Problem 12.20

**CVP application – eliminate production from operations?** Body Sculpture Inc., make three models of high-performance weight-training benches. Current operating data are summarized here:

|  |  |  |  |
| --- | --- | --- | --- |
|  | MegaMuscle | PowerGym | ProForce |
| Selling price per unit | $280 | $400 | $580 |
| Contribution margin per unit | 84 | 154 | 116 |
| Monthly sales volume - units | 6,000 | 4,000 | 2,000 |
| Fixed expenses per month |  |  |  |
|  |  | Total of 1,280,000 |  |
|  |  |  |  |

**Required:**

1. Calculate the contribution margin ratio of each product.
2. Calculate the firm’s overall contribution margin ratio
3. Calculate the firm’s monthly break-even point in sales dollars.
4. Calculate the firm’s monthly operating income.
5. Management is considering the elimination of the ProForce model due to its low sales volume and low contribution margin ratio. As a result, total fixed expenses sales volume can be reduced to $1,080,000 per month. Assuming that this change would not affect the other models, would you recommend the elimination of the ProForce model? Explain your answer.
6. Assume the same facts as in part e. Assume also that the sales volume for the PowerGym model will increase by 1,000 units per month if the ProForce model is eliminated. Would you recommend eliminating the ProForce model? Explain your answer?

Problem12.26

**Understanding the effects of operating leverage**  HighTech, Inc., and OldTime Co. compete within the same industry and had the following operating results in 2010:

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | **HighTech, Inc.** | **OldTime Co.** |
| Sales | $2,100,000 | $2,100,000 |
| Variable expenses | 420,000 | 1,260,000 |
| Contribution margin | $1,680,000 | $840,000 |
| Fixed expenses | 1,470,000 | 630,000 |
| Operating income | $210,000 | $210,000 |
|  |  |  |

**Required:**

1. Calculate the break-even point for each firm in terms of revenue.
2. What observations can you draw by examining the break-even point of each firm given that they earned an equal amount of operating income on identical sales volumes in 2010?
3. Calculate the amount of operation income (or loss) that you would expect each firm to report in 2011 if sales were to
4. Increase by 20%.
5. Decrease by 20%.
6. Using the amounts computed in requirement **c**, calculate the increase or decrease in the amount of operating income expected in 2011 from the amount reported in 2010.
7. Explain why an equal percentage increase (or decrease) in sales for each firm would have such differing effects on operating income.
8. Calculate the ratio of contribution margin to operating income for each firm in 2010. *(Hint: Divide contribution margin by operating income.)*
9. Multiply the expected increase in sales of 20% for 2011 by the ratio contribution margin to operating income for 2010 computed in requirement **f** for each firm. *(Hint: Multiply your answer in requirement* ***f*** *by 0.2)*
10. Multiply your answer in requirement **g** by the operating income of $210,000 reported in 2010 for each firm.
11. Compare your answer in requirement **h** with your answer in requirement **d**. What conclusions can you draw about the effects of operating leverage from the steps you performed in requirements **f**, **g**, and **h**?

Problem 13.10

**Manufacturing overhead-over/underapplied LampArtCo**. Makes specialty table lamps. Manufacturing overhead is applied to production on a direct labor hours basis. During November, the first month of the company’s fiscal year, $173,250 of manufacturing overhead was applied to Work in Process Inventory using the predetermined overhead application rate of $15per direct labor hour.

**Required:**

1. Calculate the number of hours of direct labor used during November.
2. Actual manufacturing overhead costs incurred during November totaled $166,425. Calculate the amount of over- or underapplied overhead for November.
3. Identify two possible explanations for the over- or underapplied overhead.
4. Explain the accounting appropriate for the over- or underapplied overhead at the end of November.

Problem 13.16

**Activity-based costing versus traditional overhead allocation methods**

Galvaset Industries manufactures and sells custom-made windows. Its job costing system was designed using an activity-based costing approach. Direct materials and direct labor costs are accumulated separately, along with information concerning three manufacturing overhead cost drivers (activities). Assume that the direct labor rate is $20 per hour and there were no beginning inventories. The following information was available for 2010, based on an expected production level of 50,000 units for the year, which willrequire 200,000 direct labor hours:

|  |  |  |  |
| --- | --- | --- | --- |
| **Activity (Cost Driver)** | **Budgeted Costs for 2010** | **Cost Driver Used as Allocation Base** | **Cost Allocation Rate** |
| Materials handling | $325,000 | Number of parts used | $0.25 per part |
| Cutting and lathe work | 2,340,000 | Number of parts used | 1.80 per part |
| Assembly and inspection | 5,000,000 | Direct labor hours | $25.00 per hour |

The following production, costs, and activities occurred during the month of March:

|  |  |  |  |
| --- | --- | --- | --- |
| **Units Produced** | **Direct Materials Costs** | **Number of Parts Used** | **Direct Labor Hours** |
| 3,800 | $142,000 | 83,600 | 17,180 |

**Required:**

1. Calculate the total manufacturing costs and the cost per unit of the windows produced during the month of March (using the activity-based costing approach).
2. Assume instead that Galvaset Industries applies manufacturing overhead on a direct labor hours basis (rather than using the activity-based costing system previously described).Calculate the total manufacturing cost and the cost per unit of the windows produced during the month of March. *(Hint: you will need to calculate the predetermined overhead application rate using the total budgeted overhead cost for 2010.)*
3. Compare the per unit cost figures calculated in parts **a** and **b**. Which approach do you think provides better information for manufacturing managers? Explain your answer.