Student name:\_\_\_\_\_\_\_\_\_\_

1. Blackstock Company manufactures digital cameras. Indicate whether its cost behavior is fixed, variable, or mixed by placing X's in the appropriate boxes. As an example, commissions paid to sales staff would be classified as variable.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Cost Behavior** | | |
| **Cost** | **Fixed** | **Variable** | **Mixed** |
| **Insurance on executive offices** |  |  |  |
| **Lens caps for digital cameras** |  |  |  |
| **Depreciation on manufacturing equipment** |  |  |  |
| **Shipping cost to deliver products to customers** |  |  |  |
| **Salary of company president** |  |  |  |
| **Wages of assembly workers** |  |  |  |
| **Product advertising** |  |  |  |
| **Utilities: electricity to run machines and for heat and lights in factory** |  |  |  |

1. How does total fixed cost behave when volume increases?

1. How does fixed cost per unit behave when volume decreases?

1. How does total variable cost respond when volume increases?

1. How does variable cost per unit behave when volume decreases?

1. If a company had a pure fixed cost structure, what would be the relationship between a given dollar increase in sales and net income?

1. What are mixed or semivariable costs? Give an example of a mixed cost.

1. What is operating leverage, and how does a company achieve operating leverage?

1. What is meant by the phrase, "cost structure?"

1. How is operating leverage related to cost structure?

1. Describe the format of an income statement prepared using the contribution margin approach.

1. For Marvin Company, the magnitude of operating leverage was 3.5 during the current year. Demonstrate what this magnitude of operating leverage would mean for the company's profitability by creating an example.

1. If a company had a pure variable cost structure, what would be the relationship between contribution margin and net income, and what would be the magnitude of operating leverage?

1. What is meant by the phrase, "relevant range"? How does the concept of relevant range affect fixed costs?

1. Assume that wages expense is a variable cost and that the relevant range is 10,000 to 15,000 labor hours. Within that range, the cost is $15 per hour. What can you assume about wages expense outside this range?

1. What is an activity base, and how does the activity base relate to a variable cost?

1. Why would a company often calculate and use average costs of its products and services rather than actual costs?

1. Why would a company need to estimate the fixed and variable components of a mixed cost?

1. What is the high-low method used for?

1. Describe the steps in the high-low method.

1. What is a primary disadvantage of the high-low method of analyzing a mixed cost?

1. Compare least squares regression and the scattergraph method of analyzing mixed costs.

1. What advantages does the regression method of cost estimation offer, compared to the high-low and scattergraph methods of estimating mixed costs?

1. Assume that management uses the regression method to separate a mixed cost into its fixed and variable components. Briefly describe the significance of the R Square (R2) when interpreting the reliability of cost estimates that result.

1. Select the term from the list provided that best matches each of the following descriptions. The first is done for you.

|  |  |  |
| --- | --- | --- |
| **Answer** | **Description** | **List of terms** |
| **5** | A. A cost that remains constant in total when volume changes | 1. Mixed cost |
|  | B. The way a cost changes relative to changes in a measure of activity | 2. Operating leverage |
|  | C. A company's cost mix or relative proportion of variable and fixed costs to total costs | 3. Scattergraph method |
|  | D. The difference between a company's sales revenue and its variable costs | 4. Contribution margin |
|  | E. Costs composed of both fixed and variable components | 5. Fixed cost |
|  | F. A cost that changes in total in direct proportion to changes in volume | 6. Cost behavior |
|  | G. A factor that causes (or drives) changes in costs | 7. Activity base |
|  | H. A condition in which a percentage change in revenue will produce a proportionately larger percentage change in net income | 8. Variable cost |
|  | I. A method of estimating the fixed and variable components of mixed cost using two data observations | 9. Cost structure |
|  | J. A method of estimating the fixed and variable components of a mixed cost where data are plotted on a graph and a line is visually fit to the data | 10. High-low method |

1. Costs that might be incurred by service, merchandising, and manufacturing companies are described below:

|  |  |
| --- | --- |
| **Sales commissions paid to sales associates in a department store** | \_\_\_\_\_ |
| **Shipping cost for Amazon** | \_\_\_\_\_ |
| **Electricity cost to heat and light a law firm** | \_\_\_\_\_ |
| **Rent on a storeroom used by Turf Pros to store lawn equipment** | \_\_\_\_\_ |
| **Salary of a supervisor in a Best Buy distribution center** | \_\_\_\_\_ |
| **Wages paid to production workers in a General Motors plant** | \_\_\_\_\_ |
| **Insurance on a Hershey factory** | \_\_\_\_\_ |
| **Fuel costs for Southwest Airlines** | \_\_\_\_\_ |
| **Depreciation of office equipment by Microsoft Corporation** | \_\_\_\_\_ |
| **Dishwashing in an Olive Garden restaurant** | \_\_\_\_\_ |
| **Salary of the CEO of Microsoft** | \_\_\_\_\_ |
| **Lubricants used to maintain machinery in a textile factory** | \_\_\_\_\_ |
| **Cost of metal cans used in a dog food factory** | \_\_\_\_\_ |
| **Cost of pizza boxes for Domino's Pizza** | \_\_\_\_\_ |
| **Material handling costs for Frito Lay** | \_\_\_\_\_ |

**Required:**Classify each cost as variable or fixed with respect to volume or level of activity.

1. Complete the following table to indicate your understanding of fixed and variable cost behavior by inserting one of the following responses in each box: "Remain constant," "Increase," or "Decrease."

|  |  |  |
| --- | --- | --- |
|  | **When Activity Increases** | **When Activity Decreases** |
| **Unit fixed costs** |  |  |
| **Total fixed costs** |  |  |
| **Unit variable costs** |  |  |
| **Total variable costs** |  |  |

1. Sandford Company manufactures one product. Its variable manufacturing cost is $16 per unit; total fixed manufacturing cost is $600,000.  
   **Required**
   * + - 1. Calculate Sandford's total manufacturing costs if it produces 10,000 units.
         2. What would be the total cost per unit (including both fixed and variable costs) assuming that Sandford produces 10,000 units?

1. Phoenix Corporation manufactures smartphones, generally selling from 200,000 to 300,000 units per year. The following cost data apply to the activity levels shown:

|  |  |  |  |
| --- | --- | --- | --- |
| **Number of Units** | 200,000 | 250,000 | 300,000 |
| **Total costs** |  |  |  |
| **Fixed** | $ 15,000,000 |  |  |
| **Variable** | 24,000,000 |  |  |
| **Total costs** | 39,000,000 |  |  |
| **Cost per Unit** |  |  |  |
| **Fixed** | $ 75 |  |  |
| **Variable** | 120 |  |  |
| **Total cost per unit** | $ 195 |  |  |

**Required**

* + - * 1. Complete the preceding table by filling the missing amounts for 250,000 and 300,000 units.
        2. Assume that Phoenix actually makes 280,000 units. What would be the total costs and the cost per unit at this level of activity? Note: Round the cost per unit to two decimal places
        3. If Phoenix sells each unit for $220, what is Phoenix's magnitude of operating leverage at sales of 280,000 units? Note: Round to two decimal places.

1. Grant Company and Lee Company compete in the same market. The following budgeted income statements illustrate their cost structures.

|  |  |  |
| --- | --- | --- |
|  | **Grant Company** | **Lee Company** |
| **Number of customers** | 200 | 200 |
| **Sales revenue (200 × $150)** | $ 30,000 | $ 30,000 |
| **Less variable costs** | 6,000 | 18,000 |
| **Contribution margin** | $ 24,000 | $ 12,000 |
| **Less fixed costs** | 19,000 | 7,000 |
| **Net income** | $ 5,000 | $ 5,000 |

**Required**

* + - * 1. If Grant Company lowers its price to $135, it will lure 80 customers away from Lee Company. Prepare Grant's income statement based on 280 customers.
        2. If Lee Company lowers its price to $135 (assuming that Grant Company is still charging $150 per customer), Lee would lure 80 customers away from Grant. Prepare Lee's income statement based on 280 customers.
        3. Which of the companies would benefit more from lowering its sales price to attract more customers, and why?

1. Income statements for three companies are provided below:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Company A** | **Company B** | **Company C** |
| **Sales (20 units)** | $ 1,000 | $ 1,000 | $ 1,000 |
| **Less variable costs** | 600 | 300 | - |
| **Less fixed costs** | 200 | 500 | 800 |
| **Net income** | $ 200 | $ 200 | $ 200 |

**Required**

* + - * 1. Prepare new income statements for the firms assuming each sells one additional unit (i.e. each firm sells 21 units)
        2. Which company has the highest operating leverage?

1. Former NFL coach Joe Gibbs is highly sought after as a guest speaker. His fee can run as high as $150,000 for a single two-hour appearance. Recently, he was asked to speak at a seminar offered by the National Sports in Education Foundation (NSEF). Due to the charitable nature of the organization, Mr. Gibbs offered to speak for $100,000. NSEF planned to invite 350 guests who would each make a $500 contribution to the organization. The Foundation's executive director was concerned about committing so much of the organization's cash to this one event. So instead of the $100,000 fee she countered with an offer to pay Mr. Gibbs 50% of the revenue received from the seminar and no other payments.  
   **Required**
   * + - 1. Classify the two offers in terms of cost behavior (fixed versus variable). Scenario A, NSEF pays Gibbs a $100,000 fee: Scenario B, NSEF pays Gibbs 50% of revenue:
         2. Compute the budgeted income (assuming there are no other expenses) under each of the following scenarios: 1) NSEF agrees to pay the $100,000 fee, and 350 guests actually attend the seminar; and 2) NSEF pays Mr. Gibbs 50% of revenue, and 350 guests attend the seminar.
         3. For each scenario ($100,000 fee versus 50% of revenue), compute the percentage increase in profit that would result if the Foundation is able to increase attendance by 20 percent over the original plan (to a total of 420). Note: Round the percentages to the nearest whole numbers.
         4. For each scenario, compute NSEF's cost per contributor if 350 attend and if 420 contributors attend. Note: Round the cost per contributor to two decimal points.
         5. Summarize the impact on risk and profits of shifting the cost structure from fixed to variable costs.

1. Assume that Microsoft and Sony both plan to introduce a new hand-held video game. Microsoft plans to use a heavily automated production process to produce its product while Sony plans to use a labor-intensive production process. The following revenue and cost relationships are provided:

|  |  |  |
| --- | --- | --- |
|  | **Microsoft Game** | **Sony Game** |
| **Selling price per unit** | 150 | 150 |
| **Variable cost per unit** |  |  |
| **Direct material** | $ 27.00 | $ 27.00 |
| **Direct labor** | 7.50 | 30.00 |
| **Overhead** | 7.50 | 30.00 |
| **Selling and administrative** | 3.00 | 3.00 |
| **Annual fixed costs** |  |  |
| **Overhead** | $ 600,000 | $ 240,000 |
| **Selling and administrative** | 135,000 | 135,000 |

**Required**

* + - * 1. Compute the contribution margin per unit for each company.
        2. Prepare a contribution income statement for each company assuming each company sells 8,000 units.
        3. Compute each firm's net income if the number of units sold increases by 10%.
        4. Which firm will have more stable profits when sales change? Why?

1. Cannon Company operates a clothing store that reported the following operating results for the current year:

|  |  |
| --- | --- |
| Income Statement | |
| **Sales revenue** | $ 2,000,000 |
| **Cost of goods sold** | (1,200,000) |
| **Gross margin** | $ 800,000 |
| **Employee commissions and bonuses (5% of sales)** | (100,000) |
| **Depreciation expense** | (150,000) |
| **Salaries expense** | (260,000) |
| **Shipping and delivery expense (2% of sales)** | (40,000) |
| **Advertising expense** | (80,000) |
| **Net income** | $ 170,000 |

**Required**Prepare an income statement for Cannon Company using the contribution margin format.

1. Contribution margin income statements for two competing companies are provided below:

|  |  |  |
| --- | --- | --- |
|  | **Yin Company** | **Yang Company** |
| **Revenue** | $ 750,000 | $ 750,000 |
| **Less variable costs** | 300,000 | 525,000 |
| **Contribution margin** | $ 450,000 | $ 225,000 |
| **Less fixed costs** | 405,000 | 180,000 |
| **Net income** | $ 45,000 | $ 45,000 |

**Required**

* + - * 1. Show each company's cost structure by inserting the percentage of the company's revenue represented by each item on the contribution margin income statement.
        2. Compute each company's magnitude of operating leverage.
        3. Using the operating leverage measures computed in requirement b, determine the increase in each company's net income (percentage and amount) if each company experiences a 10 percent increase in sales.
        4. Assume that sales are expected to continue to increase for the foreseeable future, which company probably has more desirable cost structure? Why?

1. ETutor is an online tutoring service provider that is particularly popular with college students. The company is interested in estimating the fixed and variable components of its tutoring services costs. The manager believes that these costs are driven by the number of hours of tutoring services provided. The following information was gathered for the last six months of business:

|  |  |  |
| --- | --- | --- |
| **Month** | **Number of Hours** | **Tutoring Costs** |
| **January** | 25,000 | $ 308,000 |
| **February** | 41,000 | 420,000 |
| **March** | 29,000 | 352,000 |
| **April** | 31,000 | 373,000 |
| **May** | 34,000 | 378,000 |
| **June** | 18,000 | 252,000 |

**Required:**

* + - * 1. Compute the average tutoring cost per hour for the six-month period. Note: Round the average tutoring cost per hour to two decimal points.
        2. Use the high-low method to estimate the total fixed cost and the variable cost per hour. Note: Round the variable cost per hour to two decimal points.
        3. Name one advantage and one disadvantage of the high-low method.
        4. Describe the scattergraph method that can be used to analyze mixed costs.

1. Maryland Novelties Company produces and sells souvenir products. Monthly income statements for two activity levels are provided below:

|  |  |  |
| --- | --- | --- |
| **Unit volumes** | **20,000 units** | **30,000 units** |
| **Revenue** | $ 150,000 | $ 225,000 |
| **Less cost of goods sold** | 60,000 | 90,000 |
| **Gross margin** | $ 90,000 | $ 135,000 |
| **Less operating expenses** |  |  |
| **Salaries and commissions** | 20,000 | 25,000 |
| **Advertising expenses** | 30,000 | 30,000 |
| **Administrative expenses** | 12,500 | 12,500 |
| **Total operating expenses** | 62,500 | 67,500 |
| **Net income** | $ 27,500 | $ 67,500 |

**Required**

* + - * 1. Identify the mixed expense(s).
        2. Use the high-low method to separate the mixed costs into variable and fixed components.
        3. Prepare a contribution margin income statement at the 20,000-unit level.

**Answer Key**Test name: Chapter 02 Test Bank (Problem Material)

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