

2. Bruno Company is a Rhode Island company that sells a branded product regionally to retail customers in New England. It normally sells its product for \$30 per unit; however, it has received a one-time offer from a private-brand company on the West Coast to buy 1,000 units at \$19 per unit. Even though the company has excess capacity to produce the units, the President of the company immediately rejected the offer; however, the chief accountant stated that it might be a profitable opportunity for the company, even though \$19 is below its unit cost of \$21, calculated as follows:

| | |
|---|----------------|
| Direct materials | \$ 9.00 |
| Direct labor | 5.00 |
| Variable overhead | 4.00 |
| Depreciation & other fixed overhead | 3.00 |
| Total unit cost | <u>\$21.00</u> |

Also, the special order will save \$1 per unit in packaging costs since the product will be bulk packaged instead of being individually packaged. Calculate the amount of profit or loss per unit if Bruno accepts the special order.

- \$2 loss
 - \$1 loss
 - \$2 profit
 - \$1 profit
3. Sitro, LTD had been making a component for one of its products, but is now considering outsourcing the component to a Chinese company, which has offered to sell an unlimited quantity of components for \$6 per unit. If Sitro outsources, it could shut down a whole department and rent the building for \$2,000 per month. The cost of making the component is \$5 per unit, which includes \$1.50 of fixed costs, of which only \$1.00 per unit can be avoided if the department is shut down. Sitro currently produces about 1,000 units per month. What is the cost advantage or disadvantage of per unit of outsourcing the component?
- \$1.00 disadvantage
 - \$1.50 disadvantage
 - \$1.00 advantage
 - \$0.50 advantage
4. Mitrex Company makes a semi-finished machine component for the heavy equipment industry that has a unit contribution margin of \$250 to Mitrex. A major customer has been purchasing 100 units per month from Mitrex for many years, but has indicated that it would prefer to purchase them already machined to its specifications. It has offered to pay an additional \$50 per unit for the finished units. To meet those specifications, Mitrex would have to rent additional equipment at a cost of \$2,000 per month and incur labor and other direct costs of \$15 per unit. Calculate the per-unit advantage or disadvantage of further processing.
- \$15 advantage
 - \$35 advantage
 - \$50 advantage
 - \$15 disadvantage
5. Giko, LTD makes three products (Abba, Babba, and Cabba), all of which use a very rare ingredient called, Mecogen. Giko can purchase only 500 ounces of Mecogen per month from its East Asian source. Below are data for the three products:

| | Abba | Babba | Cabba |
|---------------------------------|------|-------|-------|
| Unit selling price | \$80 | \$65 | \$100 |
| Unit variable costs | 45 | 40 | 60 |
| Unit contribution margin | 35 | 25 | 40 |
| Mecogen (ounces per unit) | 10 | 15 | 20 |

How should Giko allocate the 500 ounces of Mecogen assuming it can sell unlimited quantities of all three produces?

- All 500 ounces should be allocated to Abba
- All 500 ounces should be allocated to Babba
- All 500 ounces should be allocated to Cabba
- None of the above

LO1, 2, 3 E4-20. Special Order

Nature's Garden, a new restaurant situated on a busy highway in Pomona, California, specializes in a chef's salad selling for \$9. Daily fixed costs are \$1,200, and variable costs are \$5 per meal. With a capacity of 800 meals per day, the restaurant serves an average of 750 meals each day.

Required

- Determine the current average cost per meal.
- A busload of 30 Girl Scouts stops on its way home from the San Bernardino National Forest. The leader offers to bring them in if the scouts can all be served a meal for a total of \$180. The owner refuses, saying he would lose \$0.60 per meal if he accepted this offer. How do you think the owner arrived at the \$0.60 figure? Comment on the owner's reasoning.
- A local businessman on a break overhears the conversation with the leader and offers the owner a one-year contract to feed 300 of the businessman's employees one meal each day at a special price of \$5.50 per meal. Should the restaurant owner accept this offer? Why or why not?

LO1, 2, 3 E4-21. Special Order: High-Low Cost Estimation

SafeRide, Inc. produces air bag systems that it sells to North American automobile manufacturers. Although the company has a capacity of 300,000 units per year, it is currently producing at an annual rate of 180,000 units. SafeRide, Inc. has received an order from a German manufacturer to purchase 60,000 units at \$9.00 each. Budgeted costs for 180,000 and 240,000 units are as follows:

| | 180,000 Units | 240,000 Units |
|----------------------------------|---------------|---------------|
| Manufacturing costs | | |
| Direct materials | \$ 450,000 | \$ 600,000 |
| Direct labor | 315,000 | 420,000 |
| Factory overhead | 1,215,000 | 1,260,000 |
| Total | 1,980,000 | 2,280,000 |
| Selling and administrative | 765,000 | 780,000 |
| Total | \$2,745,000 | \$3,060,000 |
| Costs per unit | | |
| Manufacturing | \$11.00 | \$ 9.50 |
| Selling and administrative | 4.25 | 3.25 |
| Total | \$15.25 | \$12.75 |

Sales to North American manufacturers are priced at \$20 per unit, but the sales manager believes the company should aggressively seek the German business even if it results in a loss of \$3.75 per unit. She believes obtaining this order would open up several new markets for the company's product. The general manager commented that the company cannot tighten its belt to absorb the \$225,000 loss ($\$3.75 \times 60,000$) it would incur if the order is accepted.

Required

- Determine the financial implications of accepting the order.
- How would your analysis differ if the company were operating at capacity? Determine the advantage or disadvantage of accepting the order under full-capacity circumstances.

LO1, 2, 3 E4-22. Outsourcing (Make-or-Buy) Decision

HEWLETT-PACKARD
(HPQ)



SANMINA-SCI (SANM)

Assume a division of **Hewlett-Packard** currently makes 10,000 circuit boards per year used in producing diagnostic electronic instruments at a cost of \$34 per board, consisting of variable costs per unit of \$24 and fixed costs per unit of **\$10**. Further assume **Sanmina-SCI** offers to sell Hewlett-Packard the 10,000 circuit boards for \$34 each. If Hewlett-Packard accepts this offer, the facilities currently used to make the boards could be rented to one of Hewlett-Packard's suppliers for \$27,000 per year. In addition, \$5 per unit of the fixed overhead applied to the circuit boards would be totally eliminated.

Required

Should HP outsource this component from Samina-SCI? Support your answer with relevant cost calculations.

During the month, 9,000 units of product were transferred to finished goods inventory; on March 31, 3,500 units were in process, 10 percent converted. The company uses weighted average costing.

Required

- Determine the cost of goods transferred to finished goods inventory.
- Determine the cost of the ending work-in-process inventory.
- What was the total cost of the beginning work-in-process inventory plus the current manufacturing costs?

M5-19.^A Absorption and Variable Costing; Inventory Valuation

Boxtel, Inc., has a highly automated assembly line that uses very little direct labor. Therefore, direct labor is part of variable overhead. For October, assume that it incurred the following unit costs:

| | |
|-------------------------|-------|
| Direct materials | \$250 |
| Variable overhead | 220 |
| Fixed overhead | 80 |

The 100 units of beginning inventory for October had an absorption costing value of \$45,000 and a variable costing value of \$38,000. For October, assume that Boxtel, Inc. produced 500 units and sold 540 units.

Required

Compute Boxtel's October amount of ending inventory under both absorption and variable costing if the FIFO inventory method was used.

M5-20.^A Absorption and Variable Costing; Cost of Goods Sold

Use data from Mini Exercise 5-19.^A

Required

Compute Boxtel's October Cost of Goods Sold using both the variable and absorption costing methods.

EXERCISES

E5-21. Analyzing Activity in Inventory Accounts

Selected data concerning operations of Cascade Manufacturing Company for the past fiscal year follow:

LO2, 4



| | |
|--|-----------|
| Raw materials used | \$400,000 |
| Total manufacturing costs charged to production during the year (includes raw materials, direct labor, and manufacturing overhead applied at a rate of 60 percent of direct labor costs) | 731,000 |
| Cost of goods available for sale | 876,000 |
| Selling and general expenses | 40,000 |

| | Inventories | |
|-----------------------|-------------|-----------|
| | Beginning | Ending |
| Raw materials | \$70,000 | \$ 80,000 |
| Work-in-process | 85,000 | 30,000 |
| Finished goods | 90,000 | 110,000 |

Required

Determine each of the following:

- Cost of raw materials purchased
- Direct labor costs charged to production
- Cost of goods manufactured
- Cost of goods sold

| | |
|--|-----------|
| Costs assigned to processing | |
| Raw materials (one unit of raw materials for each unit of product started) | \$142,900 |
| Manufacturing supplies used | 18,000 |
| Direct labor costs incurred | 53,000 |
| Supervisors' salaries | 12,000 |
| Other production labor costs | 14,000 |
| Depreciation on equipment | 6,000 |
| Other production costs | 18,000 |

Additional information follows:

- Minot uses weighted average costing and applies manufacturing overhead to Work-in-Process at the rate of 100 percent of direct labor cost.
- Ending inventory in the Processing Department consists of 4,500 units that are one-third converted.
- Beginning inventory contained 2,000 units, one-half converted, with a cost of \$27,300 (\$17,300 for materials and \$10,000 for conversion).

Required

- Prepare a cost of production report for the Processing Department for November.
- Prepare an analysis of all changes in Work-in-Process.

JIF
J.M. SMUCKER
COMPANY (SJM)

LO5 P5-39. Weighted Average Process Costing

Assume that JIF, which is part of J.M. Smucker Company, processes its only product, 12-ounce jars of peanut butter, in a single process and uses weighted average process costing to account for inventory costs. All materials are added at the beginning of production. Assume the following inventory, production, and cost data are provided for September 2014:

| | |
|---|---------------|
| Production data | |
| Beginning inventory (25% converted) | 220,000 units |
| Units started | 650,000 units |
| Ending inventory (50% converted) | 180,000 units |

| | |
|--|-----------|
| Manufacturing costs | |
| Beginning inventory in process: | |
| Materials cost | \$154,000 |
| Conversion cost | 88,000 |
| Raw materials cost added at beginning of process | 739,800 |
| Direct labor cost incurred | 410,000 |
| Manufacturing overhead applied | 333,600 |

Required

- Prepare a cost of production report for September.
- Prepare a statement of cost of goods manufactured for September.

LO5 P5-40. Weighted Average Process Costing with Error Correction

Horizon Manufacturing Company began operations on December 1. On December 31 a new accounting intern was assigned the task of calculating and costing ending inventories.

The intern estimated that the ending work-in-process inventory was 40 percent complete as to both materials and conversion, resulting in 4,000 equivalent units of materials and conversion. The ending work-in-process was then valued at \$80,000, including \$40,000 for materials and \$40,000 for conversion. A subsequent review of the intern's work revealed that although the materials portion of the ending inventory was correctly estimated to be 40 percent complete, the units in ending inventory, on average, were only 20 percent complete as to conversion.

Required

- Determine the number of units in the ending inventory.
- How many equivalent units of conversion were in the ending inventory?
- What cost per unit did the intern calculate for conversion?
- Assuming 9,000 units were completed during the month of December, determine the correct cost per equivalent unit. *Hint:* Find the total conversion costs in process.

Filling an order for a batch of 50 fireplace inserts (each insert weighing 150 pounds) required the following:

- Three batch moves
- Two sets of inspections
- Drilling five holes in each unit
- Completing 80 inches of welds on each unit
- Thirty minutes of shaping for each unit
- One hour of assembly per unit

Required

Determine the activity cost of converting the raw materials into 50 fireplace inserts.

M6-16. Two-Stage ABC for Manufacturing

Detroit Foundry, a large manufacturer of heavy equipment components, has determined the following activity cost pools and cost driver levels for the year:

LO2



| Activity Cost Pool | Activity Cost | Activity Cost Driver |
|-----------------------------|---------------|-------------------------|
| Machine setup | \$660,000 | 12,000 setup hours |
| Material handling | 100,000 | 2,000 tons of materials |
| Machine operation | 450,000 | 10,000 machine hours |

The following data are for the production of single batches of two products, C23 Cams and U2 Shafts during the month of August:

| | C23 Cams | U2 Shafts |
|---------------------------------|----------|-----------|
| Units produced | 500 | 300 |
| Machine hours | 4 | 5 |
| Direct labor hours | 200 | 400 |
| Direct labor cost | \$5,000 | \$10,000 |
| Direct materials cost | \$30,000 | \$20,000 |
| Tons of materials | 12.5 | 8 |
| Setup hours | 3 | 7 |

Required

Determine the unit costs of C23 Cams and U2 Shafts using ABC.

M6-17. Two-Stage ABC for Manufacturing

Assume **Sherwin-Williams** Company, a large paint manufacturer, has determined the following activity cost pools and cost driver levels for the latest period:

LO2



**SHERWIN-WILLIAMS
(SHW)**

| Activity Cost Pool | Activity Cost | Activity Cost Driver |
|-----------------------------|---------------|----------------------|
| Machine setup | \$975,000 | 2,500 setup hours |
| Material handling | 830,000 | 5,000 material moves |
| Machine operation | 180,000 | 20,000 machine hours |

The following data are for the production of single batches of two products, Mirlite and Subdue:

| | Mirlite | Subdue |
|---------------------------------|-----------|-----------|
| Gallons produced | 50,000 | 30,000 |
| Direct labor hours | 400 | 250 |
| Machine hours | 800 | 250 |
| Direct labor cost | \$10,000 | \$7,500 |
| Direct materials cost | \$350,000 | \$150,000 |
| Setup hours | 15 | 12 |
| Material moves | 60 | 35 |

Required

Determine the batch and unit costs per gallon of Mirlite and Subdue using ABC.

E6-20. Calculating Manufacturing Overhead Rates**L03**

Glassman Company, accumulated the following data for 2014:

| | |
|---|--------------|
| Milling Department manufacturing overhead | \$362,000 |
| Finishing Department manufacturing overhead | \$130,000 |
| Machine hours used | |
| Milling Department | 10,000 hours |
| Finishing Department | 2,000 hours |
| Labor hours used | |
| Milling Department | 1,000 hours |
| Finishing Department | 1,000 hours |

Required

- Calculate the plantwide manufacturing overhead rate using machine hours as the allocation base.
- Calculate the plantwide manufacturing overhead rate using direct labor hours as the allocation base.
- Calculate department overhead rates using machine hours in Milling and direct labor hours in Finishing as the allocation bases.
- Calculate department overhead rates using direct labor hours in Milling and machine hours in Finishing as the allocation bases.
- Which of these allocation systems seems to be the most appropriate? Explain.

E6-21. Calculating Activity-Based Costing Overhead Rates**L02, 3, 4**

Assume that manufacturing overhead for Glassman Company in the previous exercise consisted of the following activities and costs:

| | |
|--|------------------|
| Setup (1,000 setup hours) | \$146,000 |
| Production scheduling (400 batches) | 60,000 |
| Production engineering (60 change orders) | 90,000 |
| Supervision (2,000 direct labor hours) | 56,000 |
| Machine maintenance (12,000 machine hours) | 96,000 |
| Total activity costs | \$448,000 |

The following additional data were provided for Job 845:

| | |
|---|-----------------|
| Direct materials costs | \$8,000 |
| Direct labor cost (5 Milling direct labor hours; 35 Finishing direct labor hours) | \$1,000 |
| Setup hours | 5 hours |
| Production scheduling | 1 batch |
| Machine hours used (25 Milling machine hours; 5 Finishing machine hours) | 30 hours |
| Production engineering | 3 change orders |

Required

- Calculate the cost per unit of activity driver for each activity cost category.
- Calculate the cost of Job 845 using ABC to assign the overhead costs.
- Calculate the cost of Job 845 using the plantwide overhead rate based on machine hours calculated in the previous exercise.
- Calculate the cost of Job 845 using a machine hour departmental overhead rate for the Milling Department and a direct labor hour overhead rate for the Finishing Department (see E6-20).

E6-22. Activity-Based Costing and Conventional Costs Compared**L02, 3, 4**

Hickory Grill Company manufactures two types of cooking grills: the Gas Cooker and the Charcoal Smoker. The Cooker is a premium product sold in upscale outdoor shops; the Smoker is sold in major discount stores. Following is information pertaining to the manufacturing costs for the current month.

MULTIPLE CHOICE

Multiple Choice Answers
1. d 2. a 3. b 4. c 5. b

1. In a value chain analysis:
 - a. The links of the chain are the various entities beginning with the producers of raw materials and ending with the final customer
 - b. Processes are collections of related activities intended to achieve a common purpose, such as procurement or production
 - c. Activities are the units of work that take place within the various processes, such as moving products from one work station to another
 - d. All of the above
2. In a cost-based pricing model, the markup percentage is determined by an equation that:
 - a. Has the cost base in the denominator and any remaining costs plus the desired profit in the numerator.
 - b. Has variable costs plus fixed costs in the denominator and total profit in the numerator
 - c. Always has only variable costs in the numerator
 - d. Always has desired profit as part of the denominator
3. Brown manufacturing makes profits with varying pricing structures, but it wants to determine the minimum markup percentage for all products based on manufacturing costs that will ensure that it does not fall below break-even point. It has estimated the following costs for the coming year for its planned production of all products.

| | |
|--|-----------|
| Variable manufacturing costs | \$600,000 |
| Fixed manufacturing costs | 200,000 |
| Selling expenses | 100,000 |
| Administrative expenses | 150,000 |

The markup percentage required for Brown Company to break even is:

- a. 320%
 - b. 31.25%
 - c. 75%
 - d. Cannot be determined unless desired profit is known
4. Electronics, Inc. is considering producing a new MP3 player that will offer several new features, including wireless earphones and wireless download of music and videos from any computer to the device. After much market research, it has determined that the appropriate target price for the new product is \$90. To achieve its normal minimum profit margin of 20 percent, Electronics must be able to produce the product at a maximum total cost of:
 - a. \$108
 - b. \$70
 - c. \$72
 - d. \$18
5. Orange, Inc. produces electronic devices such as computers and cell phones. It has recently introduced a digital reader, called the e-pad, but realizes that to compete effectively in the future, it must be able to lower the cost of production and the selling price. The current cost per unit for producing the e-pad is \$138, and Orange is estimating inflation on e-pad components and supplies purchased externally to be 1.5 percent in the coming year. In the most recent period, these items had a cost of \$74. Despite these cost increases, Orange has adopted a Kaizen cost improvement model that targets a 5 percent cost decrease. Orange's Kaizen cost target (rounded to two decimal places) for the e-pad is:
 - a. \$131.11
 - b. \$132.15
 - c. \$133.07
 - d. \$130.05

2. Syracuse Distribution's sales budget for the **first** quarter follows:

| | |
|---------------|-----------|
| January | \$250,000 |
| February..... | 300,000 |
| March..... | 290,000 |

All sales are on account (credit) with 50 percent collected in the month of sale, 30 percent collected in the month after sale, and 20 percent collected in the second month after sale. There are no uncollectable accounts. The March cash receipts are:

- \$140,000
 - \$235,000
 - \$285,000
 - None of the above
3. Refer to question 2 and determine the accounts receivable at the end of March:
- \$147,000
 - \$205,000
 - \$235,000
 - \$285,000
4. Presented is selected second quarter budget data for the Arnold Company

| | Sales |
|-------------|--------------|
| April | 20,000 units |
| May | 30,000 units |
| June | 36,000 units |

Additional information:

- Each unit of finished product requires three pounds of raw materials.
- Arnold maintains ending finished goods inventories equal to 20 percent of the following month's budgeted sales.
- Arnold maintains raw materials inventories equal to 25 percent of the following month's budgeted production.
- April 1 inventories are in line with Arnold's inventory policy.

Arnold's budgeted purchases (in pounds) for April is:

- 66,000 pounds
 - 72,900 pounds.
 - 89,400 pounds
 - None of the above
5. Presented is additional information for the Arnold Company (refer to question 4):
- Price per pound of raw materials \$20
 - Direct labor per unit of finished product 0.40 hours at \$25 per hour
 - Total monthly factory overhead \$200,000 + \$10 per direct labor hour

Arnold's total manufacturing cost budget for April is:

- \$880,000
- \$1,680,000
- \$1,828,000
- \$1,966,000

DISCUSSION QUESTIONS

- Q9-1.** What are the primary phases in the planning and control cycle?
- Q9-2.** Does budgeting require formal or informal planning? What are some advantages of this style of management?

Unit costs:

| | | | |
|--|------|----|----------|
| Direct materials: | | | |
| Wood: 11 square feet at \$5 | \$55 | | |
| Hardware kits (screws, etc) | 5 | \$ | 60 |
| | | | |
| Direct labor 0.5 hours at \$26 per hour | | | 13 |
| Variable overhead, per unit | | | 5 |
| | | | |
| Total variable costs per unit | | \$ | 78 |
| | | | |
| Fixed costs per month (rent, utilities, supervision) | | | \$50,000 |

Management plans to produce 7,000 units in April 2014.

Required

Prepare a manufacturing cost budget for April 2014.

EXERCISES

E9-23. Activity-Based Budget**L02**

Macon Industries has the following budget information available for February:

| | |
|------------------------|--|
| Units manufactured | 20,000 |
| Factory administration | \$45,000 |
| Assembly | $\frac{1}{2}$ hour per unit \times \$8 |
| Direct materials | 2 pounds per unit \times \$3 |
| Inspection | \$200 per batch of 1,000 units |
| Manufacturing overhead | \$3 per unit |
| Product development | \$15,000 |
| Setup cost | \$10 per batch of 1,000 units |

Required

Use activity based costing to prepare a manufacturing cost budget for February. Clearly distinguish between unit, batch, and facility-level costs.

E9-24. Product and Department Budgets Using Activity-Based Approach**L02**

The following data are from the general records of the Loading Department of Bowman Freight Company for November.

- Cleaning incoming trucks, 20 minutes.
- Obtaining and reviewing shipping documents for loading truck and instructing loaders, 30 minutes.
- Loading truck, 1 hour and 30 minutes.
- Cleaning shipping dock and storage area after each loading, 10 minutes.
- Employees perform both cleaning and loading tasks and are currently averaging \$18 per hour in wages and benefits.
- The supervisor spends 10 percent of her time overseeing the cleaning activities; 60 percent overseeing various loading activities; and the remainder of her time making general plans and managing the department. Her current salary is \$4,500 per month.
- Other overhead of the department amounts to \$9,000 per month, 20 percent for cleaning and 80 percent for loading.

Required

Prepare an activities budget for cleaning and loading in the Loading Department for November, assuming 20 working days and the loading of an average of 14 trucks per day.

E9-25. Activity-Based Budgeting**L02**

St. Mary's Hospital is preparing its budget for the coming year. It uses an activity-based approach for all costs except physician care. Its emergency room has three activity areas with cost drivers as follows:

MULTIPLE CHOICE

1. Presented is an abbreviated performance report for the month of July:

| | Actual | Budget | Variance |
|---------------------------------|------------------|------------------|-------------------|
| Units..... | 5,500 | 5,000 | |
| Costs: | | | |
| Direct materials | \$ 45,500 | \$ 40,000 | \$ 5,500 U |
| Direct labor..... | 181,500 | 150,000 | 31,500 U |
| Variable factory overhead | 208,000 | 160,000 | 48,000 U |
| Fixed factory overhead | 125,000 | 120,000 | 5,000 U |
| Total costs..... | <u>\$560,000</u> | <u>\$470,000</u> | <u>\$90,000 U</u> |

The total flexible budget variance is:

- \$55,000 Unfavorable
 - \$90,000 Unfavorable
 - \$50,000 Favorable
 - \$55,000 Favorable
2. The following additional information is available for the materials costs in question 1:
- Standard cost per unit produced: 2 liters @ \$4.00 per liter
 - Actual use of raw materials 13,000 liters @ \$3.50 per liter

The materials price and materials quantify variances are:

- \$5,500 F materials price variance and \$8,000 U materials **quantity** variance
 - \$6,500 F materials price variance and \$8,000 U materials **quantity** variance
 - \$6,500 F materials price variance and \$12,000 U materials **quantity** variance
 - None of the above
3. The following additional information is available for the labor costs in question 1.
- Standard cost per unit of product 1.5 direct labor hours @ \$20 per labor hour
 - Actual use of direct labor is 8,250 hours @ \$22 per hour
- The labor rate and the labor efficiency variances are:
- \$16,500 U labor rate variance and \$0 labor efficiency variance
 - \$16,500 F labor rate variance and \$0 labor efficiency variance
 - \$16,500 U labor rate variance and \$15,000 U labor efficiency variance
 - None of the above

4. The following additional information is available for the variable overhead costs in question 1:
- Standard cost per unit of product 2 liters of raw materials @ \$16 per liter
 - Actual use of raw materials was 13,000 liters and actual variable overhead was \$208,000

The variable overhead spending and variable overhead efficiency variances are:

- \$32,000 U spending and \$0 efficiency
 - \$32,000 U spending and \$16,000 U efficiency
 - \$16,000 U spending and \$32,000U efficiency
 - \$0 spending and \$32,000 U efficiency
5. Budgeted June sales of the Tack Shop include 100 western saddles at \$650 each. Actual sales were 90 saddles at \$725 each. The June sales price and sales volume variances for western saddles are:
- \$250 F sales price variance and \$10 U sales volume variance
 - \$6,750 F sales price variance and \$6,500 U sales volume variance
 - \$7,500 F sales price variance and \$6,500 U sales volume variance
 - None of the above

M10-17. Materials Variances**L03**

North Wind manufactures decorative weather vanes that have a standard materials cost of two pounds of raw materials at \$1.50 per pound. During September 5,000 pounds of raw materials costing \$1.75 per pound were used in making 2,400 weather vanes.

**Required**

Determine the materials price and quantity variance.

M10-18. Materials Variances**L03**

PEARLE VISION

Assume that **Pearle Vision** uses standard costs to control the materials in its made-to-order sunglasses. The standards call for 2 ounces of material for each pair of lenses. The standard cost per ounce of material is \$14. During July, the Santa Clara location produced 4,800 pairs of sunglasses and used 9,000 ounces of materials. The cost of the materials during July was \$14.50 per ounce, and there were no beginning or ending inventories.

Required

- Determine the flexible budget materials cost for the completion of the 4,800 pairs of glasses.
- Determine the actual materials cost incurred for the completion of the 4,800 pairs of glasses and compute the total materials variance.
- How much of the total variance was related to the price paid to purchase the materials?
- How much of the difference between the answers to requirements (a) and (b) was related to the quantity of materials used?

M10-19. Direct Labor Variances**L03**

NORTEL (NT)

Assume that **Nortel** manufactures specialty electronic circuitry through a unique photoelectronic process. One of the primary products, Model ZX40, has a standard labor time of 0.5 hour and a standard labor rate of \$13.00 per hour. During February, the following activities pertaining to direct labor for ZX40 were recorded:

| | |
|--------------------------------------|----------|
| Direct labor hours used | 2,180 |
| Direct labor cost | \$32,000 |
| Units of ZX40 manufactured | 4,600 |

Required

- Determine the labor rate variance.
- Determine the labor efficiency variance.
- Determine the total flexible budget labor cost variance.

M10-20. Significance of Direct Labor Variances**L03**

The Morgan Company's April budget called for labor costs of \$125,000. Because the actual labor costs were exactly \$125,000, management concluded there were no labor variances.

Required

Comment on management's conclusion.

M10-21. Variable Overhead Variances**L03**

SONY (SNE)

Assume that the best cost driver that **Sony** has for variable factory overhead in the assembly department is machine hours. During April, the company budgeted 480,000 machine hours and \$4,000,000 for its Texas plant's assembly department. The actual variable overhead incurred was \$4,180,000, which was related to 500,000 machine hours.

Required

- Determine the variable overhead spending variance.
- Determine the variable overhead efficiency variance.

M10-22. Sales Variances**L04**

Presented is information pertaining to an item sold by Winding Creek General Store:

KEY TERMS

| | | |
|-----------------------------------|---------------------------------|---------------------------------------|
| avoidable common costs, 390 | market value added (MVA), 401 | segment reports, 387 |
| balanced scorecard, 403 | net assets, 400 | strategic business segment, 386 |
| common segment costs, 388 | residual income, 400 | transfer price, 391 |
| dashboards, 406 | return on investment (ROI), 396 | weighted average cost of capital, 400 |
| direct segment fixed costs, 388 | segment income, 390 | |
| economic value added or EVA®, 400 | segment margin, 388 | |

MULTIPLE CHOICE

Multiple Choice Answers
1. c 2. d 3. a 4. c 5. a

1. Northern Communications, Inc. has two divisions (Individual and Business) and has the following information available for the current year:

| | |
|--|-------------|
| Sales revenue—Individual | \$3,000,000 |
| Sales revenue—Business | 5,000,000 |
| Variable costs—Individual | 1,200,000 |
| Variable costs—Business | 2,250,000 |
| Direct fixed costs, Individual | 400,000 |
| Direct fixed costs, Business | 550,000 |
| Allocated fixed costs—Individual | 250,000 |
| Allocated fixed costs—Business | 350,000 |
| Unallocated common fixed costs | 150,000 |

Northern's Business segment income is

- a. \$2,400,000
b. \$2,200,000
c. \$1,850,000
d. \$1,765,250
2. Refer to the previous question. The following information is available for the Individual Division, which has two product lines (Land and Mobile):

| | |
|--|-------------|
| Sales revenue—Land | \$1,200,000 |
| Sales revenue—Mobile | 1,800,000 |
| Variable costs—Land | 680,000 |
| Variable costs—Mobile | 520,000 |
| Direct fixed costs—Land | 150,000 |
| Direct fixed costs—Mobile | 125,000 |
| Allocated fixed costs—Land | 100,000 |
| Allocated fixed costs—Mobile | 150,000 |
| Unallocated common fixed costs | 125,000 |

The product margin for Land is

- a. \$270,000
b. \$170,000
c. \$520,000
d. \$370,000
3. Varcore, Inc. is currently acquiring a key component from its sister company, Farcore, Inc. at a transfer price of \$10 per unit. Farcore's variable cost of purchasing the unit is \$4, and its fixed cost per unit is \$3 per unit. Farcore does not have any excess capacity and can sell all it makes to external customers at \$10 per unit. Varcore has been offered a price of \$9 per unit for the component from another vendor and is insisting that Farcore reduce its price to \$9. Which of the following statements below is false regarding this scenario?
- a. Varcore should not accept the outside offer because the variable cost of purchasing it inside is only \$4 per unit.

EXHIBIT 12.9 Analysis of Capital Expenditures Including Tax Effects: Straight-Line Depreciation

| | Predicted Cash Inflows (outflows) (A) | Year(s) of Cash Flows (B) | 12% Present Value Factor (C) | Present Value of Cash Flows (A) × (C) |
|--|--|---------------------------------|------------------------------------|--|
| Initial investment | | | | |
| Vehicle and equipment | \$(90,554) | 0 | 1.000 | \$ (90,554) |
| Inventory and other working capital | (4,000) | 0 | 1.000 | (4,000) |
| Operations | | | | |
| Annual taxable income without depreciation | 30,000 | 1–5 | 3.605 | 108,150 |
| Taxes on income (\$30,000 × 0.34) | (10,200) | 1–5 | 3.605 | (36,771) |
| Depreciation tax shield* | 5,614 | 1–5 | 3.605 | 20,238 |
| Disinvestment | | | | |
| Sale of vehicle and equipment | 8,000 | 5 | 0.567 | 4,536 |
| Inventory and other working capital | 4,000 | 5 | 0.567 | 2,268 |
| Net present value of all cash flows | | | | <u>\$ 3,867</u> |
| *Computation of depreciation tax shield: | | | | |
| Annual straight-line depreciation | \$16,511 | | | |
| Tax rate | × 0.34 | | | |
| Depreciation tax shield | <u>\$ 5,614</u> | | | |

EXHIBIT 12.10 Analysis of Capital Expenditures Including Tax Effects: DDB Depreciation

| | Predicted Cash Inflows (outflows) (A) | Year(s) of Cash Flows (B) | 12% Present Value Factor (C) | Present Value of Cash Flows (A) × (C) | |
|--|--|---------------------------------|---|--|-------------------------------|
| Initial investment | | | | | |
| Vehicle and equipment | \$(90,554) | 0 | 1.000 | \$ (90,554) | |
| Inventory and other working capital | 4,000 | 0 | 1.000 | (4,000) | |
| Operations | | | | | |
| Annual taxable income without depreciation | 30,000 | 1–5 | 3.605 | 108,150 | |
| Taxes on income (\$30,000 × 0.34) | (10,200) | 1–5 | 3.605 | (36,771) | |
| Depreciation tax shield* | | | | | |
| Year 1 | 12,315 | 1 | 0.893 | 10,997 | |
| Year 2 | 7,389 | 2 | 0.797 | 5,889 | |
| Year 3 | 4,434 | 3 | 0.712 | 3,157 | |
| Year 4 | 2,660 | 4 | 0.636 | 1,692 | |
| Year 5 | 1,270 | 5 | 0.567 | 720 | |
| Disinvestment | | | | | |
| Sale of vehicle and equipment | 8,000 | 5 | 0.567 | 4,536 | |
| Inventory and other working capital | 4,000 | 5 | 0.567 | 2,268 | |
| Net present value of all cash flows | | | | <u>\$ 6,084</u> | |
| *Computation of depreciation tax shield: | | | | | |
| | Depreciation Base [†] (A) | Annual Rate (B) | Annual Depreciation (C) = (A) × (B) | Tax Rate (D) | Tax Shield (E) = (C) × (D) |
| 1 . . . | \$90,554 | 2/5 | \$36,222 | 0.34 | \$12,315 |
| 2 . . . | 54,332 | 2/5 | 21,733 | 0.34 | 7,389 |
| 3 . . . | 32,599 | 2/5 | 13,040 | 0.34 | 4,434 |
| 4 . . . | 19,559 | 2/5 | 7,824 | 0.34 | 2,660 |
| 5 . . . | 11,735 | balance | 3,735 | 0.34 | 1,270 |

[†]The depreciation base is reduced by the amount of all previous depreciation. The annual rate is twice the straight-line rate. For simplicity, we depreciated the remaining balance in the fifth year and did not switch to straight-line depreciation when the straight-line amount exceeds the double-declining balance amount. This would happen in the fourth year, when $19,559 \div 2 = \$9,780$. Although the depreciable base excludes the predicted disposal value of \$8,000, under double declining balance depreciation, an asset is only depreciated down to its disposal value. Hence, Year 5 depreciation is computed as the \$11,735 depreciable base minus the \$8,000 disposal value.