|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Question Type | Difficulty | LO1: Direct and indirect costs | LO2: DM, DL, Manuf. overhead | LO3: Period and product costs | LO4: Variable, fixed, and mixed costs | LO5: High-low method | LO6: Income statement formats | LO7: Decision-making cost classifications | LO8: Least squares regression (App 2A) | Professional exam adapted |
|  | 1 | T/F | E |  |  |  |  |  |  |  | x |  |
|  | 2 | T/F | E |  |  |  |  |  |  |  | x |  |
|  | 3 | Conceptual M/C | E |  |  |  |  |  |  |  | x |  |
|  | 4 | Single Part M/C | H |  |  |  |  |  |  |  | x |  |
|  | 5 | Single Part M/C | H |  |  |  |  |  |  |  | x |  |
|  | 6 | Single Part M/C | H |  |  |  |  |  |  |  | x |  |
| APP02A-Ref1 | 7-11 | Multipart M/C | M-H |  |  |  |  | x |  |  | x |  |
| APP02A-Ref2 | 12-13 | Multipart M/C | M |  |  |  |  |  |  |  | x |  |
| APP02A-Ref3 | 14-15 | Multipart M/C | M |  |  |  |  |  |  |  | x |  |
|  | 16 | Problem | H |  |  |  |  | x |  |  | x |  |
|  | 17 | Problem | H |  |  |  |  | x |  |  | x |  |
|  | 18 | Problem | H |  |  |  |  |  |  |  | x |  |
|  | 19 | Problem | H |  |  |  |  |  |  |  | x |  |
|  | 20 | Problem | H |  |  |  |  |  |  |  | x |  |
|  | 21 | Problem | H |  |  |  |  |  |  |  | x |  |

Appendix 02A

Least-Squares Regression Computations

**True / False Questions**

|  |  |
| --- | --- |
| 1. | The R2 (i.e., R-squared) is a measure of the goodness-of-fit in least-squares regression.    True    False |

|  |  |
| --- | --- |
| 2. | When analyzing a mixed cost, you should always plot the data in a scattergraph, but it is particularly important to check the data visually on a scattergraph when the R2 from a least squares regression is low. A quick look at the scattergraph can reveal that there is little relation between the cost and the activity or that the relation is something other than a simple straight line.    True    False |

**Multiple Choice Questions**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3. | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a method of separating a mixed cost into its fixed and variable elements by fitting a line to the data that minimizes the sum of the squared errors.      |  |  | | --- | --- | | A. | Account analysis |  |  |  | | --- | --- | | B. | Scattergraph |  |  |  | | --- | --- | | C. | High-low |  |  |  | | --- | --- | | D. | Least-square regression | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4. | Your boss would like you to estimate the fixed and variable components of a particular cost. Actual data for this cost over four recent periods appear below.      Using the least-squares regression method, what is the cost formula for this cost?      |  |  | | --- | --- | | A. | Y = $0.00 + $7.55X |  |  |  | | --- | --- | | B. | Y = $110.44 + $2.70X |  |  |  | | --- | --- | | C. | Y = $103.38 + $3.00X |  |  |  | | --- | --- | | D. | Y = $113.35 + $0.89X | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5. | The management of Bandle Corporation would like for you to analyze their repair costs, which are listed below:      Management believes that repair cost is a mixed cost that depends on the number of machine-hours. Using the least-squares regression method, the estimates of the variable and fixed components of repair cost would be closest to:      |  |  | | --- | --- | | A. | $6.72 per machine-hour plus $55,230 per month |  |  |  | | --- | --- | | B. | $6.80 per machine-hour plus $54,679 per month |  |  |  | | --- | --- | | C. | $7.28 per machine-hour plus $51,389 per month |  |  |  | | --- | --- | | D. | $14.66 per machine-hour plus $101,993 per month | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 6. | Laborn Inc.'s inspection costs are listed below:      Management believes that inspection cost is a mixed cost that depends on the number of units produced. Using the least-squares regression method, the estimates of the variable and fixed components of inspection cost would be closest to:      |  |  | | --- | --- | | A. | $43.04 per unit plus $10,648 per month |  |  |  | | --- | --- | | B. | $34.63 per unit plus $2,089 per month |  |  |  | | --- | --- | | C. | $34.78 per unit plus $2,044 per month |  |  |  | | --- | --- | | D. | $36.00 per unit plus $1,714 per month | |

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|  | Donner Company would like to estimate the variable and fixed components of its maintenance costs and has compiled the following data for the last five months of operations. |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 7. | Using the high-low method of analysis, the estimated variable cost per labor hour for maintenance is closest to:      |  |  | | --- | --- | | A. | $0.83 |  |  |  | | --- | --- | | B. | $1.84 |  |  |  | | --- | --- | | C. | $1.30 |  |  |  | | --- | --- | | D. | $1.14 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8. | Using the high-low method of analysis, the estimated total fixed cost per month for maintenance is closest to:      |  |  | | --- | --- | | A. | $440 |  |  |  | | --- | --- | | B. | $407 |  |  |  | | --- | --- | | C. | $470 |  |  |  | | --- | --- | | D. | $0 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 9. | Using the least-squares regression method, the estimated variable cost per labor hour for maintenance is closest to:      |  |  | | --- | --- | | A. | $1.88 |  |  |  | | --- | --- | | B. | $1.52 |  |  |  | | --- | --- | | C. | $1.09 |  |  |  | | --- | --- | | D. | $1.96 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10. | Using the least-squares regression method, the estimated total fixed cost per month for maintenance is closest to:      |  |  | | --- | --- | | A. | $470 |  |  |  | | --- | --- | | B. | $416 |  |  |  | | --- | --- | | C. | $400 |  |  |  | | --- | --- | | D. | $378 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11. | Using the least-squares regression equation, the total maintenance cost for March is:      |  |  | | --- | --- | | A. | above the regression line. |  |  |  | | --- | --- | | B. | on the regression line. |  |  |  | | --- | --- | | C. | below the regression line. |  |  |  | | --- | --- | | D. | outside the relevant range. | |

|  |  |
| --- | --- |
|  | Recent maintenance costs of Gallander Corporation are listed below:      Management believes that maintenance cost is a mixed cost that depends on machine-hours. |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12. | Using the least-squares regression method, the estimate of the variable component of maintenance cost per machine-hour is closest to:      |  |  | | --- | --- | | A. | $1.85 |  |  |  | | --- | --- | | B. | $10.30 |  |  |  | | --- | --- | | C. | $1.67 |  |  |  | | --- | --- | | D. | $1.90 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 13. | Using the least-squares regression method, the estimate of the fixed component of maintenance cost per month is closest to:      |  |  | | --- | --- | | A. | $6,066 |  |  |  | | --- | --- | | B. | $7,244 |  |  |  | | --- | --- | | C. | $5,944 |  |  |  | | --- | --- | | D. | $7,130 | |

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|  | Cespedes Inc.'s inspection costs are listed below:      Management believes that inspection cost is a mixed cost that depends on units produced. |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 14. | Using the least-squares regression method, the estimate of the variable component of inspection cost per unit produced is closest to:      |  |  | | --- | --- | | A. | $5.40 |  |  |  | | --- | --- | | B. | $5.33 |  |  |  | | --- | --- | | C. | $5.43 |  |  |  | | --- | --- | | D. | $16.07 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 15. | Using the least-squares regression method, the estimate of the fixed component of inspection cost per month is closest to:      |  |  | | --- | --- | | A. | $6,983 |  |  |  | | --- | --- | | B. | $10,342 |  |  |  | | --- | --- | | C. | $10,527 |  |  |  | | --- | --- | | D. | $6,972 | |

**Essay Questions**

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| 16. | CPE for CPAs, Inc., provides continuing professional education for certified public accountants. The company is relatively new and management is seeking information regarding the company's cost structure. The following information has been gathered for the first six months of the current year:      **Required**:  a. Using the high-low method, estimate the variable cost per seminar and the total fixed cost per month. b. Using the least-squares regression method, estimate the variable cost per seminar and the total fixed cost per month. |

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| 17. | The management of Buff Sports Stadium believes that the number of sporting events each month is an measure of activity for total clean-up cost. Shown below are event figures and total clean up costs for the past four months:      **Required**:  a. Estimate Buff's cost formula for monthly clean-up cost using the high-low method. b. Estimate Buff's cost formula for monthly clean-up cost using the least-squares regression method. |

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| 18. | Sablan Inc. maintains a call center to take orders, answer questions, and handle complaints. The costs of the call center for a number of recent months are listed below:      Management believes that the cost of the call center is a mixed cost that depends on the number of calls taken.  **Required**:  Estimate the variable cost per call and fixed cost per month using the least-squares regression method. |

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| --- | --- |
| 19. | Below are cost and activity data for a particular cost over the last four periods. Your boss has asked you to analyze this cost so that management will have a better understanding of how this cost changes in response to changes in activity.      **Required**:  Using the least-squares regression method, estimate the cost formula for this cost. |

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| 20. | Escalona Printing Corp., a book printer, has provided the following data:      Management believes that the press setup cost is a mixed cost that depends on the number of titles printed. (A specific book that is to be printed is called a "title". Typically, thousands of copies will be printed of each title. Specific steps must be taken to setup the presses for printing each title-for example, changing the printing plates. The costs of these steps are the press setup costs.)  **Required**:  Estimate the variable cost per title printed and the fixed cost per month using the least-squares regression method. |

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| 21. | The management of Sambrano Corporation would like to better understand the behavior of the company's warranty costs. Those costs are listed below for a number of recent months:      Management believes that warranty cost is a mixed cost that depends on the number of product returns.  **Required**:  Estimate the variable cost per product return and the fixed cost per month using the least-squares regression method. |

Appendix 02A Least-Squares Regression Computations Answer Key

**True / False Questions**

|  |  |
| --- | --- |
| 1. | The R2 (i.e., R-squared) is a measure of the goodness-of-fit in least-squares regression.    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

|  |  |
| --- | --- |
| 2. | When analyzing a mixed cost, you should always plot the data in a scattergraph, but it is particularly important to check the data visually on a scattergraph when the R2 from a least squares regression is low. A quick look at the scattergraph can reveal that there is little relation between the cost and the activity or that the relation is something other than a simple straight line.    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

**Multiple Choice Questions**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3. | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a method of separating a mixed cost into its fixed and variable elements by fitting a line to the data that minimizes the sum of the squared errors.      |  |  | | --- | --- | | A. | Account analysis |  |  |  | | --- | --- | | B. | Scattergraph |  |  |  | | --- | --- | | C. | High-low |  |  |  | | --- | --- | | **D.** | Least-square regression | |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4. | Your boss would like you to estimate the fixed and variable components of a particular cost. Actual data for this cost over four recent periods appear below.      Using the least-squares regression method, what is the cost formula for this cost?      |  |  | | --- | --- | | A. | Y = $0.00 + $7.55X |  |  |  | | --- | --- | | **B.** | Y = $110.44 + $2.70X |  |  |  | | --- | --- | | C. | Y = $103.38 + $3.00X |  |  |  | | --- | --- | | D. | Y = $113.35 + $0.89X |   Using Microsoft Excel, the slope and intercept are:    Therefore, the cost formula is $110.44 per activity plus $2.70 per unit or: Y = $110.44 + $2.70X |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5. | The management of Bandle Corporation would like for you to analyze their repair costs, which are listed below:      Management believes that repair cost is a mixed cost that depends on the number of machine-hours. Using the least-squares regression method, the estimates of the variable and fixed components of repair cost would be closest to:      |  |  | | --- | --- | | A. | $6.72 per machine-hour plus $55,230 per month |  |  |  | | --- | --- | | **B.** | $6.80 per machine-hour plus $54,679 per month |  |  |  | | --- | --- | | C. | $7.28 per machine-hour plus $51,389 per month |  |  |  | | --- | --- | | D. | $14.66 per machine-hour plus $101,993 per month |   Using Microsoft Excel, the solution is: |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 6. | Laborn Inc.'s inspection costs are listed below:      Management believes that inspection cost is a mixed cost that depends on the number of units produced. Using the least-squares regression method, the estimates of the variable and fixed components of inspection cost would be closest to:      |  |  | | --- | --- | | A. | $43.04 per unit plus $10,648 per month |  |  |  | | --- | --- | | B. | $34.63 per unit plus $2,089 per month |  |  |  | | --- | --- | | **C.** | $34.78 per unit plus $2,044 per month |  |  |  | | --- | --- | | D. | $36.00 per unit plus $1,714 per month |   Using Microsoft Excel, the solution is: |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

|  |  |
| --- | --- |
|  | Donner Company would like to estimate the variable and fixed components of its maintenance costs and has compiled the following data for the last five months of operations. |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 7. | Using the high-low method of analysis, the estimated variable cost per labor hour for maintenance is closest to:      |  |  | | --- | --- | | A. | $0.83 |  |  |  | | --- | --- | | B. | $1.84 |  |  |  | | --- | --- | | C. | $1.30 |  |  |  | | --- | --- | | **D.** | $1.14 |   Variable cost = Change in cost ÷ Change in activity = $91 ÷ 80 labor hours = $1.1375 per labor hour |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 02-05 Analyze a mixed cost using a scattergraph plot and the high-low method.* |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8. | Using the high-low method of analysis, the estimated total fixed cost per month for maintenance is closest to:      |  |  | | --- | --- | | A. | $440 |  |  |  | | --- | --- | | **B.** | $407 |  |  |  | | --- | --- | | C. | $470 |  |  |  | | --- | --- | | D. | $0 |   Variable cost = Change in cost ÷ Change in activity = $91 ÷ 80 labor hours = $1.1375 per labor hour Fixed cost = Total cost - Variable cost Fixed cost = $623 - ($1.1375 per labor hour × 190 labor hours) = $406.875 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 02-05 Analyze a mixed cost using a scattergraph plot and the high-low method.* |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 9. | Using the least-squares regression method, the estimated variable cost per labor hour for maintenance is closest to:      |  |  | | --- | --- | | A. | $1.88 |  |  |  | | --- | --- | | B. | $1.52 |  |  |  | | --- | --- | | **C.** | $1.09 |  |  |  | | --- | --- | | D. | $1.96 |   The regression line is Y = 415.69 + 1.0942X and the R2 is 0.8432 Therefore, the variable cost per labor hour for maintenance is closest to $1.09. |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10. | Using the least-squares regression method, the estimated total fixed cost per month for maintenance is closest to:      |  |  | | --- | --- | | A. | $470 |  |  |  | | --- | --- | | **B.** | $416 |  |  |  | | --- | --- | | C. | $400 |  |  |  | | --- | --- | | D. | $378 |   The regression line is Y = 415.69 + 1.0942X and the R2 is 0.8432 Therefore, the fixed cost for maintenance is closest to $416. |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11. | Using the least-squares regression equation, the total maintenance cost for March is:      |  |  | | --- | --- | | A. | above the regression line. |  |  |  | | --- | --- | | B. | on the regression line. |  |  |  | | --- | --- | | **C.** | below the regression line. |  |  |  | | --- | --- | | D. | outside the relevant range. |   The regression line is Y = 415.69 + 1.0942X. In March, X is 180 and therefore Y is: Y = 415.69 + (1.0942 × 180) = $612.646. The actual maintenance cost for March was $596, which is less than $612.646. Therefore, the total maintenance cost for March is below the regression line. |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

|  |  |
| --- | --- |
|  | Recent maintenance costs of Gallander Corporation are listed below:      Management believes that maintenance cost is a mixed cost that depends on machine-hours. |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12. | Using the least-squares regression method, the estimate of the variable component of maintenance cost per machine-hour is closest to:      |  |  | | --- | --- | | A. | $1.85 |  |  |  | | --- | --- | | B. | $10.30 |  |  |  | | --- | --- | | **C.** | $1.67 |  |  |  | | --- | --- | | D. | $1.90 |   Using Microsoft Excel functions, the solution is: Maintenance cost per machine-hour = Slope = $1.67 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 13. | Using the least-squares regression method, the estimate of the fixed component of maintenance cost per month is closest to:      |  |  | | --- | --- | | **A.** | $6,066 |  |  |  | | --- | --- | | B. | $7,244 |  |  |  | | --- | --- | | C. | $5,944 |  |  |  | | --- | --- | | D. | $7,130 |   Using Microsoft Excel functions, the solution is: Fixed maintenance cost per month = Intercept = $6,066 |

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| --- |
| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

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| --- | --- |
|  | Cespedes Inc.'s inspection costs are listed below:      Management believes that inspection cost is a mixed cost that depends on units produced. |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 14. | Using the least-squares regression method, the estimate of the variable component of inspection cost per unit produced is closest to:      |  |  | | --- | --- | | A. | $5.40 |  |  |  | | --- | --- | | B. | $5.33 |  |  |  | | --- | --- | | **C.** | $5.43 |  |  |  | | --- | --- | | D. | $16.07 |   Using Microsoft Excel functions, the solution is: Variable cost per unit produced = Slope = $5.43 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 15. | Using the least-squares regression method, the estimate of the fixed component of inspection cost per month is closest to:      |  |  | | --- | --- | | A. | $6,983 |  |  |  | | --- | --- | | B. | $10,342 |  |  |  | | --- | --- | | C. | $10,527 |  |  |  | | --- | --- | | **D.** | $6,972 |   Using Microsoft Excel functions, the solution is: Fixed cost per month = Intercept = $6,972 |

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| --- |
| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

**Essay Questions**

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| 16. | CPE for CPAs, Inc., provides continuing professional education for certified public accountants. The company is relatively new and management is seeking information regarding the company's cost structure. The following information has been gathered for the first six months of the current year:      **Required**:  a. Using the high-low method, estimate the variable cost per seminar and the total fixed cost per month. b. Using the least-squares regression method, estimate the variable cost per seminar and the total fixed cost per month.     a. High-Low Method      Variable cost = Change in cost ÷ Change in activity Variable cost = $6,600 ÷ 8 seminars = $825 per seminar  Fixed cost = Total cost - Variable cost Fixed cost = $21,800 - (16 seminars × $825 per seminar) = $8,600  Y = $8,600 + $825X  b. Least-squares regression method Using Microsoft Excel functions, the estimates are: Variable cost per seminar = Slope = $9,000 Total fixed cost per month = Intercept = $800 Y = $9,000 + $800X |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 02-05 Analyze a mixed cost using a scattergraph plot and the high-low method. Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

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| 17. | The management of Buff Sports Stadium believes that the number of sporting events each month is an measure of activity for total clean-up cost. Shown below are event figures and total clean up costs for the past four months:      **Required**:  a. Estimate Buff's cost formula for monthly clean-up cost using the high-low method. b. Estimate Buff's cost formula for monthly clean-up cost using the least-squares regression method.     a.      Variable cost = Change in cost ÷ Change in activity Variable cost = $13,500 ÷ 18 events = $750 per event  Fixed cost = Total cost - Variable cost Fixed cost = $34,200 - ($750 per event × 34 events) = $8,700  Y = $8,700 + $750X  b. Least-squares regression method Using Microsoft Excel functions, the estimates are: Variable cost per seminar = Slope = $720 Total fixed cost per month = Intercept = $10,500 Y = $10,500 + $720X |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 02-05 Analyze a mixed cost using a scattergraph plot and the high-low method. Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

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| 18. | Sablan Inc. maintains a call center to take orders, answer questions, and handle complaints. The costs of the call center for a number of recent months are listed below:      Management believes that the cost of the call center is a mixed cost that depends on the number of calls taken.  **Required**:  Estimate the variable cost per call and fixed cost per month using the least-squares regression method.     Using Microsoft Excel functions, the solution is: Variable cost per call = Slope = $5.56 Fixed cost per month = Intercept = $75,218 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

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| 19. | Below are cost and activity data for a particular cost over the last four periods. Your boss has asked you to analyze this cost so that management will have a better understanding of how this cost changes in response to changes in activity.      **Required**:  Using the least-squares regression method, estimate the cost formula for this cost.     The solution using Microsoft Excel functions is: Variable cost = Slope = $2.55 Fixed cost = Intercept = $160.85 Therefore, the cost formula is $160.85 per period plus $2.55 per unit of activity or: Y = $160.85 + $2.55X  The solution using the formulas in the text is: n = 4 sumX = 183 sumY = 1,110 sumXY = 50,866 sumX^2 = 8,405  b = [n(sumXY) - (sumX)(sumY)]/[n(sumX^2) - (sumX)^2] = [4(50,866) - (183)(1,110)]/[4(8,405) - (183)^2] = $2.55 (rounded to nearest whole cent)  a = [(sumY) - b(sumX)]/n = [(1,110) - 2.55(183)]/4 = $161 (rounded to nearest whole dollar)  Cost formula: Y = $161 + $2.55X. |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

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| 20. | Escalona Printing Corp., a book printer, has provided the following data:      Management believes that the press setup cost is a mixed cost that depends on the number of titles printed. (A specific book that is to be printed is called a "title". Typically, thousands of copies will be printed of each title. Specific steps must be taken to setup the presses for printing each title-for example, changing the printing plates. The costs of these steps are the press setup costs.)  **Required**:  Estimate the variable cost per title printed and the fixed cost per month using the least-squares regression method.     The solution using Microsoft Excel functions is: Variable cost per title printed = Slope = $79.33 Fixed cost per month = Intercept = $1,826  The solution using the formulas in the text is: n = 8 sumX = 209 sumY = $31,187 sumXY = $835,931 sumX^2 = 5,727  b = [n(sumXY) - (sumX)(sumY))]/[n(sumX^2) - (sumX)^2] = [8($835,931) - (209)($31,187))]/[8(5,727) - (209)^2] = $79.33  a = [(sumY) - b(sumX)]/n = [($31,187) - $79.33(209)]/8 = $1,826  Any difference in the solutions is due to rounding errors when the formulas are used. |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 02A-08 Analyze a mixed cost using a scattergraph plot and the least-squares regression method.* |

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| 21. | The management of Sambrano Corporation would like to better understand the behavior of the company's warranty costs. Those costs are listed below for a number of recent months:      Management believes that warranty cost is a mixed cost that depends on the number of product returns.  **Required**:  Estimate the variable cost per product return and the fixed cost per month using the least-squares regression method.     The solution using Microsoft Excel functions is: Variable cost per product return = Slope = $41.30 Fixed cost per month = Intercept = $3,407  The solution using the formulas in the text is: n = 8 sumX = 185 sumY = $34,898 sumXY = $813,826 sumX^2 = 4,443  b = [n(sumXY) - (sumX)(sumY))]/[n(sumX^2) - (sumX)^2] = [8($813,826) - (185)($34,898))]/[8(4,443) - (185)^2] = $41.30  a = [(sumY) - b(sumX)]/n = [($34,898) - $41.30(185)]/8 = $3,407  Any difference in the solutions is due to rounding errors when the formulas are used. |

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