Problem 4 – 22

1. CM ratio =

Break-even point in unit sales =

Break-even point in dollar sales = break-even point in unit sales \* $30 = $600,000

1. If sales increase $80,000, contribution margin will increase $80,000 \* 0.3 = $24,000. Because the cost of advertisement is $16,000, this advertisement makes $24,000 - $16,000 = $8,000 monthly net operating income.
2. This advertisement changes the company’s sales from $585,000 to 39,000 \* $27 = $1,053,000. Then, contribution margin will be $1,053,000 - $819,000 = $234,000 and CM ratio will be 2(rounded). Also, because it makes increase of $60,000 in fixed expenses, Net operating loss will be changed from - $4,500 to $234,000 – ($180,000 + $60,000) = - $6,000.
3. This new package cost will change variable cost from $409,500 to $424,125. Unit contribution margin also will be changed to ($585,000 - $424,125) / 19,500 = $8.25. To earn a profit of $9,750, the company has to sell units each month.
4. A. CM ratio =

Break-even point in unit sales =

Break-even point in dollar sales =

B. not automated.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Amount | Per Unit | Percent |
| Sales | $780,000 | $30 | 100% |
| Variable expenses | $546,000 | $21 | 70% |
| Contribution margin | $234,000 | $9 | 30% |
| Fixed expenses | $180,000 | $6.92(rounded) | 23.08%(rounded) |
| Net operating income | $54,000 | $2.08(rounded) | 6.92%(rounded) |

automated.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Amount | Per Unit | Percent |
| Sales | $780,000 | $30 | 100% |
| Variable expenses | $468,000 | $18 | 60% |
| Contribution margin | $312,000 | $12 | 40% |
| Fixed expenses | $252,000 | $9.69(rounded) | 32.31%(rounded) |
| Net operating income | $60,000 | $2.31(rounded) | 7.69%(rounded) |

C. If sales will be more than break-even point in unit sale of automate case 21,000 unit, I recommend the company automate its operations. Because CM ratio of automated is bigger than original operations, when sales more than break-even, the more sales make, the more profit is given in automation.

Problem 4 – 29



|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Not automated | | | Automated | | |
|  | Amount | Per Unit | Percent | Amount | Per Unit | Percent |
| Sales | $450,000 | $30 | 100% | $450,000 | $30 | 100% |
| Variable expenses | $315,000 | $21 | 70% | $180,000 | $12 | 40% |
| Contribution margin | $135,000 | $9 | 30% | $270,000 | $18 | 60% |
| Fixed expenses | $90,000 | $6 |  | $225,000 | $15 |  |
| Net operating income | $45,000 | $3 | 10% | $45,000 | $3 | 10% |

1. (a) The degree of operating leverage in present operations =

The degree of operating leverage in new operations =

(b) The break-even point in dollar sales in present operations =

The break-even point in dollar sales in new operations =

(c) The margin of safety in dollar in present operations = $450,000 – $300,000 = $150,000

The margin of safety in percentage terms in present operations = $150,000/$450,000 = 33.33%(rounded)

The margin of safety in dollar in new operations = $450,000 – $375,000 = $75,000

The margin of safety in percentage terms in new operations = $75,000/$450,000 = 16.67%(rounded)

1. If sales volume could be higher than $450,000, the company can make more profit from their operations than previous operations. That’s why I consider sales volume is most important factor to decide whether to purchase the new equipment.
2. Break-even point in dollar sales under new marketing strategy =

Net operating income and operating leverage is increased in new marketing strategy compared to original strategy. Also, proportion of fixed expenses in sales is smaller than buying new equipment strategy, which is good for the company because its sales is affected by general economic condition from year to year. Thus, I agree with the marketing manger’s proposal to take new marketing strategy.