## HILTON CHAPTER 2 P57 AND P58 PROBLEM SOLUTION

## Problem 2-57

1. If the company buys 40,000 units of Part JR63, at a price of $*X* per unit, its total cost will be:

## (40,000 × $*X*) + $45,000

If the company manufactures the parts, its total cost will be:

## (40,000 × $12) + $165,000

By equating these two expressions for total cost, we can solve for the price, *X,* at which the total cost is the same under the two alternatives:



Thus the firm will realize a net benefit by purchasing Part JR63 if the outside supplier charges a price less than $15.

2. If the firm buys *Y* units of Part JR63 at a unit price of $14, the total cost will be:



If the company manufactures *Y* units of Part JR63, the total cost will be:

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If we equate these expressions, we can solve for the number of parts, *Y,* at which the firm will be indifferent between making and buying Part JR63.



## Thus, the company will be indifferent between the two alternatives if it requires 60,000 units of Part JR63 each month.

## Problem 2-58

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. | Output  (.75 liter bottles) | Calculation | Unit Cost |  |
|  | 10,000 | $212,400/10,000 | $21.24 | | |
|  | 15,000 | $234,600/15,000 | $15.64 | | |
|  | 20,000 | $256,800/20,000 | $12.84 | |
|  |  |  |  |  | |

The unit cost is minimized at a sales volume of 20,000 bottles.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2. | Output (.75 liter bottles) | Sales Revenue | Total Costs | Profit |
|  | 10,000 | $216,000 | $212,400 | $ 3,600 |
|  | 15,000 | 270,000 | 234,600 | 35,400 |
|  | 20,000 | 288,000 | 256,800 | 31,200 |
|  |  |  |  |  |

Profit is maximized at a production level of 15,000 bottles of wine.

3. The 15,000-bottle level is best for the company, since it maximizes profit.

4. The unit cost decreases as output increases, because the fixed cost per unit declines as production and sales increase.

A lower price is required to motivate consumers to purchase a larger amount of wine.

**PROBLEM 6-38**

1. **Straight-line depreciation—committed fixed**

**Charitable contributions—discretionary fixed**

**Mining labor/fringe benefits—variable**

**Royalties—semivariable**

**Trucking and hauling—step-fixed**

**The per-ton mining labor/fringe benefit cost is constant at both volume levels presented, which is characteristic of a variable cost.**

**$315,000 ÷ 1,400 tons = $225 per ton**

**$607,500 ÷ 2,700 tons = $225 per ton**

**Royalties have both a variable and a fixed component, making it a semivariable (mixed) cost.**

**Variable royalty cost = difference in cost ÷ difference in tons**

**= ($224,500 – $140,000) ÷ (2,700 – 1,400)**

**= $84,500 ÷ 1,300 tons**

**= $65 per ton**

**Fixed royalty cost:**

|  |  |  |
| --- | --- | --- |
|  | **June**  **(2,700 tons)** | **December**  **(1,400 tons)** |
| **Total royalty cost……………………….** | **$224,500** | **$140,000** |
| **Less: Variable cost at $65 per ton…..** | **175,500** | **91,000** |
| **Fixed royalty cost………………………** | **$ 49,000** | **$ 49,000** |

**2. Total cost for 1,700 tons:**

|  |  |
| --- | --- |
| **Depreciation…………………………………………...** | **$ 30,000** |
| **Charitable contributions…………………………….** | **----** |
| **Mining labor/fringe benefits at $225 per ton…….** | **382,500** |
| **Royalties:** |  |
| **Variable at $65 per ton…………………………..** | **110,500** |
| **Fixed………………………………………………..** | **49,000** |
| **Trucking and hauling………………………………..** | **280,000** |
| **Total………………………………………………..** | **$852,000** |

**PROBLEM 6-38 (CONTINUED)**

**3. Hauling 1,400 tons is not particularly cost effective. Lone Mountain Extraction will incur a cost of $280,000 if it needs 1,400 tons hauled or, for that matter, 1,899 tons. The company would be better off if it had 1,399 tons hauled, saving outlays of $40,000. In general, with this type of cost function, effectiveness is maximized if a firm operates on the right-most portion of a step, just prior to a jump in cost.**

**4. A committed fixed cost results from an entity’s ownership or use of facilities and its basic organizational structure. Examples of such costs include property taxes, depreciation, rent, and management salaries. Discretionary fixed costs, on the other hand, arise from a decision to spend a particular amount of money for a specific purpose. Outlays for research and development, advertising, and charitable contributions fall in this category.**

**In times of severe economic difficulties, a company’s management will often try to cut discretionary fixed costs. Such costs are more easily altered in the short run and do not have as significant long-term ramifications for a firm as do more long-lasting actions. While it’s true that cutting expenditures on advertising or R & D can often have adverse long-term consequences, other cuts could have even more significant negative consequences in the future. The decision to close a manufacturing facility, for example, could reduce property taxes, rent, and/or depreciation. However, that decision may result in a significant long-run change in operations that may be difficult to overturn when economic conditions rebound.**

**5. Lone Mountain Extraction uses a calendar year for tax-reporting purposes. At year-end, it may have ample funds available and decide to make donations to charitable causes. Such contributions are deductible in computing the company’s tax obligation to the government. Tax deductions reduce taxable income and, therefore, produce a tax savings for the firm.**