000
Operating and emergency	\$142.50 × 8,000	= \$1,140,000
Patient care	\$142.50 × 21,000	= \$2,992,500
Administration	\$142.50 × 1,000	= \$142,500

- Total costs + \$4,500,000 + (\$30 × 40,000) = \$5,700,000

Single rate = \$5,700,000/40,000 mh = \$142.50 per maintenance-hour

*Single-rate allocated amounts:*

Building and grounds	\$142.50 × 12,000	= \$1,710,000
Operating and emergency	\$142.50 × 8,000	= \$1,140,000
Patient care	\$142.50 × 22,000	= \$3,135,000
Administration	\$142.50 × 1,200	= \$171,000



c. *Dual-rate budgeted amounts:*

Building and grounds:

Fixed ( $\$4,500,000 \times 10/40$ )	\$1,125,000
Variable ( $\$30 \times 10,000$ )	<u>300,000</u>
Total	<u>\$1,425,000</u>

Operating and emergency:

Fixed ( $\$4,500,000 \times 8/40$ )	\$900,000
Variable ( $\$30 \times 8,000$ )	<u>240,000</u>
Total	<u>\$1,140,000</u>

Patient care:

Fixed ( $\$4,500,000 \times 21/40$ )	\$2,362,500
Variable ( $\$30 \times 21,000$ )	<u>630,000</u>
Total	<u>\$2,992,500</u>

Administration:

Fixed ( $\$4,500,000 \times 1/40$ )	\$112,500
Variable ( $\$30 \times 1,000$ )	<u>30,000</u>
Total	<u>\$142,500</u>

d. *Dual-rate allocated amounts:*

Building and grounds:

Fixed ( $\$4,500,000 \times 10/40$ )	\$1,125,000
Variable ( $\$30 \times 12,000$ )	<u>360,000</u>
Total	<u>\$1,485,000</u>

Operating and emergency:

Fixed ( $\$4,500,000 \times 8/40$ )	\$900,000
Variable ( $\$30 \times 8,000$ )	<u>240,000</u>
Total	<u>\$1,140,000</u>

Patient care:

Fixed ( $\$4,500,000 \times 21/40$ )	\$2,362,500
Variable ( $\$30 \times 22,000$ )	<u>660,000</u>
Total	<u>\$3,022,500</u>

Administration:

Fixed ( $\$4,500,000 \times 1/40$ )	\$112,500
Variable ( $\$30 \times 1,200$ )	<u>36,000</u>
Total	<u>\$148,500</u>

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-2

38) The Alex Miller Corporation operates one central plant that has two divisions, the Flashlight Division and the Lamp Division. The following data apply to the coming budget year:

*Budgeted costs of the operating the plant  
for 10,000 to 20,000 hours:*

Fixed operating costs per year	\$240,000
Variable operating costs	\$10 per hour
Practical capacity	20,000 hours per year

*Budgeted long-run usage per year:*

Lamp Division	800 hours × 12 months =	9,600 hours per year
Flashlight Division	450 hours × 12 months =	5,400 hours per year

Assume that practical capacity is used to calculate the allocation rates. Further assume that actual usage of the Lamp Division was 700 hours and the Flashlight Division was 400 hours for the month of June.

Required:

- If a single-rate cost allocation method is used, what amount of operating costs will be budgeted for the Lamp Division each month? For the Flashlight Division each month?
- For the month of June, if a single-rate cost allocation method is used, what amount of cost will be allocated to the Lamp Division? To the Flashlight Division? Assume actual usage is used to allocate operating costs.
- If a dual-rate cost allocation method is used, what amount of operating costs will be budgeted for the Lamp Division each month? For the Flashlight Division each month?
- For the month of June, if a dual-rate cost allocation method is used, what amount of cost will be allocated to the Lamp Division? To the Flashlight Division? Assume budgeted usage is used to allocate fixed operating costs and actual usage is used to allocate variable operating costs.

Answer:

- Fixed costs  $\$240,000 / 20,000$  practical capacity hours = \$12/hour  
Single-rate cost-allocation =  $\$12 + \$10 = \$22$  per hour  

Lamp Division	$800 \times \$22/\text{hour} =$	\$17,600 per month
Flashlight Division	$450 \times \$22/\text{hour} =$	\$9,900 per month
- |                     |                                 |                    |
|---------------------|---------------------------------|--------------------|
| Lamp Division       | $700 \times \$22/\text{hour} =$ | \$15,400 per month |
| Flashlight Division | $400 \times \$22/\text{hour} =$ | \$8,800 per month  |
- Fixed costs  $\$240,000 / 20,000$  practical capacity hours = \$12/hour  
Budgeted costs — Lamp Division  
 $(800 \times \$12/\text{hour}) + (800 \times \$10/\text{hour}) =$  \$17,600 per month  
Budgeted costs — Flashlight Division  
 $(450 \times \$12/\text{hour}) + (450 \times \$10/\text{hour}) =$  \$9,900 per month
- Allocated costs for June — Lamp Division  
 $(800 \times \$12/\text{hour}) + (700 \times \$10/\text{hour}) =$  \$16,600 per month  
Allocated costs for June — Flashlight Division  
 $(450 \times \$12/\text{hour}) + (400 \times \$10/\text{hour}) =$  \$9,400 per month

Diff: 2 Type: ES

Skill: Analyze

Objective: LO 14-2

39) The Eco-Garden Corporation operates one central plant that has two divisions, the Lawnmower Division and the Weedwacker Division. The following data apply to the coming budget year:

*Budgeted costs of the operating the plant  
for 4,000 to 8,000 hours:*

Fixed operating costs per year \$280,000

Variable operating costs \$15 per hour

*Practical capacity* 7,000 hours per year

*Budgeted long-run usage per year:*

Lawnmower Division 325 hours  $\times$  12 months = 3,900 hours per year

Weedwacker Division 150 hours  $\times$  12 months = 1,800 hours per year

Assume that practical capacity is used to calculate the allocation rates. Further assume that actual usage of the Lawnmower Division was 350 hours and the Weedwacker Division was 200 hours for the month of June.

Required:

- If a single-rate cost allocation method is used, what amount of operating costs will be budgeted for the Lawnmower Division each month? For the Weedwacker Division each month?
- For the month of June, if a single-rate cost allocation method is used, what amount of cost will be allocated to the Lawnmower Division? To the Weedwacker Division? Assume actual usage is used to allocate operating costs.
- If a dual-rate cost allocation method is used, what amount of operating costs will be budgeted for the Lawnmower Division each month? For the Weedwacker Division each month?
- For the month of June, if a dual-rate cost allocation method is used, what amount of cost will be allocated to the Lawnmower Division? To the Weedwacker Division? Assume budgeted usage is used to allocate fixed operating costs and actual usage is used to allocate variable operating costs.

Answer:

- a. Fixed costs \$280,000/7,000 practical capacity hours = \$40/hour  
Single-rate cost-allocation = \$40 + \$15 = \$55 per hour  
*Lawnmower Division*      325 × \$55/hour =                      \$17,875 per month  
*Weedwacker Division*      150 × \$55/hour =                      \$8,250 per month
- b. *Lawnmower Division*      350 × \$55/hour =                      \$19,250 per month  
*Weedwacker Division*      200 × \$55/hour =                      \$11,000 per month
- c. Fixed costs \$240,000/20,000 practical capacity hours = \$12/hour  
Budgeted costs — Lawnmower Division  
    (325 × \$40/hour) + (325 × \$15/hour) =                      \$17,875 per month  
Budgeted costs — Weedwacker Division  
    (150 × \$40/hour) + (150 × \$15/hour) =                      \$8,250 per month
- d. Allocated costs for June — Lawnmower Division  
    (325 × \$40/hour) + (350 × \$15/hour) =                      \$18,250 per month  
Allocated costs for June — Weedwacker Division  
    (150 × \$40/hour) + (200 × \$15/hour) =                      \$9,000 per month

Diff: 2    Type: ES

Skill: Analyze

Objective: LO 14-2

For each of the following cost pools select an appropriate allocation base from the list below if the overall cost object is to assign costs to production departments. Each base can be used only once. Assume a manufacturing company.

- A) Number of employees per department.
- B) Machine hours by department.
- C) Hours of operation by production department.
- D) Operations costs of each department.
- E) Indirect labour hours per department.
- F) Hours of computer use per month per department.

40) Vice-president of finance's office expenses.

Diff: 1 Type: MA

Skill: Apply

Objective: LO 14-2

41) Computer operations used in conjunction with manufacturing.

Diff: 1 Type: MA

Skill: Apply

Objective: LO 14-2

42) Personnel department.

Diff: 1 Type: MA

Skill: Apply

Objective: LO 14-2

43) Manufacturing machinery cost.

Diff: 1 Type: MA

Skill: Apply

Objective: LO 14-2

44) Energy costs.

Diff: 1 Type: MA

Skill: Apply

Objective: LO 14-2

Answers: 40) D 41) F 42) A 43) B 44) C

14.3 Analyze how the selection of the single or dual cost allocation rate affects the calculation of the efficiency variance.

1) The user department is responsible for any unfavourable cost variances during the budgeting period if budgeted prices and quantities are used for cost allocation.

Answer: FALSE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-3

2) User departments will be able to determine their allocated costs for each category in advance if budgeted usage is the allocation base.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-3

3) A budgeted rate helps to motivate the manager of a support department.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-3

4) A support department adds value directly to a product or service, which is observable by the customer.

Answer: FALSE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-3

5) When budgeted cost allocation rates are used, managers of the supplier division are motivated to improve efficiency.

Answer: TRUE

Diff: 2 Type: TF

Skill: Understand

Objective: LO 14-3

6) When budgeted cost allocation rates are used, variations in actual usage by one division affect the costs allocated to other divisions.

Answer: FALSE

Explanation: When *actual* cost-allocation rates are used, variations in actual usage by one division affect the costs allocated to other divisions.

Diff: 2 Type: TF

Skill: Understand

Objective: LO 14-3

7) When actual cost allocation rates are used, managers of the supplier division are motivated to improve efficiency.

Answer: FALSE

Explanation: When budgeted cost-allocation rates are used, managers of the supplier division are motivated to improve efficiency.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-3

- 8) When choosing between using budgeted rates, and actual rates, which of the following is TRUE?
- A) Actual rates let users know in advance what their costs are.
  - B) When budgeted rates are used, users must wait till the end of the budget period to know what their costs are.
  - C) With actual rates, a support department, rather than a user department, bears the risk of unfavourable cost variances.
  - D) Budgeted rates based on user department estimates may lead to outsourcing needed work, rather than relying on an internal support department.
  - E) Budgeted rates may help the manager of a support department to improve efficiency.

Answer: E

Diff: 3 Type: MC

Skill: Understand

Objective: LO 14-3

- 9) Fixed cost allocation rates should be determined using
- A) past production capacity.
  - B) short-term average usage.
  - C) short-term expected usage.
  - D) long-term expected usage.
  - E) actual usage.

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 14-3

Use the information below to answer the following question(s).

We Be Warehouse Fitness Equipment incurred \$80,000 of common fixed costs and \$120,000 of common variable costs. Data are provided below for the capacity allowed and the capacity used.

Department	Capacity Available in Hours	Capacity Used in Hours
Barbell Department	500	400
Sauna Department	300	400

For both departments, common fixed costs are to be allocated on the basis of capacity available and common variable costs are to be allocated on the basis of capacity used.

10) The fixed and variable costs allocated to the Barbell Department are

- A) \$50,000 and \$75,000, respectively.
- B) \$50,000 and \$60,000, respectively.
- C) \$30,000 and \$75,000, respectively.
- D) \$30,000 and \$60,000, respectively.
- E) \$30,000 and \$50,000 respectively.

Answer: B

Explanation: B) Barbell:  $[(500/(300 + 500)) \times \$80,000] = \$50,000$  fixed cost  
 $[(400/(400 + 400)) \times \$120,000] = \$60,000$  variable cost

Diff: 1 Type: MC

Skill: Apply

Objective: LO 14-3

11) The fixed and variable costs allocated to the Sauna Department are

- A) \$50,000 and \$75,000, respectively.
- B) \$50,000 and \$60,000, respectively.
- C) \$30,000 and \$75,000, respectively.
- D) \$30,000 and \$50,000, respectively.
- E) \$30,000 and \$60,000 respectively.

Answer: E

Explanation: E) Sauna:  $[(300/(300 + 500)) \times \$80,000] = \$30,000$  fixed cost  
 $[(400/(400 + 400)) \times \$120,000] = \$60,000$  variable cost

Diff: 1 Type: MC

Skill: Apply

Objective: LO 14-3



12) Assuming that fixed and variable costs are allocated according to capacity used then the fixed and variable costs allocated to the Barbell Department will be

- A) \$30,000 and \$50,000, respectively.
- B) \$30,000 and \$60,000, respectively.
- C) \$30,000 and \$75,000 respectively.
- D) \$40,000 and \$60,000, respectively.
- E) \$60,000 and \$40,000, respectively.

Answer: D

Explanation: D) Barbell:  $(400/800) \times \$80,000 = \$40,000$  fixed cost  
 $(400/800) \times \$120,000 = \$60,000$  variable cost

Diff: 1 Type: MC

Skill: Apply

Objective: LO 14-3

13) Assuming that that fixed and variable costs are allocated according to capacity used then the fixed and variable costs allocated to the Sauna Department will be

- A) \$30,000 and \$50,000, respectively.
- B) \$30,000 and \$60,000, respectively.
- C) \$30,000 and \$75,000 respectively.
- D) \$40,000 and \$60,000, respectively.
- E) \$60,000 and \$40,000, respectively.

Answer: D

Explanation: D) Sauna:  $(400/800) \times \$80,000 = \$40,000$  fixed cost  
 $(400/800) \times \$120,000 = \$60,000$  variable cost

Diff: 1 Type: MC

Skill: Apply

Objective: LO 14-3

14) An advantage to using budgeted usage, rather than actual usage, for the allocation base is that

- A) GAAP/IFRS requires it for comparability to previous years.
- B) variable costs are lower.
- C) management does not have to be accountable for actual costs since the system only deals with budgeted costs.
- D) it is consistent with a short-run time horizon.
- E) user divisions will know their allocated costs in advance.

Answer: E

Diff: 2 Type: MC

Skill: Understand

Objective: LO 14-3

- 15) A disadvantage of allocating fixed costs using a budgeted rate and actual usage is that
- A) supplying division managers may be tempted underestimate usage.
  - B) the allocation would capture the cause-and-effect relationship.
  - C) variation in usage will result in variances that need to be managed.
  - D) changes in one department's usage should not affect another department's allocation.
  - E) some organizations offer rewards to managers who make accurate forecasts.

Answer: A

Diff: 2 Type: MC

Skill: Understand

Objective: LO 14-3

- 16) Which of the following could be described as *a department that adds value to a product or service, which is observable by a customer*?

- A) a personnel department
- B) an assigned department
- C) a support department
- D) a service department
- E) an operating department

Answer: E

Diff: 1 Type: MC

Skill: Understand

Objective: LO 14-3

- 17) Which of the following does NOT apply to support departments?

- A) A support department is not an operating department.
- B) Support departments create special accounting problems when they provide reciprocal support to each other.
- C) An example of a support department would be a personnel department.
- D) To obtain accurate product costs requires the inclusion of support department costs.
- E) Direct support costs are always traced, indirect support department costs are allocated.

Answer: E

Diff: 2 Type: MC

Skill: Remember

Objective: LO 14-3

- 18) To discourage unnecessary use of a support department, management might

- A) not allocate any support department costs to user departments.
- B) allocate support department costs based upon user department usage.
- C) allocate a fixed amount of support department costs to each department regardless of use.
- D) issue memos on useful services provided by the support department.
- E) allocate only variable costs based on budgeted usage.

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 14-3

19) The costs of unused capacity are highlighted when

A) actual usage based allocations are used.

B) budgeted usage allocations are used.

C) practical capacity based allocations are used.

D) the dual-rate cost allocation method allocates fixed costs based on actual usage.

E) variable cost variances are evaluated.

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 14-3

20) Correl Company's power plant provides electricity for its two operating departments, A and B. The year 2015 budget for the power plant shows:

Budgeted fixed costs	\$80,000
Budgeted variable costs per kilowatt hour (kwh)	\$0.15

Additional data for 2015:

	Budget (kwh)	Actual (kwh)
Department A	240,000	215,000
Department B	160,000	195,000

Actual power plant costs: fixed \$92,000, variable \$88,000

Budgeted rates are used in the allocation of electricity cost.

Required:

- Compute the power plant costs allocated to A and B using the single-rate method with budgeted usage as the allocation base.
- Compute the power plant costs allocated to A and B using the dual-rate method with actual usage as the allocation base for variable costs and budgeted usage as the allocation base for fixed costs.
- From the standpoint of Departments A and B, what are the two main benefits of the dual-rate method?

Answer: Budgeted fixed rate =  $\$80,000 / (240,000 + 160,000) = \$0.20$  per kwh

- Total costs allocated to A =  $240,000 \times \$0.35 = \$84,000$   
Total costs allocated to B =  $160,000 \times \$0.35 = \$56,000$

- Allocated to Department A:

Fixed costs	= $240,000 \times \$0.20 =$	\$ 48,000
Variable costs	= $215,000 \times \$0.15 =$	<u>32,250</u>
		<u>\$ 80,250</u>

Allocated to Department B:

Fixed costs	= $160,000 \times \$0.20 =$	\$ 32,000
Variable costs	= $195,000 \times \$0.15 =$	<u>29,250</u>
		<u>\$ 61,250</u>

- First, costs allocated to each department are not affected by the kwh usage of the other department. Second, inefficiencies in the power plant are not charged to Departments A and B.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-3

21) Barrel Company's power plant provides electricity for its two operating departments, A and B. The year 2015 budget for the power plant shows:

Budgeted fixed costs	\$107,200
Budgeted variable costs per kilowatt hour (kwh)	\$0.05

Additional data for 2015:

	Budget (kwh)	Actual (kwh)
Department A	490,000	525,000
Department B	180,000	165,000

Actual power plant costs: fixed \$132,000, variable \$41,400

Budgeted rates are used in the allocation of electricity cost.

Required:

- Compute the power plant costs allocated to A and B using the single-rate method with budgeted usage as the allocation base.
- Compute the power plant costs allocated to A and B using the dual-rate method with actual usage as the allocation base for variable costs and budgeted usage as the allocation base for fixed costs.
- From the standpoint of Departments A and B, what are the two main benefits of the dual-rate method?
- Calculate the variable overhead efficiency variances for each department. Who would be the appropriate person(s) to provide information on the causes of these variances?

Answer: Budgeted fixed rate =  $\$107,200 / (490,000 + 180,000) = \$0.16$  per kwh

- a. Total costs allocated to A =  $490,000 \times \$0.21 = \$102,900$   
Total costs allocated to B =  $180,000 \times \$0.21 = \$ 37,800$

- b. Allocated to Department A:

Fixed costs	= $490,000 \times \$0.16 =$	\$ 78,400
Variable costs	= $525,000 \times \$0.05 =$	<u>26,250</u>
		<u>\$104,650</u>

Allocated to Department B:

Fixed costs	= $180,000 \times \$0.16 =$	\$ 28,800
Variable costs	= $165,000 \times \$0.05 =$	<u>8,250</u>
		<u>\$ 37,050</u>

- c. First, costs allocated to each department are not affected by the kwh usage of the other department. Second, inefficiencies in the power plant are not charged to Departments A and B.

- d. VO rate variance Dept. A:  $(490,000 \text{ kwh} - 525,000 \text{ kwh}) \times \$ 0.05 = \$1,750 \text{ U}$

VO rate variance Dept. B:  $(180,000 \text{ kwh} - 165,000 \text{ kwh}) \times \$0.05 = \$ 750 \text{ F}$

The department managers will likely be the most appropriate persons to provide information regarding the causes of these variances.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-3; 8-2

22) The cost of operating the quality control department of Ames Manufacturing includes \$608,000 of fixed costs and \$400,000 of variable costs. The department normally budgets 21,000 inspection hours a year. Two departments receive quality control checks, fabrication and assembly. Fabrication is budgeted at 12,000 hours a year, while assembly is budgeted the remainder.

Required:

- In July, fabrication used 1,000 inspection hours and assembly used 800 hours. How much did each department receive in quality control costs assuming a single-rate is used based on budgeted hours?
- In August, fabrication used 1,200 inspection hours and assembly used 900 hours. How much did each department receive in quality control costs assuming a dual-rate is used with budgeted usage for fixed costs and actual usage for variable costs?
- Which method seems more appropriate in this case? Explain.

Answer:

- $\text{Total costs} = \$608,000 + \$400,000 = \$1,008,000$   
 $\text{Overhead rate} = \$1,008,000 / 21,000 = \$48 \text{ per inspection hour used}$   
 $\text{Fabrication charge} = \$48 \times 1,000 = \$48,000$   
 $\text{Assembly charge} = \$48 \times 800 = \$38,400$
- $\text{Fixed rate} = \$608,000 / 21,000 = \$28.95$   
 $\text{Variable rate} = \$400,000 / 21,000 = \$19.05$

Fabrication charge:

Fixed ( $\$28.95 \times 1,000$ )	\$28,950
Variable ( $\$19.05 \times 1,200$ )	<u>22,860</u>
Total	<u>\$51,810</u>

Assembly charge:

Fixed ( $\$28.95 \times (9,000/12)$ )	\$21,713
Variable ( $\$19.05 \times 900$ )	<u>17,145</u>
Total	<u>\$38,858</u>

- The dual-rate method is more appropriate because fixed costs are capacity costs and as such are not affected by inspection hours within a relevant range.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-3

23) Marvelous Motors is a small motor supply outlet that sells motors to companies that make various small motorized appliances. The fixed operating costs of the company are \$300,000 per year. The controlling shareholder, interested in product profitability and pricing, wants all costs allocated to the motors and wants to review the company status on a quarterly basis. The shareholder is trying to determine whether the costs should be allocated each quarter based on the 25% of the annual fixed operating costs (\$75,000) or by using an annual forecast budget to allocate the costs. The following information is provided for the operations of the company:

	<u>Forecast</u>	<u>Actual</u>
Sales for First Quarter	5,000	4,850
Sales for Second Quarter	8,000	7,900
Sales for Third Quarter	8,000	8,125
Sales for Fourth Quarter	3,000	3,125

Required:

- What amount of fixed operating costs are assigned to each motor by quarter when actual sales are used as the allocation base and \$75,000 is allocated?
- How much fixed cost is recovered each quarter under requirement a.?
- What amount of fixed operating costs are assigned to each motor by quarter when forecast sales are used as the allocation base and the rate is calculated annually as part of the budgetary process?
- How much fixed cost is recovered each quarter under requirement c.?
- Which method seems more appropriate in this case? Explain.

Answer:

- Rate per unit using Actual Sales by Quarter:*

Q1  $\$75,000 / 4,850 = \$15.46$  per motor

Q2  $\$75,000 / 7,900 = \$9.49$  per motor

Q3  $\$75,000 / 8,125 = \$9.23$  per motor

Q4  $\$75,000 / 3,125 = \$24.00$  per motor

- $\$75,000$  cost is recovered each quarter = \$300,000 cost recovered over the year

- Quarterly Cost Recovery using Annual Forecast of Sales:*

Forecast Sales for the year =  $5,000 + 8,000 + 8,000 + 3,000 = 24,000$

Rate per motor =  $\$300,000 / 24,000 = \$12.50$  per motor

- Quarterly Cost Recovery using Annual Forecast of Sales as the allocation basis:*

Q1  $4,850 \times \$12.50 = \$60,625$

Q2  $7,900 \times \$12.50 = \$98,750$

Q3  $8,125 \times \$12.50 = \$101,563$

Q4  $3,125 \times \$12.50 = \$39,062 = \$300,000$  cost recovered over the year

- The budgeted rate based on an annualized forecast of sales is more appropriate to use. The fluctuations in sales was predictable and using actual quantities per quarter to calculate the cost recovery rates would distort the objective of assigning appropriate costs to the units. There would be uncertainty in interpretation of why one quarter has a very high rate per unit and another quarter has a very low rate per unit if the actual quarters fixed costs were spread to the actual units sold each quarter.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-3



24) Blaster Drive-In is a fast-food restaurant that sells burgers and hot dogs in a 1950s environment. The fixed operating costs of the company are \$5,000 per month. The controlling shareholder, interested in product profitability and pricing, wants all costs allocated to either the burgers or the hot dogs. The following information is provided for the operations of the company:

	<u>Burgers</u>	<u>Hot Dogs</u>
Sales for January	4,000	2,400
Sales for February	6,400	2,400

Required:

- What amount of fixed operating costs is assigned to the burgers and hot dogs when actual sales are used as the allocation base for January? For February?
- Hot dog sales for January and February remained constant. Did the amount of fixed operating costs allocated to hot dogs also remain constant for January and February? Explain why or why not. Comment on any other observations.

Answer:

a. *January sales:*

Burgers	$\$5,000 \times 4,000 / (4,000 + 2,400) = \$3,125$
Hot dogs	$\$5,000 \times 2,400 / 6,400 = \$1,875$

*February sales:*

Burgers	$\$5,000 \times 6,400 / (6,400 + 2,400) = \$3,636.36$
Hot dogs	$\$5,000 \times 2,400 / (6,400 + 2,400) = \$1,363.64$

- Even though hot dog sales remained constant for both months, the allocation of fixed operating costs decreased by more than \$500. The reason is that fixed overhead costs are allocated based on actual sales. The dollar amount is fixed, and since burger sales increased, more of the fixed costs were allocated to the burgers.

Another observation is that burger sales increased by more than 50% from January to February, while the fixed operating costs assigned to burgers increased by only 16%.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-3

25) Should a company allocate its corporate costs to divisions?

Answer: Some companies allocate all corporate costs to divisions because corporate costs are incurred to support division activities. Allocating all corporate costs motivates division managers to examine how corporate costs are planned and controlled. Also, companies that want to calculate the full cost of products in order to make some economic decision must allocate corporate costs to indirect-cost pools of divisions.

Some companies do not allocate corporate costs to divisions because these costs are not controllable by division managers. Particularly if performance evaluations are based on these allocations, a company will often not choose to allocate certain corporate costs that are not perceived as being controllable by division management.

Other companies allocate only those corporate costs, such as corporate human resources, that are widely perceived as either causally related to division activities or provide explicit benefits to divisions.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 14-3

26) Van Meter Company has substantial fluctuations in its production costs because of the seasonality of figs. Most fig growers have two crops a year, one in June and one in August. However, the company has been importing figs from southern hemisphere countries, which extends the supply to the months of December and February.

Required:

What would you recommend as the monthly allocation base for the service departments of Van Meter Company? State your assumed cost object. A conceptual answer is required, not an example, such as cartons of figs.

Answer: The cost object probably should be department costs, but not on a monthly basis. The company should use a long-term budget amount for the base that is selected. Neither an actual amount nor an estimated budgeted monthly amount will provide the company with reliable allocation amounts because of the variability in the supply of the figs available for production. With long-term budgeted usage, the user departments will know their allocated costs in advance and this should help them in their planning of activities. The variable cost base should also be considered from a long-term perspective to avoid the seasonal fluctuations.

Diff: 3 Type: ES

Skill: Analyze

Objective: LO 14-3

27) Brandy has been manager of the downtown branch of General Bank for several years. During this time she has received very good annual evaluations for her management of the branch. However, during the current year (it is now July) she has been upset with the monthly performance report generated by the budgeting department at the home office. Her branch has been making steady progress with controlled growth during the year and she knows of no reason why the report has such widely fluctuating variances. One item that she suspects is causing some of the problem is that most of the costs of the bank are fixed, with each branch getting an allocation of home office expenses each month. The bank also has some branches which are fast growing and some of which are having operating difficulties. Required: From the information presented, what do you suggest as a possible cause of the reporting problems?

Answer: The probable cause of the variations in reporting is the growth fluctuations of the other branches. When fixed costs are involved in the allocation process, one unit receiving the allocation can have changes even when it does not change itself. This is caused by the other branches causing changes in the allocation base thereby causing everyone to receive different allocation amounts, even those who do not have changes in their base. The bank is probably using actual performance as the allocation base rather than a budgeted base for each month which itself is based on long-term performance.

Diff: 3 Type: ES

Skill: Analyze

Objective: LO 14-3

28) Why do organizations use budgeted rates instead of actual rates to allocate the costs of support departments to each other and to user departments and divisions? Explain.

Answer: The method of using actual rates based on costs realized during the period imposes a level of uncertainty on the user departments.

When allocations are made using budgeted rates, managers of departments to which costs are allocated know with certainty the rates to be used in that budgetary period. Users can determine the amount of service to request. Budgeted rates also help motivate the manager of the support department to improve efficiency. The supplier department bears the risk of unfavorable variances and is aware of factors which may be causing negative variances. In cases where the support department's costs are out of control of the support department manager, the uncontrollable factors can be identified and the supplier department can either be relieved of responsibility for those specific factors or there can be a risk sharing agreement negotiated between the support department and the user departments.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 14-3

14.4 Evaluate and select among the direct, step-down, and reciprocal methods of allocating support division costs to production divisions.

1) The direct allocation method ignores any services rendered between support departments.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-4

2) The step-down allocation method allows partial recognition of services rendered by support departments to other support departments.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-4

3) The reciprocal allocation method does not incorporate interdepartmental relationships fully into the support department cost allocations.

Answer: FALSE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-4

4) The direct allocation method provides key information for outsourcing decisions regarding support services.

Answer: FALSE

Explanation: *Complete reciprocal costs* of a support department provide key information for outsourcing decisions regarding support services. The direct allocation method does not provide this information.

Diff: 3 Type: TF

Skill: Understand

Objective: LO 14-4

5) The step-down method allocates support department costs to other support departments and to operating departments in a sequential manner.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-4

6) The reciprocal method of support department cost allocation is the most precise method and therefore is widely adopted.

Answer: FALSE

Explanation: The reciprocal method of support department cost allocation is the most precise method but is not often used due to many managers finding it difficult to understand; and, in some cases the results don't differ materially from the other methods.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-4

- 7) To discourage excessive use of a support department, management might
- A) not allocate any costs of the support departments.
  - B) allocate costs based on user department usage.
  - C) allocate a fixed amount to each department regardless of use.
  - D) expense fixed costs of support departments directly to the income statement.
  - E) create special accounting records for the support department.

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 14-4

- 8) Which of the following methods of allocating support department costs is both simple and intuitive?
- A) linear equation method
  - B) step-down method
  - C) hybrid method
  - D) reciprocal method
  - E) direct allocation method

Answer: E

Diff: 1 Type: MC

Skill: Understand

Objective: LO 14-4

*Use the information below to answer the following question(s).*

Joe's Tire Company has two support departments, Personnel and Maintenance. The Maintenance Department costs of \$80,000 are allocated on the basis of standard service hours used. The Personnel Department costs of \$20,000 are allocated based on the number of employees. Costs of Departments A and B are \$40,000 and \$60,000, respectively.

Data on standard service hours and number of employees are as follows:

	Maintenance Dept.	Personnel Dept.	Production_ Dept. A	Production_ Dept. B
Standard service hours used	200	200	240	160
Number of employees	10	20	40	120

- 9) How much of the cost of the Maintenance Department is allocated to Department B using the direct method?
- A) \$16,000
  - B) \$12,800
  - C) \$32,000
  - D) \$24,000
  - E) \$60,000

Answer: C

Explanation: C)  $[(160/(160 + 240)) \times \$80,000] = \$32,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-4

10) How much of the cost of the Personnel Department is allocated to Department B using the direct method?

- A) \$8,000
- B) \$15,000
- C) \$5,000
- D) \$12,632
- E) \$60,000

Answer: B

Explanation: B)  $[(120/160) \times \$20,000] = \$15,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-4

11) How much of the cost of the Personnel Department is allocated to Department A using the direct method?

- A) \$5,000
- B) \$15,000
- C) \$4,211
- D) \$12,632
- E) \$40,000

Answer: A

Explanation: A)  $[(40/160 \times \$20,000)] = \$5,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-4

12) What is the cost of the Maintenance Department allocated to Department B using the step-down method if the support department with the highest percentage of interdepartmental service to the other support department is allocated first?

- A) \$16,000
- B) \$21,333
- C) \$12,800
- D) \$32,000
- E) \$48,000

Answer: B

Explanation: B) Maintenance provided to Personnel:  $200/600 = .333$

Personnel provided to Maintenance:  $10/170 = .059$

Dept. B:  $160/600 \times \$80,000 = \$21,333$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-4

13) What is the cost allocated from the Maintenance Department to Department A using the step-down method if the Personnel Department is allocated first?

- A) \$48,000
- B) \$48,706
- C) \$5,000
- D) \$12,000
- E) \$14,118

Answer: B

Explanation: B) Personnel cost allocated to Maintenance  $(10/170) \times \$20,000 = \$1,176$

Maintenance allocated to Dept A  $(\$80,000 + \$1,176) \times (240/400) = \$48,706$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-4

14) What is the cost of the support departments allocated to Department B using the step-down method if the support department with the highest percentage of interdepartmental service to the other support department is allocated first?

- A) \$43,660
- B) \$21,333
- C) \$53,412
- D) \$46,588
- E) \$ 56,313

Answer: E

Explanation: E) Maintenance provided to Personnel:  $200/600 = .333$

Personnel provided to Maintenance:  $10/170 = .059$

Maintenance to Personnel  $.333 \times \$80,000 = \$ 26,640$

Maintenance to Dept B  $160/600 \times \$80,000 \$ 21,333$

Personnel to Dept B  $(\$20,000 + \$26,640) \times (120/160) \underline{34,980}$   
\$ 56,313

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-4

15) What is the cost of the support departments allocated to Department A using the step-down method if the Personnel Department is allocated first?

- A) \$53,412
- B) \$43,660
- C) \$46,640
- D) \$46,588
- E) \$56,313

Answer: A

Explanation: A) Personnel cost allocated to Maintenance $(10/170) \times \$20,000 =$	\$1,176
Personnel cost allocated to Dept A $\$20,000 \times 40/170 =$	\$ 4,706
Maintenance cost allocated to Dept A $(\$1,176 + \$80,000) \times (240/400) =$	<u>48,706</u>
	<u>\$ 53,412</u>

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-4

16) Which method allocates costs by explicitly including the mutual services rendered among all support departments?

- A) the direct allocation method
- B) the interdepartmental method
- C) the reciprocal allocation method
- D) the step-down method
- E) the incremental method

Answer: C

Diff: 2 Type: MC

Skill: Remember

Objective: LO 14-4

17) Which of the following describes the complete reciprocated cost?

- A) It only includes the actual incurred cost of the operations department.
- B) It only includes the actual incurred cost of the support department.
- C) It is always larger than actual cost of the support departments.
- D) It is always less than actual cost.
- E) It is equal to the actual cost of the support departments.

Answer: C

Diff: 1 Type: MC

Skill: Remember

Objective: LO 14-4



Use the information below to answer the following question(s).

The owner of Hi-Tech Fiberglass Fabricators Inc. is interested in using the reciprocal allocation method. The following data from operations were collected for analysis.

Budgeted manufacturing overhead costs:

Plant Maintenance	PM (Support Dept.)	\$350,000
Data Processing	DP (Support Dept.)	\$75,000
Machining	M (Operating Dept.)	\$225,000
Capping	C (Operating Dept.)	\$125,000

Service furnished:

By Plant Maintenance (budgeted labour hours)

Data Processing	3,500
Machining	5,000
Capping	8,200

By Data Processing (budgeted computer time)

Plant Maintenance	600
Machining	3,500
Capping	600

18) Which of the following linear equations would represent the complete reciprocated cost of the Data Processing department?

- A)  $DP = \$75,000 + (600/4,700)PM$
- B)  $DP = \$75,000 + (3,500/16,700)PM$
- C)  $DP = \$75,000 \times (600/4,800) + \$350,000 \times (3,340/16,700)$
- D)  $PM = \$350,000 + (600/16,700)DP$
- E)  $PM = \$75,000 \times (600/4,700) + \$350,000 \times (3,340/16,700)$

Answer: B

Explanation: B)  $PM = \$350,000 + (600/4,700)DP$

$DP = \$75,000 + (3,500/16,700)PM$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-4

19) What is the complete reciprocated cost of the Data Processing and the Plant Maintenance, respectively?

- A) \$90,000 and \$393,750
- B) \$118,750 and \$365,000
- C) \$122,971 and \$375,773
- D) \$152,432 and \$375,773
- E) \$152,432 and \$369,459

Answer: E

Explanation: E)  $PM = \$350,000 + (600/4,700) \times [\$75,000 + (3,500/16,700)PM]$

$PM = \$350,000 + \$9,574 + 0.026755PM$

$0.973245PM = \$359,574$

$PM = \$369,459$

$DP = \$75,000 + 3,500/16,700(\$369,459)$

$DP = \$152,432$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-4

20) What is the Machining Department's allocation of both service departments respectively if their complete reciprocated cost were \$375,000 for Plant Maintenance and \$100,000 for Data Processing?

- A) \$112,275 and \$74,468
- B) \$131,250 and \$84,375
- C) \$281,250 and \$12,500
- D) \$337,500 and \$200,000
- E) \$337,500 and \$12,500

Answer: A

Explanation: A) Machining:  $PM = (5,000/16,700) \times \$375,000 = \$112,275$

$DP = (3,500/4,700) \times \$100,000 = \$74,468$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-4

21) What is the Capping Department's total cost if both service departments are allocated using the complete reciprocated cost method and their costs for the year were \$375,000 for Plant Maintenance and \$100,000 for Data Processing?

- A) \$412,766
- B) \$321,898
- C) \$196,898
- D) \$191,053
- E) \$184,132

Answer: B

Explanation: B) Capping:  $PM = (8,200/16,700) \times \$375,000 = \$184,132$

$DP = (600/4,700) \times \$100,000 = \$12,766$

Total costs =  $\$184,132 + \$12,766 + \$125,000 = \$321,898$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-4

22) Which method allows for partial recognition of the services rendered by support departments to other support departments?

- A) the direct allocation method
- B) the single-step allocation method
- C) the reciprocal allocation method
- D) the dual-rate method
- E) the step-down allocation method

Answer: E

Diff: 1 Type: MC

Skill: Apply

Objective: LO 14-4

23) Which of the following is a valid conclusion, in comparing the three allocation methods?

- A) The reciprocal method is conceptually inferior.
- B) The direct method is viewed as too complex by most organizations.
- C) The step-down method is viewed as too complex by most organizations.
- D) Many managers find the step-down method too simple.
- E) Many managers find the reciprocal method difficult to understand.

Answer: E

Diff: 1 Type: MC

Skill: Understand

Objective: LO 14-4

24) The step-down allocation method

- A) typically begins with the support department that provides the highest percentage of its total services to other support departments.
- B) recognizes the total amount of services that support departments provide to each other.
- C) allocates complete reciprocated costs.
- D) offers key input for outsourcing decisions.
- E) allocates support department costs to production departments only.

Answer: A

Diff: 2 Type: MC

Skill: Understand

Objective: LO 14-4

Answer the following question(s) using the information below:

Betty's Book and Music Store has two service departments, Warehouse and Data Centre. Warehouse Department costs of \$175,000 are allocated on the basis of budgeted warehouse-hours. Data Centre Department costs of \$75,000 are allocated based on the number of computer log-on hours. The costs of operating departments Music and Books are \$125,000 and \$150,000, respectively. Data on budgeted warehouse-hours and number of computer log-on hours are as follows:

	<i>Support Departments</i>		<i>Production Departments</i>	
	<b>Warehouse Department</b>	<b>Data Centre Department</b>	<b>Music</b>	<b>Books</b>
<i>Budgeted costs</i>	\$175,000	\$75,000	\$125,000	\$150,000
<i>Budgeted warehouse-hours</i>	NA	250	500	750
<i>Number of computer hours</i>	100	NA	400	500

25) Using the direct method, what amount of Warehouse Department costs will be allocated to Department Books?

- A) \$70,000
- B) \$105,000
- C) \$75,000
- D) \$87,500
- E) \$30,000

Answer: B

Explanation: B)  $750 / (500 + 750) \times \$175,000 = \$105,000$

D)

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-4

26) Using the direct method, what amount of Data Centre Department costs will be allocated to Department Music?

- A) \$75,000
- B) \$33,333
- C) \$41,667
- D) \$30,000
- E) \$97,222

Answer: B

Explanation: A)

B)  $400 / (400 + 500) \times \$75,000 = \$33,333$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-4

27) Using the step-down method, what amount of Data Centre Department cost will be allocated to the Warehouse Department if the service department with the highest percentage of interdepartmental support service is allocated first? (Round up)

- A) \$25,000
- B) \$75,000
- C) \$7,500
- D) \$0
- E) \$17,500

Answer: D

Explanation: D) Warehouse provided to Data Centre:  $250/(250 + 500 + 750) = .167$

Data Centre provided to Warehouse:  $100/(100 + 400 + 500) = .100$

Warehouse provides the greatest amount of service to support departments, so it is allocated first.

Therefore, there will be no cost from the Data Centre allocated to the Warehouse department.

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-4

28) Using the step-down method, what amount of Warehouse Department cost will be allocated to Music Department if the service department with the highest percentage of interdepartmental support service is allocated first? (Round up)

- A) \$58,333
- B) \$116,667
- C) \$60,833
- D) \$121,667
- E) \$0

Answer: A

Explanation: A) Warehouse provided to Data Centre:  $250/(250 + 500 + 750) = .167$

Data Centre provided to Warehouse:  $100/(100 + 400 + 500) = .100$

Warehouse provides the greatest amount of service to support departments, so it is allocated first.

Dept Music:  $500/(250 + 500 + 750) \times \$175,000 = \$58,333$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-4

29) Using the step-down method, what amount of Data Centre Department cost will be allocated to Department Music if the service department with the highest percentage of interdepartmental support service is allocated first? (Round up)

- A) \$58,671
- B) \$33,333
- C) \$46,296
- D) \$41,667
- E) \$0

Answer: C

Explanation: C) Warehouse provided to Data Centre:  $250/(250 + 500 + 750) = .167$

Data Centre provided to Warehouse:  $100/(100 + 400 + 500) = .100$

Warehouse provides the greatest amount of service to support departments, so it is allocated first.

Data Centre gets costs from Warehouse =  $.167 \times (\$175,000) = \$29,167$

Data Centre total costs are now =  $\$75,000 + \$29,167 = \$104,167$

Allocation of Data Centre to Music =  $(400/(400+500)) \times \$104,167 = \$46,296$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-4

*Answer the following questions using the information below:*

Jake's Battery Company has two service departments, Maintenance and Personnel. Maintenance Department costs of \$320,000 are allocated on the basis of budgeted maintenance-hours. Personnel Department costs of \$80,000 are allocated based on the number of employees. The costs of operating departments A and B are \$160,000 and \$240,000, respectively. Data on budgeted maintenance-hours and number of employees are as follows:

	<i>Support Departments</i>		<i>Production Departments</i>	
	<b>Maintenance Department</b>	<b>Personnel Department</b>	<b>A</b>	<b>B</b>
<i>Budgeted costs</i>	\$320,000	\$80,000	\$160,000	\$240,000
<i>Budgeted maintenance-hours</i>	NA	800	960	640
<i>Number of employees</i>	40	NA	160	480

30) Using the direct method, what amount of Maintenance Department costs will be allocated to Department B?

- A) \$96,000
- B) \$128,000
- C) \$156,000
- D) \$192,000

Answer: B

Explanation: B)  $640/(640 + 960) \times \$320,000 = \$128,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-4

31) Using the direct method, what amount of Personnel Department costs will be allocated to Department B?

- A) \$20,000
- B) \$32,000
- C) \$48,000
- D) \$60,000

Answer: D

Explanation: D)  $480/640 \times \$80,000 = \$60,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-4

32) Using the step-down method, what amount of Maintenance Department cost will be allocated to Department B if the service department with the highest percentage of interdepartmental support service is allocated first? (Round up)

- A) \$64,000
- B) \$85,333
- C) \$114,667
- D) \$128,000

Answer: B

Explanation: B) Maintenance provided to Personnel:  $800/(800 + 960 + 640) = .333$

Personnel provided to Maintenance:  $40/(40 + 160 + 480) = .059$

Maintenance provides the greatest amount of service to support departments, so it is allocated first. Dept

B:  $640/2,400 \times \$320,000 = \$85,333$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-4

33) Using the step-down method, what amount of Maintenance Department cost will be allocated to Department A if the service department with the highest percentage of interdepartmental support service is allocated first? (Round up)

- A) \$64,000
- B) \$85,333
- C) \$114,667
- D) \$128,000

Answer: D

Explanation: D) Maintenance provided to Personnel:  $800/(800 + 960 + 640) = .333$

Personnel provided to Maintenance:  $40/(40 + 160 + 480) = .059$

Maintenance provides the greatest amount of service to support departments, so it is allocated first.

Dept A:  $960/(800 + 960 + 640) \times \$320,000 = \$128,000$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-4

Answer the following question(s) using the information below.

Joanne, owner of Automated Fabric, Inc., is interested in using the reciprocal allocation method. The following data from operations were collected for analysis:

*Budgeted manufacturing overhead costs:*

Maintenance	M (Support Dept)	\$150,000
Personnel	P (Support Dept)	\$80,000
Weaving	W (Weaving Dept)	\$325,000
Colourizing	C (Colourizing Dept)	\$175,000

*Services furnished:*

By Maintenance (budgeted labour-hours):	
to Personnel	500
to Weaving	3,500
to Colourizing	2,000
By Personnel (Number of employees serviced):	
Plant Maintenance	5
Weaving	15
Colourizing	10

34) Which of the following linear equations represents the complete reciprocated cost of the Personnel Department?

- A)  $P = \$150,000 - \$80,000 (500/6,000) M$
- B)  $P = (500/6,000) M$
- C)  $P = \$80,000 + (500/6,000) M$
- D)  $P = \$80,000$
- E)  $P = \$150,000 + (500/6,000) M$

Answer: C

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-4



35) What is the complete reciprocated cost of the Maintenance Department?

- A) \$165,634
- B) \$163,333
- C) \$150,000
- D) \$0
- E) \$93,803

Answer: A

Explanation: A)  $P = \$80,000 + (500/6,000) M$

$M = \$150,000 + (5/30) P$

$M = \$150,000 + (5/30) \times [\$80,000 + (500/6000) M]$

$M = \$150,000 + \$13,333 + (.013889) M$

$0.986111 M = \$163,333$

$M = \$165,634$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-4

36) What is the complete reciprocated cost of the Personnel Department?

- A) \$92,500
- B) \$93,803
- C) \$80,000
- D) \$105,000
- E) \$165,634

Answer: B

Explanation: B)  $P = \$80,000 + (500/6,000) M$

$M = \$150,000 + (5/30) P$

$M = \$150,000 + (5/30) \times [\$80,000 + (500/6000) M]$

$M = \$150,000 + \$13,333 + (.013889) M$

$0.986111 M = \$163,333$

$M = \$165,634$

$P = \$80,000 + (500/6,000) M$

$P = \$80,000 + (500/6,000) (\$165,634)$

$P = \$93,803$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-4

37) Seacrest Corp. allocates support department overhead costs to operating departments X and Y by means of the reciprocal allocation method. Information for the current month is as follows:

	<u>Support Departments</u>	
	<u>A</u>	<u>B</u>
Overhead Costs	<u>\$20,000</u>	<u>\$10,000</u>
Services provided from departments above:		
A	-	10%
B	20%	-
X	40%	30%
Y	<u>40%</u>	<u>60%</u>
	<u>100%</u>	<u>100%</u>

Required:

Provide the linear equation that represents the complete reciprocated cost of Support Department A.

Answer:  $A = \$20,000 + 0.10B$

The equation must include A's own costs plus its percentage of B's services, which is 10%.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-4

38) Rainier Manufacturing Company uses the step-down method for allocating its support department costs to operating departments. The overhead costs of support Department A are to be allocated first, followed by the costs of B, and then those of C. The distribution of services is as follows:

<u>Service Supplied by</u>	<u>Support Departments</u>			<u>Operating Departments</u>	
	<u>A</u>	<u>B</u>	<u>C</u>	<u>X</u>	<u>Y</u>
A	-	10%	50%	20%	20%
B	40%	-	15%	30%	15%
C	25%	25%	-	20%	30%

Required:

- Calculate the percentage of B's costs that should be allocated to Y.
- Calculate the percentage of C's costs that should be allocated to B.

Answer:

- Department A's costs have already been allocated, so its usage of B's services (40%) should be disregarded in answering the question:  $0.15 / (0.15 + 0.30 + 0.15) = 0.15 / 0.60 = 0.25$ , or 25%.

Note that the sequence of allocating the costs of the support departments in the question is consistent with the popular step-down sequence based on the percentage of a support department's total services rendered to other support departments.

<u>Order of Allocation</u>	<u>% of a Support Department's Total Services Rendered to other Support Departments</u>
1st A	10% to B + 50% to C = 60%
2nd B	40% to A + 15% to C = 55%
3rd C	25% to A + 25% to B = 50%

- Once a support department's costs are allocated under the step-down method, it receives no further allocation.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-4

39) Krum Lawn Equipment has five departments, of which Casting and Finishing are producing departments. Maintenance, Product Movement, and Inspection are service departments. The distribution of the service departments is as follows:

Service Costs

Services provided to:

	<u>Maint.</u>	<u>Prod. Move.</u>	<u>Insp.</u>	<u>Cast.</u>	<u>Finish.</u>
Maintenance	\$84,000	5%	25%	50%	20%
Product movement	160,000	10%	5	45	40
Inspection	38,000	15	5	20	60

Required:

Use the direct method to allocate the service departments' costs. Prepare a schedule showing the total costs allocated to each department.

Answer: Casting Finishing

Maintenance

$\$84,000 \times 50/70$

\$60,000

$\$84,000 \times 20/70$

\$24,000

Product movement

$\$160,000 \times 45/85$

84,706

$\$160,000 \times 40/85$

75,294

Inspection

$\$38,000 \times 20/80$

9,500

$\$38,000 \times 60/80$

28,500

Total

\$154,206

\$127,794

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-4

40) Broadway Department Store allocates the Personnel and Payroll Department's costs to the sales departments of Shoes, Automotive, and Clothing. Personnel and Payroll also provide services to each other. Personnel costs are allocated by number of employees, and payroll costs are allocated by gross payroll dollars. Costs and other information for January were as follows:

	Personnel	Payroll	Shoes	Automotive	Clothing
Current costs	\$13,800	\$6,400	\$24,400	\$40,000	\$31,500
Gross payroll	\$3,000	\$1,500	\$5,600	\$8,700	\$4,050
Number of employees	5	3	8	15	4

Required:

Prepare a schedule, which includes the total cost of operating the sales departments for January. Allocate service costs using the step-down method with the sequence of allocation based on highest percentage support concept.

Answer: Personnel cost to payroll =  $3/30 = 10\%$

Payroll cost to personnel =  $\$3,000/\$21,350 = 14.1\%$

Allocate payroll first because it serves personnel 14.1% versus 10% for personnel's service to payroll.

	Personnel	Payroll	Shoes	Auto	Clothing
Current costs	\$13,800	\$6,400	\$24,400	\$40,000	\$31,500
Payroll:		(6,400)			
\$3,000/\$21,350	899				
\$5,600/\$21,350			1,679		
\$8,700/\$21,350				2,608	
\$4,050/\$21,350					1,214
Personnel:	(14,699)				
8/27			4,355		
15/27				8,166	
4/27					2,178
Totals	\$0	\$0	\$30,434	\$50,774	\$34,892

Diff: 3 Type: ES

Skill: Apply

Objective: LO 14-4

41) Campaign Printing has two service departments, S1 and S2, and two production departments, P1 and P2. The data for April were as follows:

From:	Dept. Costs	Provided to:			
		S1	S2	P1	P2
S1	\$90,000		10%	40%	50%
S2	60,000	20%		55%	25%
P1	360,000				
P2	520,000				

Required:

- Set up algebraic equations in linear equation form for the service and production departments.
- Using the reciprocal method determine the reciprocated cost for each service department and allocate the reciprocated costs of each service department to the production departments.

Answer:

a.

$$S1 = \$90,000 + 0.20(S2)$$

$$P1 = \$360,000 + 0.40(S1) + 0.55(S2)$$

$$S2 = \$60,000 + 0.10(S1)$$

$$P2 = \$520,000 + 0.50(S1) + 0.25(S2)$$

b.

$$S1 = \$90,000 + 0.20(\$60,000 + 0.10(S1))$$

$$S1 = \$90,000 + \$12,000 + .02(S1)$$

$$.98(S1) = \$102,000$$

$$S1 = \$104,082$$

$$S2 = \$60,000 + (0.10 \times \$104,082) = \$70,408$$

$$P1 = \$360,000 + (0.40 \times \$104,082) + (0.55 \times \$70,408) = \$440,357$$

$$P2 = \$520,000 + (0.50 \times \$104,082) + (0.25 \times \$70,408) = \$589,643$$

Diff: 3 Type: ES

Skill: Apply

Objective: LO 14-4

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

	<i>Services Provided: (Annually)</i>				
	<b>Budget</b>	<b>Engineering</b>	<b>Computer Sciences</b>	<b>F&amp;T Maintenance</b>	<b>Enrollment Service</b>
<i>F&amp;T Maintenance</i> (in hours)	\$350,000	2,000	5,000	Zero	1,000
<i>Enrollment Service</i> (in credit hrs)	\$950,000	24,000	36,000	2,000	Zero

Required:

Use the direct method to allocate support costs to each of the two principal operating departments, Engineering and Computer Sciences. Prepare a schedule showing the support costs allocated to each department.

Answer:

		<b>Engineering</b>	<b>Computer Science</b>
<i>F&amp;T Maintenance</i>	$\$350,000 \times 2/7 =$	\$100,000	
	$\$350,000 \times 5/7 =$		\$250,000
<i>Enrollment Service</i>	$\$950,000 \times 24/60 =$	\$380,000	
	$\$950,000 \times 36/60 =$		\$570,000
<b>Total</b>		<b>\$480,000</b>	<b>\$820,000</b>

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-4

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

	<i>Services Provided: (Annually)</i>				
	<b>Budget</b>	<b>Engineering</b>	<b>Computer Sciences</b>	<b>F&amp;T Maintenance</b>	<b>Enrollment Service</b>
<i>F&amp;T Maintenance</i> (in hours)	\$350,000	1,000	2,000	Zero	5,000
<i>Enrollment Service</i> (in credit hrs)	\$950,000	24,000	36,000	2,000	Zero

Required:

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

Answer: F&T Maintenance provided to enrollment services =  $5,000/8,000$

Enrollment services provided to maintenance =  $2,000/62,000$

F&T Maintenance provides the greatest amount of service to support departments, so it is allocated first.

F&T Maintenance \$350,000 to Enrollment Services =  $\$350,000 \times 5/8 = \$218,750$

to Engineering =  $\$350,000 \times 1/8 = \$43,750$

to Computer Science =  $\$350,000 \times 2/8 = \$87,500$

Enrollment Service costs of  $\$950,000 + \$218,750 = \$1,168,750$

are allocated to Engineering and Computer Science

to Engineering =  $\$1,168,750 \times 24/60 = \$467,500$

to Computer Science =  $\$1,168,750 \times 36/60 = \$701,250$

<b>F&amp;T Maintenance</b>	<b>Enrollment Service</b>	<b>Engineering</b>	<b>Computer Science</b>
\$350,000	\$950,000		
( <u>\$350,000</u> )	218,750	\$43,750	\$87,500
<u>\$0</u>	( <u>\$1,168,750</u> )	<u>\$467,500</u>	<u>\$701,250</u>
<b>Totals</b>	<u>\$0</u>	<u>\$511,250</u>	<u>\$788,750</u>

Diff: 3 Type: ES

Skill: Apply

Objective: LO 14-4



44) Landmark Systems Inc. designs and manufactures global positioning navigation systems for all-terrain vehicles and water craft. It has two support departments: Design and Engineering; and, two production departments, Vehicle Systems and Water Craft Systems.

The budgeted level of service relationships at the start of the year was:

	Used by:			
	Design	Engineering	Vehicles	Water Craft
<b>Supplied by:</b>				
Design		0.10	0.40	0.50
Engineering	0.05		0.35	0.60

Landmark Systems Inc. collects fixed costs and variable costs of each support department in separate pools. The budgeted costs for the year were:

	Fixed-Cost Pools	Variable-Cost Pools
Design	\$800,000	\$960,000
Engineering	\$2,200,000	\$2,500,000

Support department pools are combined by cost behavior for allocation purposes.

Production statistics (actual) are as follows:

	Vehicles	Water Craft
Design hours	9,000	12,800
Engineering hours	25,600	19,400
Units produced	45,000	28,000

Required:

- Allocate the support department fixed costs using the dual-rate method. The company policy is to use design and engineering hours as the allocation base for variable costs; and, units produced for fixed costs. (round to the nearest cent)
- Allocate the support department fixed costs using the reciprocal method.
- Which method is preferable? Justify your answer.

Answer:

a. Dual-rate method

FC Pool  $(\$800,000 + \$2,200,000)/(45,000 + 28,000) = \$41.10$

Vehicles  $45,000 \times \$41.10 =$  \$1,849,500

Water Craft  $28,000 \times \$41.10 =$  1,150,800  
\$3,000,300

b. Reciprocal method

$$\begin{aligned} E &= \$2,200,000 + 0.10D \\ D &= \$800,000 + 0.05E \\ E &= \$2,200,000 + 0.10(\$800,000 + 0.05E) \\ E &= \$2,280,000 + 0.005E \\ 0.995E &= \$2,280,000 \\ E &= \$2,596,000 \div 0.995 \\ E &= \$2,291,457 \\ D &= \$800,000 + 0.05(\$2,291,457) \\ D &= \$914,573 \end{aligned}$$

	Design	Engineering	Vehicles	Water Craft
FC Pool	\$800,000	\$2,200,000		
Design (0.10, 0.40, 0.50)	(914,573)	91,457	\$365,829	\$457,287
Engineering (0.05, 0.35, 0.60)	114,573	(2,291,457)	802,010	1,374,874
	\$0	\$0	\$1,167,839	\$1,832,161

c. Reciprocal method advantage: considers support department services provided to each other. Dual rate method advantage: easier to understand.

Diff: 3 Type: ES

Skill: Apply

Objective: LO 14-2, 4

45) Landmark Systems Inc. designs and manufactures global positioning navigation systems for all-terrain vehicles and water craft. It has two support departments: Design and Engineering; and, two production departments, Vehicle Systems and Water Craft Systems.

The budgeted level of service relationships at the start of the year was:

	Used by:			
	Design	Engineering	Vehicles	Water Craft
<b>Supplied by:</b>				
Design		0.10	0.40	0.50
Engineering	0.05		0.35	0.60

Landmark Systems Inc. collects fixed costs and variable costs of each support department in separate pools. The budgeted costs for the year were:

	Fixed-Cost Pools	Variable-Cost Pools
Design	\$800,000	\$960,000
Engineering	\$2,200,000	\$2,500,000

Support department pools are combined by cost behavior for allocation purposes.

Production statistics (actual) are as follows:

	Vehicles	Water Craft
Design hours	9,000	12,800
Engineering hours	25,600	19,400
Units produced	45,000	28,000

Required:

- Allocate the support department variable costs using the dual-rate method. The company policy is to use design and engineering hours as the allocation base for variable costs; and, units produced for fixed costs. (round to the nearest cent)
- Allocate the support department variable costs using the reciprocal method.
- Comment on the effect from combining the variable cost pools as opposed to considering them separately when applying the allocation methods.

Answer:

a. Dual-rate method

VC Pool  $(\$960,000 + \$2,500,000)/(9,000 + 12,800 + 25,600 + 19,400) = \$51.80$

Vehicles  $(9,000 + 25,600) \times \$51.80 =$  \$1,172,280

Water Craft  $(12,800 + 19,400) \times \$51.80 =$  1,667,960  
\$3,460,240

b. Reciprocal method

$$\begin{aligned} E &= \$2,500,000 + 0.10D \\ D &= \$960,000 + 0.05E \\ E &= \$2,500,000 + 0.10(\$960,000 + 0.05E) \\ E &= \$2,596,000 + 0.005E \\ 0.995E &= \$2,596,000 \\ E &= \$2,596,000 \div 0.995 \\ E &= \$2,609,045 \\ D &= \$960,000 + 0.05(\$2,609,045) \\ D &= \$1,090,452 \end{aligned}$$

	Design	Engineering	Vehicles	Water Craft
VC Pool	\$960,000	\$2,500,000		
Design (0.10, 0.40, 0.50)	(1,090,452)	109,045	\$436,181	\$545,226
Engineering (0.05, 0.35, 0.60)	130,452	(2,609,045)	913,166	1,565,427
	\$0	\$0	\$1,349,347	\$2,110,653

c. Combining the variable costs pools eliminates the ability to differentiate the cost allocation that results from the vehicles and water craft using support department costs in different proportions.

Diff: 3 Type: ES

Skill: Apply

Objective: LO 14-2, 4

46) The manager of the Finishing Department is concerned about how the costs of service departments are being assigned to the Mixing Department. He knows that his department uses support activities entirely different from the other production departments. As a matter of fact, when something goes wrong in the Mixing Department the entire plant has to stop production because of the critical nature of the chemical processing in that department. Several support departments, such as maintenance and clean-up stop whatever they are doing and come to help the Mixing Department. However, it appears that the Mixing Department is not assigned any additional support costs because all support costs are assigned on the basis of actual outputs.

Required:

Explain the methods available for the allocation of costs from one department to another. Which method would you recommend for this company and why?

Answer: The single-rate method groups all costs into one cost pool and allocates them to cost objects using one rate from the single allocation base. The dual-rate method groups costs into separate cost pools, each of which may be allocated on a different base. The most common differentiation is between fixed and variable costs.

This company needs to use a dual method so that the extra time of Department 41 can be isolated and charged to it. This would still allow the other departments to share in the overall fixed costs of the emergency situation services without having to bear the variable costs of the repairs and clean-up.

Another aspect of cost allocation to be considered is the use of the direct, step-down, and reciprocal methods. Especially, the reciprocal method might reduce some of the problems being encountered.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-4

14.5 Analyze cost allocation procedures to apply common costs and justify contractual reimbursement terms.

1) The incremental common cost allocation method requires that one user be viewed as primary and other users as incremental.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-5

2) Allowable cost is the cost that the parties to a contract agree to exclude from reimbursed costs.

Answer: FALSE

Explanation: An allowable cost is a cost that the contract parties agree to include in the costs to be reimbursed.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-5

3) The stand-alone method of allocating common costs emphasizes fairness and equity among users.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-5

4) Under the incremental method, the first incremental user usually receives the highest allocation of the common costs.

Answer: FALSE

Explanation: Under the incremental method of allocating common costs, the *primary* user receives the highest allocation of the common costs.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-5

5) Without explicit written cost-plus contracts, producer costs can be passed on to the buyer.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 14-5

6) If the government wants to contract a very large scale project with significant uncertainty about what the final cost will be, often a cost-plus contract is awarded to attract qualified contractors who may otherwise not be willing to accept the risks inherent in a guaranteed bid price.

Answer: TRUE

Diff: 1 Type: TF

Skill: Understand

Objective: LO 14-5

7) The second-ranked cost object is termed the incremental party and is allocated a proportionate share of common costs based on revenue.

Answer: FALSE

Explanation: The second-ranked cost object is termed the incremental party and is allocated the additional cost that arises from there being two users instead of only the primary user.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 14-5

8) Which of the following terms describes a cost of operating a facility, operation, activity area, or like cost object that is shared by two or more users?

- A) common cost
- B) direct cost
- C) fixed cost
- D) varying cost
- E) sunk cost

Answer: A

Diff: 1 Type: MC

Skill: Remember

Objective: LO 14-5

9) Two entities, Cooper Company and Magic Company, share a common warehouse facility. Total costs for the facility are budgeted at \$2,000,000. Accountants have estimated that if Cooper Company did not use the facility the cost incurred would be reduced by 30 percent. What amount of the budgeted cost should be allocated, respectively, to Cooper and Magic if the incremental allocation method is used?

Assume that Magic is the primary party.

- A) \$0; \$1,400,000
- B) \$0; \$2,000,000
- C) \$1,400,000; \$600,000
- D) \$700,000; \$1,300,000
- E) \$600,000; \$1,400,000

Answer: E

Explanation: E) Cooper:  $0.3 \times \$2,000,000 = \$600,000$

Magic:  $0.7 \times \$2,000,000 = \$1,400,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-5

10) Cutler Hammer currently utilizes a manufacturing facility for \$200,000 per year. The facility is used at 70 percent capacity. The shipping department has proposed a plan in which it would utilize the other 30 percent plant capacity for the company's shipping plus handling the shipping of several nearby businesses. The company's consulting firm estimated that the overall costs of maintaining the space would increase by 12 percent.

The shipping manager is interested in the amount that would be allocated under the incremental method.

- A) \$70,000
- B) \$60,000
- C) \$84,000
- D) \$67,200
- E) \$24,000

Answer: E

Explanation: E)  $\$200,000 + 0.12 \times \$200,000 = \$224,000$ ; Incremental =  $\$224,000 - \$200,000 = \$24,000$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 14-5

11) Smith Company and Jones Company currently share an employee dining facility. Jones Company employs fewer people and believes that they should not be required to pay one-half of the \$300,000 costs incurred for the facility. An independent consulting firm stipulated that Smith Company could receive the same services for \$150,000 while Jones's employees could receive comparable services for \$100,000. What will be Jones's allocated cost if the stand-alone method is used?

- A) \$83,333
- B) \$100,000
- C) \$120,000
- D) \$150,000
- E) \$180,000

Answer: C

Explanation: C) Stand-alone =  $(\$100,000/\$250,000) \times \$300,000 = \$120,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-5

12) Two entities, Burch Company and Carey Company, share a common warehouse facility. Total costs for the facility are budgeted at \$1,000,000. Accountants have estimated that if Burch Company did not use the facility the cost incurred would be reduced by 30 percent.

What amount of the budgeted cost should be allocated, respectively, to Burch and Carey if the incremental allocation method is used?

- A) \$0; \$700,000
- B) \$0; \$1,000,000
- C) \$198,000; \$802,000
- D) \$300,000; \$700,000
- E) \$700,000; \$300,000

Answer: D

Explanation: D) Burch:  $0.30 \times \$1,000,000 = \$300,000$

Carey:  $0.70 \times \$1,000,000 = \$700,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-5

13) Under the stand-alone method of allocating common costs

- A) a ranking is used to allocate costs among the users.
- B) disputes can arise over who is the primary user.
- C) each party bears a proportionate share of the total costs in relation to their individual stand-alone costs.
- D) an incentive is created to be the first-ranked user.
- E) the parties are interested in being viewed as primary users.

Answer: C

Diff: 1 Type: MC

Skill: Remember

Objective: LO 14-5



14) Under the incremental method of allocating common costs

- A) the parties are interested in being viewed as primary users.
- B) each party bears a proportionate share of the total costs in relation to their individual stand-alone costs.
- C) fairness and equity are emphasized.
- D) there is a disincentive to be titled the primary user.
- E) no ranking of users is required.

Answer: D

Diff: 1 Type: MC

Skill: Remember

Objective: LO 14-5

*Answer the following question(s) using the information below:*

The Sturgeon Bay Corporation currently uses a manufacturing facility costing \$400,000 per year; 80% of the facility's capacity is currently being used. A start-up business has proposed a plan that would utilize the other 20% of the facility and increase the overall costs of maintaining the space by 5%.

15) If the stand-alone method were used, what amount of cost would be allocated to the start-up business?

- A) \$20,000
- B) \$100,000
- C) \$80,000
- D) \$84,000
- E) \$67,200

Answer: D

Explanation: D)  $\$400,000 \times 1.05 = \$420,000$ ;  $\$420,000 \times .2 = \$84,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-5

16) If the incremental method were used, what amount of cost would be allocated to the start-up business?

- A) \$20,000
- B) \$100,000
- C) \$80,000
- D) \$84,000
- E) \$21,000

Answer: A

Explanation: A)  $\$400,000 \times 0.05 = \$20,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-5

*Answer the following questions using the information below:*

The Salmon Bay Corporation currently uses a manufacturing facility costing \$200,000 per year; 80% of the facility's capacity is currently being used. A start-up business has proposed a plan that would utilize the other 20% of the facility and increase the overall costs of maintaining the space by 5%.

17) If the stand-alone method were used, what amount of cost would be allocated to the start-up business?

- A) \$40,000
- B) \$50,000
- C) \$10,000
- D) \$42,000

Answer: D

Explanation: D)  $\$200,000 \times 1.05 = \$210,000$ ;  $\$210,000 \times .2 = \$42,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-5

18) If the incremental method were used, what amount of cost would be allocated to the start-up business?

- A) \$10,000
- B) \$50,000
- C) \$40,000
- D) \$42,000

Answer: A

Explanation: A)  $\$200,000 \times 0.05 = \$10,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 14-5

19) Hunt Company and Indio Company are noncompeting lines of business and use a common database for marketing purposes. The variable costs associated with accessing the database are readily identifiable and kept in separate cost pools that are charged to each user. The fixed costs of maintaining the database, however, cannot be identified by user on a cause-and-effect basis. These fixed costs for the next year are budgeted at \$55,000. If Hunt does not use the database, the fixed costs to Indio are \$48,000. An outside vendor offers to provide Hunt access to a comparable database for a fixed fee of \$60,000 per year plus variable costs of accessing the database. The same vendor offers to provide Indio access to that database for a fixed fee of \$20,000 per year plus variable costs of accessing the database.

**Required:**

Compute how much of the \$55,000 fixed costs of maintaining the database are charged to by each user:

- a. Under the stand-alone allocation method.
- b. Under the incremental allocation method, assuming Hunt Company is regarded as the primary user.

**Answer:**

- a. Total individual stand-alone costs =  $\$60,000 + \$20,000 = \$80,000$

Allocated to Hunt =  $(\$60,000/\$80,000) \times \$55,000 = \$41,250$

Allocated to Indio =  $(\$20,000/\$80,000) \times \$55,000 = \$13,750$

- b. Hunt, the primary party, bears \$48,000.

Indio, the incremental party, bears  $\$55,000 - \$48,000 = \$7,000$

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-5

20) The Maintenance Department has been servicing Gizmo Production for four years. Beginning next year, the company is adding a Scrap-Processing Department to recycle the materials from Gizmo Production. As a result, maintenance costs are expected to increase from \$480,000 per year to \$500,000 per year. The Scrap-Processing Department will use 25% of the maintenance efforts.

**Required:**

- a. Using the stand-alone cost-allocation method, identify the amount of maintenance cost that will be allocated to Gizmo Production and the Scrap-Processing Department next year.

- b. Using the incremental cost-allocation method, identify the amount of maintenance cost that will be allocated to Gizmo Production and the Scrap-Processing Department next year.

**Answer:**

- a. Gizmo Production =  $\$500,000 \times 0.75 = \$375,000$

Scrap-Processing Department =  $\$500,000 \times 0.25 = \$125,000$

- b. Gizmo Production would receive \$480,000.

Scrap-Processing Department would receive \$20,000, the incremental amount

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-5

21) John Ebert, a graduating student at a university in Calgary, received an invitation to visit a prospective employer in Halifax. A few days later, he received an invitation from a prospective employer in Toronto. He decided to combine his visits, travelling from Calgary to Halifax, Halifax to Toronto, and Toronto to Calgary.

Ebert received job offers from both companies. On his return, he decided to accept the offer in Toronto. He was puzzled as to how to allocate his travel costs between the two employers. He gathered the following data:

Regular Round-Trip Fares with No Stopovers

Calgary to Halifax	\$1,500
Calgary to Toronto	\$1,200

Ebert paid \$1,900 for his three-leg flight (Calgary to Halifax, Halifax to Toronto, Toronto to Calgary). In addition, he paid \$30 for a limousine from his home to Calgary Airport and another \$30 for a limousine from Calgary Airport to his home when he returned.

Required:

- a. Allocate the \$1,900 airfare between the employers in Halifax and Toronto using both the stand-alone and incremental methods?
- b. How would you allocate the \$60 limousine fare?

Answer:

1. Allocation of the \$1,900 airfare: Alternative approaches include:

a. The stand-alone cost allocation method. This method would allocate the air fare on the basis of each user's percentage of the total of the individual stand-alone costs:

$$\begin{array}{rcl} \text{Halifax employer } \$1,500/(\$1,500 + \$1,200) \times \$1,900 = & \$1,056 \\ \text{Toronto employer } \$1,200/(\$1,500 + \$1,200) \times \$1,900 = & \underline{844} \\ & \underline{\$1,900} \end{array}$$

Advocates of this method often emphasize an equity or fairness rationale.

b. The incremental cost allocation method. This requires the choice of a primary party and an incremental party.

If the Halifax employer is the primary party, the allocation would be:

$$\begin{array}{rcl} \text{Halifax employer } & \$1,500 \\ \text{Toronto employer } & \underline{400} \\ & \underline{\$1,900} \end{array}$$

One rationale is Ernst was planning to make the Halifax trip and the Toronto stop was added subsequently. Some students have suggested allocating as much as possible to the Halifax employer since Ernst was not joining them.

If the Toronto employer is the primary party, the allocation would be:

$$\begin{array}{rcl} \text{Toronto employer } & \$1,200 \\ \text{Halifax employer } & \underline{700} \\ & \underline{\$1,900} \end{array}$$

One rationale is that the Toronto employer is the successful recruiter and presumably receives more benefits from the recruiting expenditures.

2. A simple approach is to split the \$60 equally between the two employers. The limousine costs at the Vancouver end are not a function of distance traveled on the plane.

Another approach is to add the \$60 to the \$1,900 and repeat requirement 1:

a. Stand-alone cost allocation: Halifax employer = \$1,084; Toronto employer = \$876.

b. Incremental cost allocation: Halifax employer primary = \$1,560; Toronto employer = \$400

Toronto employer primary = \$1,260; Halifax employer = \$700

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-5

22) The Product Data Center has been servicing the Struble Production Casting Department for five years. Beginning next year, the company is adding a Production Molding Department to compliment the materials produced by the Struble Production Casting Department. As a result, data center costs are expected to increase from \$700,000 per year to \$800,000 per year. The Production Molding Department will use 20% of the data center efforts.

Required:

- a. Using the stand-alone cost-allocation method, identify the amount of data center cost that will be allocated to Struble Production Casting and the Production Molding Department next year.
- b. Using the incremental cost allocation method, identify the amount of data center cost that will be allocated to Struble Production Casting and the Production Molding Department next year.

Answer:

- a. Struble Production Casting Department =  $\$800,000 \times 0.80 = \$640,000$   
Production Molding =  $\$800,000 \times 0.20 = \$160,000$

- b. Struble Production Casting Department would receive \$700,000.  
Production Molding Department would receive \$100,000, the incremental amount.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 14-5

23) John Peters is drafting the provisions of a cost-plus contract and is concerned with ironing out any possible misunderstandings during the life of the contract. What advice can you provide to reduce contract disputes over reimbursement amounts based on costs?

Answer: Disputes can be reduced by making the cost allocation rules as explicit as possible and in writing. These rules should include details such as the allowable cost items, the acceptable cost-allocation bases, and how differences between budgeted and actual costs are to be accounted for.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 14-5

24) What is a "common cost"? What are two methods that a manager can use to allocate common costs to two or more users?

Answer: A common cost is the costs of a cost object that is shared by two or more users.

Two ways to allocate common costs would be the stand-alone method and the incremental method.

The stand-alone method uses information pertaining to each user of the cost object to determine the cost allocation weights.

The incremental method ranks individual users of the cost object and allocates common costs first to the primary user, and then to the other incremental users.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 14-5