CHAPTER 11: DECISION MAKING AND RELEVANT INFORMATION

*TRUE/FALSE*

1. A decision model is a formal method for making a choice, frequently involving both quantitative and qualitative analyses.

*Answer*: True

2. Feedback from previous decisions uses historical information and, therefore, is irrelevant for making future predictions.

*Answer*: False

Historical costs may be helpful in making future predictions, but are not relevant costs for decision making.

3. The amount paid to purchase tools last month is an example of a sunk cost.

*Answer*: True

4. For decision making, differential costs assist in choosing between alternatives.

*Answer*: True

5. For a particular decision, differential revenues and differential costs are always relevant.

*Answer*: True

6. A cost may be relevant for one decision, but not relevant for a different decision.

*Answer*: True

7. Revenues that remain the same for two alternatives being examined are relevant revenues.

*Answer*: False

Revenues that remain the same between two alternatives are irrelevant for that decision since they do not differ between alternatives.

8. Sunk costs are past costs that are unavoidable.

*Answer*: True

9. Quantitative factors are always expressed in numerical terms.

*Answer*: True

10. Qualitative factors are outcomes that are measured in numerical terms, such as the costs of direct labor.

*Answer*: False

*Quantitative* factors are outcomes that are measured in numerical terms, such as the costs of direct labor.

11. If a manufacturer chooses to continue purchasing direct materials from a supplier because of the ongoing relationship that has developed over the years, the decision is based on qualitative factors.

*Answer*: True

12. Relevant revenues and relevant costs are the only information managers need to select among alternatives.

*Answer*: False

Qualitative factors, as well as relevant revenues and relevant costs need to be considered when selecting among alternatives.

13. Full costs of a product are relevant for one-time-only special order pricing decisions.

*Answer*: False

Incremental costs of a product are relevant for one-time-only special order pricing decisions.

14. Full costs of a product include variable costs, but not fixed costs.

*Answer*: False

Full costs of a product include variable and fixed costs for all business functions in the value chain.

15. For one-time-only special orders, variable costs may be relevant but not fixed costs.

*Answer*: True

16. The price quoted for a one-time-only special order may be less than the price for a long-term customer.

*Answer*: True

17. Bid prices and costs that are relevant for regular orders are the same costs that are relevant for one-time-only special orders.

*Answer*: False

Since long-term costs are relevant for regular orders and short-term costs are relevant for one-time-only special orders, the relevant costs differ.

18. An incremental product cost is generally a fixed cost.

*Answer*: False

An incremental product cost is generally a *variable* cost.

19. If Option 1 costs $100 and Option 2 costs $80, then the differential cost is $180.

*Answer*: False

If Option 1 costs $100 and Option 2 costs $80, then the differential cost is $20.

20. Producing another 10,000 units *may* increase the fixed cost of rent.

*Answer*: True

True, if additional capacity must be added to accommodate the additional production needs.

21. Absorption cost per unit is the best product cost to use for one-time-only special order decisions.

*Answer*: False

Variable cost per unit is the best cost to use for one-time-only special order decisions.

22. Sometimes qualitative factors are the most important factors in make-or-buy decisions.

*Answer*: True

23. If a company is deciding whether to outsource a part, the reliability of the supplier is an important factor to consider.

*Answer*: True

24. Outsourcing is risk free to the manufacturer because the supplier now has the responsibility of producing the part.

*Answer*: False

Outsourcing has risks since the manufacturer is dependent on the supplier for a quality product, delivered in a timely manner, for a reasonable price.

25. When a firm maximizes profits it will simultaneously minimize opportunity costs.

*Answer*: True

26. In a make-or-buy decision when there are alternative uses for capacity, the opportunity cost of idle capacity is relevant.

*Answer*: True

27. When opportunity costs exist, they are always relevant.

*Answer*: True

28. When capacity is constrained, relevant costs equal incremental costs plus opportunity costs.

*Answer*: True

29. If the $17,000 spent to purchase inventory could be invested and earn interest of $1,000, then the opportunity cost of holding inventory is $17,000.

*Answer*: False

The opportunity cost of holding inventory is $1,000.

30. The choice is not really whether to make or buy, but rather how to best utilize available production capacity.

*Answer*: True

31. For short-run product-mix decisions, managers should focus on minimizing total fixed costs.

*Answer*: False

For short-run product mix decisions, managers should focus on *maximizing* total *contribution margin*.

32. For short-run product-mix decisions, maximizing contribution margin will also result in maximizing operating income.

*Answer*: True

33. Regardless of the restraining resource, to maximize profits managers should produce more of the product with the greatest contribution margin per unit.

*Answer*: False

To maximize profits, managers should produce more of the product with the *greatest contribution margin per unit of the constraining resource*.

34. Management should focus on per unit costs when deciding whether to discontinue a product or not.

*Answer*: False

Management should focus on *total costs* when deciding whether to discontinue a product or not.

35. Avoidable variable and fixed costs should be evaluated when deciding whether to discontinue a product, product line, business segment, or customer.

*Answer*: True

36. Depreciation allocated to a product line is a relevant cost when deciding to discontinue that product.

*Answer*: False

Depreciation is a sunk cost and never relevant.

37. A company is considering adding a fourth product to use available capacity. A relevant factor to consider is that corporate costs can now be allocated over four products rather than only three.

*Answer*: False

It appears that corporate costs will not change in total, and therefore are not relevant costs for deciding whether to add a fourth product.

38. When replacing an old machine with a new machine, the purchase price of the new machine is a relevant cost.

*Answer*: True

39. When replacing an old machine with a new machine, the book value of the old machine is a relevant cost.

*Answer*: False

The original price of the old machine is a past cost and therefore an irrelevant cost.

40. Replacing an old machine will increase operating income in the long run, but not for this year. A manager may choose not to replace the machine if performance evaluations are based on performance over a single year.

*Answer*: True

41. Linear programming is a tool that maximizes total contribution margin of a mix of products with multiple constraints.

*Answer*: True *Objective*: A

*MULTIPLE CHOICE*

42. Feedback regarding previous actions may affect

a. future predictions.

b. implementation of the decision.

c. the decision model.

d. all of the above.

*Answer*: d

43. Place the following steps from the five-step decision process in order:

A = Make predictions about future costs

B = Evaluate performance to provide feedback

## C = Implement the decision

D = Choose an alternative

a. D C A B

b. C D A B

c. A D C B

d. D C B A

*Answer*: c

44. The formal process of choosing between alternatives is known as

a. a relevant model.

b. a decision model.

c. an alternative model.

d. a prediction model.

*Answer*: b

45. Ruggles Circuit Company manufactures circuit boards for other firms. Management is attempting to search for ways to reduce manufacturing labor costs and has received a proposal from a consulting company to rearrange the production floor next year. Using the information below regarding current operations and the new proposal, which of the following decisions should management accept?

Currently Proposed

Required machine operators 5 4.5

Materials-handling workers 1.25 1.25

Employee average pay $8 per hour $9 per hour

Hours worked per employee 2,100 2,000

a. Do not change the production floor.

b. Rearrange the production floor.

c. Either, because it makes no difference to the employees.

d. It doesn't matter because the costs incurred will remain the same.

*Answer*: b

Current operations: 5 workers x 2,100 hours x $8.00 = $84,000

Proposal: 4.5 workers x 2,000 hours x $9.00 = $81,000

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 46 AND 47.

LeBlanc Lighting manufactures small flashlights and is considering raising the price by 50 cents a unit for the coming year. With a 50-cent price increase, demand is expected to fall by 3,000 units.

**Currently Projected**

Demand 20,000 units 17,000 units

Selling price $4.50 $5.00

Incremental cost per unit $3.00 $3.00

46. If the price increase is implemented, operating profit is projected to

a. increase by $4,000.

b. decrease by $4,000.

c. increase by $6,000.

d. decrease by $4,500.

*Answer*: a

[17,000 x ($5 - $3)] – [20,000 x ($4.50 - $3.00)] = increase of $4,000

47. Would you recommend the 50-cent price increase?

a. No, because demand decreased.

b. No, because the selling price increases.

c Yes, because contribution margin per unit increases.

d. Yes, because operating profits increase.

*Answer*: d

48. For decision making, a listing of the relevant costs

a. will help the decision maker concentrate on the pertinent data.

b. will only include future costs.

c. will only include costs that differ among alternatives.

d. should include all of the above.

*Answer*: d

49. Sunk costs

a. are relevant.

b. are differential.

c. have future implications.

d. are ignored when evaluating alternatives.

*Answer*: d

50. A computer system installed last year is an example of

a. a sunk cost.

b. a relevant cost.

c. a differential cost.

d. an avoidable cost.

*Answer*: a

51. Costs that CANNOT be changed by any decision made now or in the future are

a. fixed costs.

b. indirect costs.

c. avoidable costs.

d. sunk costs.

*Answer*: d

52. In evaluating different alternatives, it is useful to concentrate on

a. variable costs.

b. fixed costs.

c. total costs.

d. relevant costs.

*Answer*: d

53. Which of the following costs always differ among future alternatives?

a. Fixed costs

b. Historical costs

c. Relevant costs

d. Variable costs

*Answer*: c

54. Which of the following costs are never relevant in the decision-making process?

a. Fixed costs

b. Historical costs

c. Relevant costs

d. Variable costs

*Answer*: b

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 55 AND 56.

Jim’s 5-year-old Geo Prizm requires repairs estimated at $3,000 to make it roadworthy again. His friend, Julie, suggested that he should buy a 5-year-old used Honda Civic instead for $3,000 cash. Julie estimated the following costs for the two cars:

**Geo Prizm Honda Civic**

Acquisition cost $15,000 $3,000

Repairs $ 3,000 ---

Annual operating costs

(Gas, maintenance, insurance) $ 2,280 $2,100

55. The cost NOT relevant for this decision is(are)

a. the acquisition cost of the Geo Prizm.

b. the acquisition cost of the Honda Civic.

c. the repairs to the Geo Prizm.

d. the annual operating costs of the Honda Civic.

*Answer*: a

56. What should Jim do? What are his savings in the first year?

a. Buy the Honda Civic; $9,780

b. Fix the Geo Prizm; $5,518

c. Buy the Honda Civic; $180

d. Fix the Geo Prizm; $5,280

*Answer*: c

Geo ($3,000 + $2,280) - Honda ($3,000 + $2,100) = $180 cost savings with the Honda option

57. Quantitative factors

a. include financial information, but not nonfinancial information.

b. can be expressed in monetary terms.

c. are always relevant when making decisions.

d. include employee morale.

*Answer*: b

58. Qualitative factors

a. generally are easily measured in quantitative terms.

b. are generally irrelevant for decision making.

c. may include either financial or nonfinancial information.

d. include customer satisfaction.

*Answer*: d

59. Historical costs are helpful

a. for making future predictions.

b. for decision making.

c. because they are quantitative.

d. with none of the above.

*Answer*: a

60. When making decisions

a. quantitative factors are the most important.

b. qualitative factors are the most important.

c. appropriate weight must be given to both quantitative and qualitative factors.

d. both quantitative and qualitative factors are unimportant.

*Answer*: c

61. Employee morale at Dos Santos, Inc., is very high. This type of information is known as

a. a qualitative factor.

b. a quantitative factor.

c. a nonmeasurable factor.

d. a financial factor.

*Answer*: a

62. Roberto owns a small body shop. His major costs include labor, parts, and rent. In the decision-making process, these costs are considered to be

a. fixed.

b. qualitative factors.

c. quantitative factors.

d. variable.

*Answer*: c

63. One-time-only special orders should only be accepted if

a. incremental revenues exceed incremental costs.

b. differential revenues exceed variable costs.

c. incremental revenues exceed fixed costs.

d. total revenues exceed total costs.

*Answer*: a

64. When deciding to accept a one-time-only special order from a wholesaler, management should do all EXCEPT

a. analyze product costs.

b. consider the special order’s impact on future prices of their products.

c. determine whether excess capacity is available.

d. verify past design costs for the product.

*Answer*: d

65. When there is excess capacity, it makes sense to accept a one-time-only special order for less than the current selling price when

a. incremental revenues exceed incremental costs.

b. additional fixed costs must be incurred to accommodate the order.

c. the company placing the order is in the same market segment as your current customers.

d. it never makes sense.

*Answer*: a

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 66 THROUGH 69.

Welch Manufacturing is approached by a European customer to fulfill a one-time-only special order for a product similar to one offered to domestic customers. Welch Manufacturing has excess capacity. The following per unit data apply for sales to regular customers:

*Variable costs:*

Direct materials $40

Direct labor 20

Manufacturing support 35

Marketing costs 15

*Fixed costs:*

Manufacturing support 45

Marketing costs 15

Total costs 170

Markup (50%) 85

Targeted selling price $255

66. What is the full cost of the product per unit?

a. $110

b. $170

c. $255

d. $85

*Answer*: b

$40 + $20 + $35 + $15 + $45 + $15 = $170

67. What is the contribution margin per unit?

a. $85

b. $110

c. $145

d. $255

*Answer*: c

$255 – ($40 + $20 + $35 + $15) = $145

68. For Welch Manufacturing, what is the minimum acceptable price of this special order?

a. $110

b. $145

c. $170

d. $255

*Answer*: a

$40 + $20 + $35 + $15 = $110

69. What is the change in operating profits if the 1,000 unit one-time-only special order is accepted for $180 a unit by Welch?

a. $70,000 increase in operating profits

b. $10,000 increase in operating profits

c. $10,000 decrease in operating profits

d. $75,000 decrease in operating profits

*Answer*: a

$180 – ($40 + $20 + $35 + $15) = $70; 1,000 x $70 = $70,000 increase

70. Ratzlaff Company has a current production level of 20,000 units per month. Unit costs at this level are:

Direct materials $0.25

Direct labor 0.40

Variable overhead 0.15

Fixed overhead 0.20

Marketing - fixed 0.20

Marketing/distribution - variable 0.40

Current monthly sales are 18,000 units. Jim Company has contacted Ratzlaff Company about purchasing 1,500 units at $2.00 each. Current sales would not be affected by the one-time-only special order, and variable marketing/distribution costs would not be incurred on the special order. What is Ratzlaff Company’s change in operating profits if the special order is accepted?

a. $400 increase in operating profits

b. $400 decrease in operating profits

c. $1,800 increase in operating profits

d. $1,800 decrease in operating profits

*Answer*: c

Manufacturing cost per unit = $0.25 + $0.40 + $0.15 = $0.80

1,500 x ($2.00 - $0.80) = $1,800 increase

71. Black Tool Company has a production capacity is 1,500 units per month, but current production is only 1,250 units. The manufacturing costs are $60 per unit and marketing costs are $16 per unit. Doug Hall offers to purchase 250 units at $76 each for the next five months. Should Black accept the one-time-only special order if only absorption-costing data are available?

a. Yes, good customer relations are essential.

b. No, the company will only break even.

c. No, since only the employees will benefit.

d. Yes, since operating profits will most likely increase.

*Answer*: d

Since the $60 absorption cost per unit is most likely not all variable costs and since the entire $16 per unit of marketing costs may not be incurred, operating profits will most likely increase.

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 72 THROUGH 75.

Grant’s Kitchens is approached by Ms. Tammy Wang, a new customer, to fulfill a large one-time-only special order for a product similar to one offered to regular customers. The following per unit data apply for sales to regular customers:

Direct materials $455

Direct labor 300

Variable manufacturing support 45

Fixed manufacturing support 100

Total manufacturing costs 900

Markup (60%) 540

Targeted selling price $1440

Grant’s Kitchens has excess capacity. Ms. Wang wants the cabinets in cherry rather than oak, so direct material costs will increase by $30 per unit.

72. For Grant’s Kitchens, what is the minimum acceptable price of this one-time-only special order?

a. $830

b. $930

c. $785

d. $1440

*Answer*: a

$455 + $300 + $45 + $30 = $830

73. Other than price, what other items should Grant’s Kitchens consider before accepting this one-time-only special order?

a. Reaction of shareholders

b. Reaction of existing customers to the lower price offered to Ms. Wang

c. Demand for cherry cabinets

d. Price is the only consideration.

*Answer*: b

74. If Ms. Wang wanted a long-term commitment for supplying this product, this analysis

a. would definitely be different.

b. may be different.

c. would not be different.

d. does not contain enough information to determine if there would be a difference.

*Answer*: a

75. If there was limited capacity, all of the following amounts would change EXCEPT

a. opportunity costs.

b. differential costs.

c. variable costs.

d. the minimum acceptable price.

*Answer*: c

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 76 AND 77.

Northwoods manufactures rustic furniture. The cost accounting system estimates manufacturing costs to be $90 per table, consisting of 80% variable costs and 20% fixed costs. The company has surplus capacity available. It is Northwoods’ policy to add a 50% markup to full costs.

76. Northwoods is invited to bid on a one-time-only special order to supply 100 rustic tables. What is the lowest price Northwoods should bid on this special order?

a. $6,300

b. $7,200

c. $9,000

d. $13,500

*Answer*: b

$90 x 80% x 100 tables = $7,200

77. A large hotel chain is currently expanding and has decided to decorate all new hotels using the rustic style. Northwoods Incorporated is invited to submit a bid to the hotel chain. What is the lowest price per unit Northwoods should bid on this long-term order?

a. $63

b. $72

c. $90

d. $135

*Answer*: d

$90 + ($90 x 50%) = $135

78. Cochran Corporation has a plant capacity of 100,000 units per month. Unit costs at capacity are:

Direct materials $4.00

Direct labor 6.00

Variable overhead 3.00

Fixed overhead 1.00

Marketing - fixed 7.00

Marketing/distribution - variable 3.60

Current monthly sales are 95,000 units at $30.00 each. Suzie, Inc., has contacted Cochran Corporation about purchasing 2,000 units at $24.00 each. Current sales would not be affected by the one-time-only special order. What is Cochran’s change in operating profits if the one-time-only special order is accepted?

a. $14,800 increase

b. $17,200 increase

c. $22,000 increase

d. $33,200 increase

*Answer*: a

($4.00 + 6.00 + 3.00 + 3.60) = $16.60

($24.00 – 16.60) x 2,000 = $14,800 increase

79. The sum of all the costs incurred in a particular business function (for example, marketing) is called the

a. business function cost.

b. full product cost.

c. gross product cost.

d. multiproduct cost.

*Answer*: a

80. The sum of all costs incurred in all business functions in the value chain (product design, manufacturing, marketing, and customer service, for example) is known as the

a. business cost.

b. full product cost.

c. gross product cost.

d. multiproduct cost.

*Answer*: b

81. Problems that should be avoided when identifying relevant costs include all EXCEPT

a. assuming all variable costs are relevant.

b. assuming all fixed costs are irrelevant.

c. using unit costs that do not separate variable and fixed components.

d. using total costs that separate variable and fixed components.

*Answer*: d

82. The BEST way to avoid misidentification of relevant costs is to focus on

a. expected future costs that differ among the alternatives.

b. historical costs.

c. unit fixed costs.

d. total unit costs.

*Answer*: a

83. Factors used to decide whether to outsource a part include

a. the supplier’s cost of direct materials.

b. if the supplier is reliable.

c. the original cost of equipment currently used for production of that part.

d. past design costs used to develop the current composition of the part.

*Answer*: b

84. Relevant costs of a make-or-buy decision include all EXCEPT

a. fixed salaries that will not be incurred if the part is outsourced.

b. current direct material costs of the part.

c. special machinery for the part that has no resale value.

d. material-handling costs that can be eliminated.

*Answer*: c

85. Which of following are risks of outsourcing the production of a part?

a. Unpredictable quality

b. Unreliable delivery

c. Unscheduled price increases

d. All of the above are risks of outsourcing.

*Answer*: d

86. Which of the following minimize the risks of outsourcing?

a. The use of short-term contracts that specify price

b. The responsibility for on-time delivery is now the responsibility of the supplier

c. Building close relationships with the supplier

d. All of the above minimize the risks of outsourcing.

*Answer*: c

87. The cost to produce Part A was $10 per unit in 20x3 and in 20x4 has increased to $11 per unit. In 20x4, Supplier XYZ has offered to supply Part A for $9 per unit. For the make-or-buy decision,

a. incremental revenues are $2 per unit.

b. incremental costs are $1 per unit.

c. net relevant costs are $1 per unit.

d. differential costs are $2 per unit.

*Answer*: d

88. When evaluating a make-or-buy decision, which of the following does NOT need to be considered?

a. Alternative uses of the production capacity

b. The original cost of the production equipment

c. The quality of the supplier's product

d. The reliability of the supplier's delivery schedule

*Answer*: b

89. For make-or-buy decisions, a supplier's ability to deliver the item on a timely basis is considered

a. a qualitative factor.

b. a relevant cost.

c. a differential factor.

d. an opportunity cost.

*Answer*: a

90. The incremental costs of producing one more unit of product include all of the following EXCEPT

a. direct materials.

b. direct labor.

c. variable overhead costs.

d. fixed overhead costs.

*Answer*: d

91. Direct materials $40, direct labor $10, variable overhead costs $30, and fixed overhead costs $20. In the short term, the incremental cost of one unit is

a. $30.

b. $50.

c. $80.

d. $100.

*Answer*: c

92. Unit cost data can MOST mislead decisions by

a. not computing fixed overhead costs.

b. computing labor and materials costs only.

c. computing administrative costs.

d. not computing unit costs at the same output level.

*Answer*: d

93. Schmidt Sewing Company incorporates the services of Deb's Sewing. Schmidt purchases pre-cut dresses from Deb's. This is primarily known as

a. insourcing.

b. outsourcing.

c. relevant costing.

d. sunk costing.

*Answer*: b

94. Pearce Sign Company manufactures signs from direct materials to the finished product. This is considered

a. insourcing.

b. outsourcing.

c. relevant costing.

d. sunk costing.

*Answer*: a

95. Which of the following would NOT be considered in a make-or-buy decision?

a. Fixed costs that will no longer be incurred

b. Variable costs of production

c. Potential rental income from space occupied by the production area

d. Unchanged supervisory costs

*Answer*: d

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 96 THROUGH 98.

Konrade’s Engine Company manufactures part TE456 used in several of its engine models. Monthly production costs for 1,000 units are as follows:

Direct materials $ 40,000

Direct labor 10,000

Variable overhead costs 30,000

Fixed overhead costs 20,000

Total costs $100,000

It is estimated that 10% of the fixed overhead costs assigned to TE456 will no longer be incurred if the company purchases TE456 from the outside supplier. Konrade’s Engine Company has the option of purchasing the part from an outside supplier at $85 per unit.

96. If Konrade’s Engine Company accepts the offer from the outside supplier, the monthly avoidable costs (costs will no longer be incurred) total

a. $ 82,000.

b. $ 98,000.

c. $ 50,000.

d. $100,000.

*Answer*: a

$40,000 + $10,000 + $30,000 + ($20,000 x 10%) = $82,000

97. If Konrade’s Engine Company purchases 1,000 TE456 parts from the outside supplier per month, then its monthly operating income will

a. increase by $2,000.

b. increase by $80,000.

c. decrease by $3,000.

d. decrease by $85,000.

*Answer*: c

Avoidable costs $82,000 – ($85 x 1,000 units) = decrease of $3,000

98. The *maximum* price that Konrade’s Engine Company should be willing to pay the outside supplier is

a. $80 per TE456 part.

b. $82 per TE456 part.

c. $98 per TE456 part.

d. $100 per TE456 part.

*Answer*: b

Avoidable costs $82,000 / 1,000 units = $82 per part

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 99 AND 100.

Schmidt Corporation produces a part that is used in the manufacture of one of its products. The costs associated with the production of 10,000 units of this part are as follows:

Direct materials $ 45,000

Direct labor 65,000

Variable factory overhead 30,000

Fixed factory overhead 70,000

Total costs $210,000

Of the fixed factory overhead costs, $30,000 is avoidable.

99. Phil Company has offered to sell 10,000 units of the same part to Schmidt Corporation for $18 per unit. Assuming there is no other use for the facilities, Schmidt should

a. make the part as this would save $3 per unit.

b. buy the part as this would save $3 per unit.

c. buy the part as this would save the company $30,000.

d. make the part as this would save $1 per unit.

*Answer*: d

Avoidable costs total $170,000 = $45,000 + $65,000 + $30,000 + $30,000.

$18 - $170,000/10,000 = $1

100. Assuming no other use of their facilities, the highest price that Schmidt should be willing to pay for 10,000 units of the part is

a. $210,000.

b. $140,000.

c. $170,000.

d. $180,000.

*Answer*: c

$45,000 + $65,000 + $30,000 + $30,000 = $170,000

101. Relevant costs in a make-or-buy decision of a part include

a. setup overhead for the manufacture of the product using the outsourced part.

b. currently used manufacturing capacity that has alternative uses.

c. annual plant insurance costs that will remain the same.

d. corporate office costs that will be allocated differently.

*Answer*: b

102. If Horsley Corporation doesn't use one of its limited resources in the best possible way, the lost contribution to income could be called

a. a variable cost.

b. a fixed cost.

c. an opportunity cost.

d. a sunk cost.

*Answer*: c

103. When a firm has constrained capacity as opposed to surplus capacity, opportunity costs will be

a. lower.

b. the same.

c. greater.

d. it varies.

*Answer*: c

104. Opportunity costs

a. result in a cash outlay.

b. only are considered when selecting among alternatives.

c. are recorded in the accounting records.

d. should be maximized for the best decision.

*Answer*: b

105. Opportunity cost(s)

a. of a resource with excess capacity is zero.

b. should be maximized by organizations.

c. are recorded as an expense in the accounting records.

d. are most important to financial accountants.

*Answer*: a

106. For make-or-buy decisions, relevant costs include

a. direct material costs plus direct labor costs.

b. incremental costs plus opportunity costs.

c. differential costs plus fixed costs.

d. incremental costs plus differential costs.

*Answer*: b

107. The opportunity cost of holding significant inventory includes

a. the interest forgone on an alternative investment.

b. additional insurance costs.

c. additional storage costs.

d. all of the above.

*Answer*: a

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 108 AND 109.

Stephans Corporation currently manufactures a subassembly for its main product. The costs per unit are as follows:

Direct materials $ 1.00

Direct labor 10.00

Variable overhead 5.00

Fixed overhead 8.00

Total $24.00

Bill Company has contacted Stephans with an offer to sell them 5,000 of the subassemblies for $22.00 each. Stephans will eliminate $25,000 of fixed overhead if it accepts the proposal.

108. What are the relevant costs for Stephans?

a. $140,000

b. $125,000

c. $105,000

d. $80,000

*Answer*: c

($1 + 10 + 5) x 5,000 + $25,000 = $105,000

109. Should Stephans make or buy the subassemblies? What is the difference between the two alternatives?

a. Buy; savings = $20,000

b. Buy; savings = $50,000

c. Make; savings = $60,000

d. Make; savings = $5,000

*Answer*: d

Cost to buy: 5,000 x $22 = $110,000

Cost to make: $110,000 - 105,000 = $5,000 \*\* make

110. A recent college graduate has the choice of buying a new auto for $20,000 or investing the money for four years with a 6% expected rate of return. If the graduate decides to purchase the auto, the BEST estimate of the opportunity cost of that decision is

a. $1,200.

b. $4,800.

c. $20,000.

d. zero since there is no opportunity cost for this decision.

*Answer*: b

$20,000 x 6% x 4 years = $4,800 cost of the opportunity not chosen.

111. A supplier offers to make Part A for $70. Jansen Company has relevant costs of $80 a unit to manufacture Part A. If there is excess capacity, the opportunity cost of buying Part A from the supplier

a. is zero.

b. is $10,000.

c. is $70,000.

d. cannot be determined using the above information.

*Answer*: a

112. Jensen Company has relevant costs of $80 per unit to manufacture Part A. A current supplier offers to make Part A for $70 per unit. If capacity is constrained, the opportunity cost of buying Part A from the supplier

a. is zero.

b. is $10,000.

c. is $70,000.

d. cannot be determined using the above information.

*Answer*: d

Information regarding alternative uses for the capacity would determine the opportunity cost.

113. Determining which products should be produced when the plant is operating at full capacity is referred to as

a. an outsourcing analysis.

b. production scheduling analysis.

c. a product-mix decision.

d. a short-run focus decision.

*Answer*: c

114. Product mix decisions

a. have a long-run focus.

b. help determine how to maximize operating profits.

c. focus on selling price per unit.

d. are all of the above.

*Answer*: b

115. Constraints may include

a. the availability of direct materials in manufacturing.

b. linear square feet of display space for a retailer.

c. direct labor in the service industry.

d. all of the above.

*Answer*: d

116. For determining the best mix of products, the one with the LEAST amount of influence is

a. the market price of the products.

b. corporate office costs allocated to each product.

c. the use of capacity resources.

d. contribution margins.

*Answer*: b

117. In product-mix decisions,

a. always focus on maximizing total contribution margin.

b. focus on the product with the greatest contribution margin per machine-hour.

c. focus on the full costs of the product.

d. never focus on the short-term, but include only long-term considerations.

*Answer*: a

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 118 THROUGH 122.

Braun’s Brakes manufactures three different product lines, Model X, Model Y, and Model Z. Considerable market demand exists for all models. The following per unit data apply:

**Model X Model Y Model Z**

Selling price $50 $60 $70

Direct materials 6 6 6

Direct labor ($12 per hour) 12 12 24

Variable support costs ($4 per machine-hour) 4 8 8

Fixed support costs 10 10 10

118. Which model has the greatest contribution margin per unit?

a. Model X

b. Model Y

c. Model Z

d. Both Models X and Y

*Answer*: b

Model X $50 - $6 - $12 - $4 = $28

Model Y $60 - $6 - $12 - $8 = $34 \*\*highest

Model Z $70 - $6 - $24 - $8 = $32

119. Which model, has the greatest contribution margin per machine-hour?

a. Model X

b. Model Y

c. Model Z

d. Both Models Y and Z

*Answer*: a

Model X $50 - $6 - $12 - $4 = $28 / 1 = $28 \*\*highest

Model Y $60 - $6 - $12 - $8 = $34 / 2 = $17

Model Z $70 - $6 - $24 - $8 = $32 / 2 = $16

120. If there is excess capacity, which model is the most profitable to produce?

a. Model X

b. Model Y

c. Model Z

d. Both Models X and Y

*Answer*: b

Model Y since it has the greatest contribution margin per unit

121. If there is a machine breakdown, which model is the most profitable to produce?

a. Model X

b. Model Y

c. Model Z

d. Both Models Y and Z

*Answer*: a

Model X since it has the greatest contribution margin per machine-hour

122. How can Lisa Braun encourage her salespeople to promote the more profitable model?

a. Put all sales persons on salary

b. Provide higher sales commissions for higher priced items

c. Provide higher sales commissions for items with the greatest contribution margin per constrained resource

d. Both (b) and (c)

*Answer*: c

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 123 THROUGH 125.

Helmer’s Rockers manufactures two models, Standard and Premium. Weekly demand is estimated to be 100 units of the Standard Model and 70 units of the Premium Model. The following per unit data apply:

**Standard Premium**

Contribution margin per unit $18 $20

Number of machine-hours required 3 4

123. The contribution per machine-hour is

a. $18 for Standard, $20 for Premium.

b. $54 for Standard, $80 for Premium.

c. $15 for Standard, $16 for Premium.

d. $6 for Standard, $5 for Premium.

*Answer*: d

Standard $18 / 3 = $6; Premium $20 / 4 = 5

124. If there are 496 machine-hours available per week, how many rockers of each model should Jim Helmer produce to maximize profits?

a. 100 units of Standard and 49 units of Premium

b. 72 units of Standard and 70 units of Premium

c. 100 units of Standard and 70 units of Premium

d. 85 units of Standard and 60 units of Premium

*Answer*: a

Standard (100 units x 3mh) + Premium (49 units x 4 mh) = 496 machine-hours of the constrained resource

125. If there are 600 machine-hours available per week, how many rockers of each model should Jim Helmer produce to maximize profits?

a. 100 units of Standard and 49 units of Premium

b. 72 units of Standard and 70 units of Premium

c. 100 units of Standard and 70 units of Premium

d. 85 units of Standard and 60 units of Premium

*Answer*: c

Standard (100 units x 3mh) + Premium (70 units x 4 mh) = 580 machine-hours for the current demand

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 126 THROUGH 128.

Raines Company manufactures three sizes of kitchen appliances: small, medium, and large. Product information is provided below.

Small Medium Large

Unit selling price $150 $250 $500

Unit costs:

Variable manufacturing (60) (120) (200)

Fixed manufacturing (40) (50) (120)

Variable selling and administrative (30) (30) (30)

Unit profit $ 20 $ 50 $150

Demand in units 100 120 100

Machine-hours per unit 20 40 100

The maximum machine-hours available are 6,000 per week.

126. What is the contribution margin per machine-hour for a large chair?

a. $5.00

b. $3.00

c. $2.70

d. $1.80

*Answer*: c

$500 - $200 - $30 = $270

$270 / 100 = $2.70

127. Which of the three product models should be produced first if management incorporates a short-run profit maximizing strategy?

a. Small chairs

b. Medium chairs

c. Large chairs

d. Either medium or large chairs

*Answer*: a

Small ($150 - $60 - $30) = $60 / 20 = $3.00 \*\*highest

Medium ($250 - $120 - $30) = $100 / 40 = $2.50

Large ($500 - $200 - $30) = $270 / 100 = $2.70

128. How many of each product should be produced per month using the short-run profit maximizing strategy?

Small Medium Large

a. 0 120 12

b. 100 0 40

c. 100 100 0

d. 100 20 40

*Answer*: b

Small (100 x 20) + Large (40 x 100) = 6,000 total machine-hours

129. When deciding whether to discontinue a segment of a business, managers should focus on

a. equipment used by that segment that could become idle.

b. reallocation of corporate costs.

c. how total costs differ among alternatives.

d. operating income per unit of the discontinued segment.

*Answer*: c

130. When deciding whether to discontinue a segment of a business, relevant costs include all EXCEPT

a. fixed supervision costs that can be eliminated.

b. variable marketing costs per unit of product sold.

c. cost of goods sold.

d. future administrative costs that will continue.

*Answer*: d

131. Discontinuing unprofitable products will increase profitability

a. if the resources no longer required by the discontinued product can be eliminated.

b. if capacity constraints are adjusted.

c. automatically.

d. when a large portion of the fixed costs are unavoidable.

*Answer*: a

132. Camera Corner is considering eliminating Model AE2 from its camera line because of losses over the past quarter. The past three months of information for Model AE2 are summarized below.

Sales (1,000 units) $300,000

Manufacturing costs:

Direct materials 150,000

Direct labor ($15 per hour) 60,000

Overhead 100,000

Operating loss ($10,000)

Overhead costs are 70% variable and the remaining 30% is depreciation of special equipment for model AE2 that has no resale value.

If Model AE2 is dropped from the product line, operating income will

a. increase by $10,000.

b. decrease by $20,000.

c. increase by $30,000.

d. decrease by $10,000.

*Answer*: b

300,000 - $150,000 - $60,000 - $70,000 = $20,000 This product contributes $20,000 toward corporate profits, therefore, discontinuing this product will decrease operating income by $20,000.

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 133 AND 134.

The management accountant for Martha’s Book Store has prepared the following income statement for the most current year.

**Cookbook Travel Book Classics** **Total**

Sales $60,000 $100,000 $40,000 $200,000

Cost of goods sold 36,000 65,000 20,000 121,000

Contribution margin 24,000 35,000 20,000 79,000

### Order and delivery processing 18,000 21,000 8,000 47,000

Rent (per sq. foot used) 2,000 1,000 3,000 6,000

Allocated corporate costs 7,000 7,000 7,000 21,000

Corporate profit $ (3,000) $ 6,000 $ 2,000 $ 5,000

133. If the cookbook product line had been discontinued prior to this year, the company would have reported

a. greater corporate profits.

b. the same amount of corporate profits.

c. less corporate profits.

d. resulting profits cannot be determined.

*Answer*: c

$60,000 - $36,000 - $18,000 - $2,000 = $4,000

The cookbook product line contributed $4,000 toward corporate profits. Without the cookbooks, corporate profits would be $4,000 less than currently reported.

134. If the travel book line had been discontinued, corporate profits for the current year would have decreased by

a. $35,000.

b. $14,000.

c. $13,000.

d. $6,000.

*Answer*: c

$100,000 - $65,000 - $21,000 - $1,000 = $13,000

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 135 AND 136.

Denly Company has three products, A, B, and C. The following information is available:

Product A Product B Product C

Sales $60,000 $90,000 $24,000

Variable costs 36,000 48,000 15,000

Contribution margin 24,000 42,000 9,000

Fixed costs:

Avoidable 9,000 18,000 6,000

Unavoidable 6,000 9,000 5,400

Operating income $ 9,000 $15,000 $ (2,400)

135. Denly Company is thinking of dropping Product C because it is reporting a loss. Assuming Denly drops Product C and does not replace it, operating income will

a. increase by $2,400.

b. increase by $3,000.

c. decrease by $3,000.

d. decrease by $5,400.

*Answer*: c

$24,000 - $15,000 - $6,000 = $3,000. Product C contributes $3,000 toward corporate profits. Without Product C, operating income would be $3,000 less than currently reported.

136. Assuming Product C is discontinued and the space formerly used to produce Product C is rented for $12,000 per year, operating income will

a. increase by $6,600.

b. increase by $9,000.

c. increase by $12,000.

d. increase by $14,400.

*Answer*: b

$(3,000) + $12,000 = $9,000

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 137 AND 138.

Melodee’s Preserves currently makes jams and jellies and a variety of decorative jars used for packaging. An outside supplier has offered to supply all of the needed decorative jars. For this make-or-buy decision, a cost analysis revealed the following avoidable unit costs for the decorative jars:

Direct materials $0.25

Direct labor 0.03

Unit-related support costs 0.10

Batch-related support costs 0.12

Product-sustaining support costs 0.22

Facility-sustaining support costs 0.28

Total cost per jar $1.00

137. The relevant cost per jar is

a. $0.28 per jar.

b. $0.38 per jar.

c. $0.72 per jar.

d. $1.00 per jar.

*Answer*: d *Objectives*: 4, 7

All avoidable costs are relevant for this decision.

138. The maximum price that Melodee’s Preserves should be willing to pay for the decorative jars is

a. $0.28 per jar.

b. $0.38 per jar.

c. $0.72 per jar.

d. $1.00 per jar.

*Answer*: d *Objectives*: 4, 7

Considering only quantitative factors, the company should not pay more than the avoidable costs of $1.00 per jar. There may be qualitative factors that are also important.

139. Costs are relevant to a particular decision if they

a. are variable costs.

b. are fixed costs.

c. differ across the alternatives being considered.

d. remain unchanged across the alternatives being considered.

*Answer*: c

140. When deciding to lease a new cutting machine or continue using the old machine, the following costs are relevant EXCEPT the

a. $50,000 cost of the old machine.

b. $20,000 cost of the new machine.

c. $10,000 selling price of the old machine.

d. $3,000 annual savings in operating costs if the new machine is purchased.

*Answer*: a

141. For machine-replacement decisions, depreciation is a cost that is

a. not relevant.

b. differential.

c. incremental.

d. variable.

*Answer*: a

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 142 THROUGH 144.

Flowers For Everyone is considering replacing its existing delivery van with a new one. The new van can offer considerable savings in operating costs. Information about the existing van and the new van follow:

**Existing van New van**

Original cost $100,000 $180,000

Annual operating cost $ 35,000 $ 20,000

Accumulated depreciation $ 60,000 ---

Current salvage value of the existing van $ 45,000 ---

Remaining life 10 years 10 years

Salvage value in 10 years $ 0 $ 0

Annual depreciation $ 4,000 $ 18,000

142. Sunk costs include

a. the original cost of the existing van.

b. the original cost of the new van.

c. the current salvage value of the existing van.

d. the annual operating cost of the new van.

*Answer*: a

143. Relevant costs for this decision include

a. the original cost of the existing van.

b. accumulated depreciation.

c. the current salvage value.

d. the salvage value in 10 years.

*Answer*: c

144. If Flowers For Everyone replaces the existing delivery van with the new one, over the next 10 years operating income will

a. decrease by $180,000.

b. increase by $150,000.

c. decrease by $150,000.

d. none of the above.

*Answer*: b

New van ($20,000 x 10 years) - Existing van ($35,000 x 10 years) = $150,000 less in operating costs, which results in a $150,000 increase in operating income.

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 145 THROUGH 147.

Frederick, Inc., is considering replacing a machine. The following data are available:

Replacement

Old Machine Machine

Original cost $45,000 $35,000

Useful life in years 10 5

Current age in years 5 0

Book value $25,000 ‑

Disposal value now $8,000 ‑

Disposal value in 5 years 0 0

Annual cash operating costs $7,000 $4,000

145. Which of the data provided in the table is a sunk cost?

a. The annual cash operating costs of the old machine

b. The annual cash operating costs of the replacement machine

c. The disposal value of the old machine

d. The original cost of the old machine

*Answer*: d

146. For the decision to keep the old machine, the relevant costs of keeping the old machine total

a. $60,000.

b. $35,000.

c. $47,000.

d. $72,000.

*Answer*: b

$7,000 x 5 = $35,000

147. The difference between keeping the old machine and replacing the old machine is

a. $37,000 in favor of keeping the old machine.

b. $12,000 in favor of keeping the old machine.

c. $37,000 in favor of replacing the old machine.

d. $12,000 in favor of replacing the old machine.

*Answer*: b

New [$35,000 + (5 x $4,000)] – Old [$8,000 + (5 x $7,000)] = $12,000

148. Managers tend to favor the alternative that makes their performance look best. Therefore, they tend to focus on

a. how to implement the chosen alternative.

b. the measures used in the decision model.

c. the measures used in the performance evaluation model.

d. gathering the required information.

*Answer*: c

149. If management takes a multiple-year view in the decision model and judges success according to the current year's results, a problem will occur in the

a. decision model.

b. performance evaluation model.

c. production evaluation model.

d. quantitative model.

*Answer*: b

150. The three steps involved in linear programming include all of the following EXCEPT

a. determining the objective.

b. determining the basic relationship.

c. computing the optimal solution.

d. determining the relevant and irrelevant costs.

*Answer*: d *Objective*: A

151. In linear programming, the goals of management are expressed in

a. an objective function.

b. constraints.

c. operating policies.

d. business functions.

*Answer*: a *Objective*: A

152. A mathematical inequality or equality that must be appeased is known as

a. an objective function.

b. a constraint.

c. an operating policy.

d. a business function.

*Answer*: b *Objective*: A

153. Computer Products produces two keyboards, Regular and Special. Regular keyboards have a unit contribu­tion margin of $128, and Special keyboards have a unit contribution margin of $720. The demand for Regulars exceeds Computer Product’s production capacity, which is limited by available machine-hours and direct manufacturing labor-hours. The maximum demand for Special keyboards is 80 per month. Management desires a product mix that will maximize the contri­bution toward fixed costs and profits.

Direct manufacturing labor is limited to 1,600 hours a month and machine-hours are limited to 1,200 a month. The Regular keyboards require 20 hours of labor and 8 machine-hours. Special keyboards require 34 labor-hours and 20 machine-hours.

Let R represent Regular keyboards and S represent Special keyboards. The correct set of equations for the keyboard production process is

a. Maximize: $128R + $720S

Constraints:

Labor-hours: 20R + 34S ≤ 1,600

Machine-hours: 8R + 20S ≤ 1,200

Special: S ≤ 80

S ≥ 0

Regular: R ≥ 0

b. Maximize: $128R + $720S

Constraints:

Labor-hours: 20R + 34S ≥ 1,600

Machine-hours: 8R + 20S ≥≤ 1,200

Special: S ≥ 80

S ≥ 0

Regular: R ≥ 0

c. Maximize: $720S + $128R

Constraints:

Labor-hours: 20R + 8S ≤ 1,600

Machine-hours: 34R + 20S ≤ 1,200

Special: S ≤ 80

S ≥ 0

Regular: R ≥ 0

d. Maximize: $128R + $720S

Constraints:

Labor-hours: 20R + 34S ≤ 1,600

Machine-hours: 8R + 20S ≤ 1,200

Special: S ≥ 80

S ≤ 0

Regular: R ≤ 0

*Answer*: a *Objective*: A

*EXERCISES AND PROBLEMS*

154. Fluty Corporation manufactures a product that has two parts, A and B. It is currently considering two alternative proposals related to these parts.

The first proposal is for buying Part A. This would free up some of the plant space for the manufacture of more of Part B and assembly of the final product. The product vice president believes the additional production of the final product can be sold at the current market price. No other changes in manufacturing would be needed.

The second proposal is for buying new equipment for the production of Part B. The new equipment requires fewer workers and uses less power to operate. The old equipment has a net disposal value of zero.

**Required:**

Tell whether the following items are relevant or irrelevant for each proposal. Treat each proposal independently.

a. Total variable manufacturing overhead, Part A

b. Total variable manufacturing overhead, Part B

c. Cost of old equipment for manufacturing Part B

d. Cost of new equipment for manufacturing Part B

e. Total variable selling and administrative costs

f. Sales revenue of the product

g. Total variable costs of assembling final products

h. Total direct manufacturing materials, Part A

i. Total direct manufacturing materials, Part B

j. Total direct manufacturing labor, Part A

k. Total direct manufacturing labor, Part B

**Answer**: *Proposal 1**Proposal 2*

a. R I

b. R R

c. I I

d. I R

e. R I

f. R I

g. R I

h. R I

i. R I

j. R I

k. R R

*Difficulty*: 2 *Objective*: 2

155. Axle and Wheel Manufacturing is approached by a European customer to fulfill a one-time-only special order for a product similar to one offered to domestic customers. The following per unit data apply for sales to regular customers:

Direct materials $33

Direct labor 15

Variable manufacturing support 24

Fixed manufacturing support 52

Total manufacturing costs 124

Markup (50%) 62

Targeted selling price $186

Axle and Wheel Manufacturing has excess capacity.

Required:

a. What is the full cost of the product per unit?

b. What is the contribution margin per unit?

c. Which costs are relevant for making the decision regarding this one-time-only special order? Why?

d. For Axle and Wheel Manufacturing, what is the minimum acceptable price of this one-time-only special order?

e. For this one-time-only special order, should Axle and Wheel Manufacturing consider a price of $100 per unit? Why or why not?

Answer:

a. $124

b. $114 = Selling price $186 – Variable costs ($33 + $15 + $24).

c. Relevant costs for decision making are those costs that differ between alternatives, which in this situation are the incremental costs. The incremental costs total $72 = Variable costs ($33 + $15 + $24).

d. The minimum acceptable price is $72 = Variable costs ($33 + $15 + $24), the incremental costs in the short tem.

e. Yes, because this price is greater than the minimum acceptable price of this special order determined in (d).

*Objectives*: 2, 3

156. Silver Lake Cabinets is approached by Ms. Jenny Zhang, a new customer, to fulfill a large one-time-only special order for a product similar to one offered to regular customers. The following per unit data apply for sales to regular customers:

Direct materials $100

Direct labor 125

Variable manufacturing support 60

Fixed manufacturing support 75

Total manufacturing costs 360

Markup (60%) 216

Targeted selling price $576

Silver Lake Cabinets has excess capacity. Ms. Zhang wants the cabinets in cherry rather than oak, so direct material costs will increase by $30 per unit.

Required:

a. For Silver Lake Cabinets, what is the minimum acceptable price of this one-time-only special order?

b. Other than price, what other items should Silver Lake Cabinets consider before accepting this one-time-only special order?

c. How would the analysis differ if there was limited capacity?

Answer:

a. $315 = Variable costs ($100 + $125 + $60) + $30 additional cost for cherry.

b. Silver Lake Cabinets should also consider the impact on current customers when these customers hear that another customer was offered a discounted price, and the impact on the competition and if they might choose to meet the discounted price.

c. Currently, the incremental costs total $315. If additional capacity is needed to process this order, these incremental costs will increase by the cost of adding capacity.

*Objectives*: 2, 3, 4

157. Quiett Truck manufactures part WB23 used in several of its truck models. 10,000 units are produced each year with production costs as follows:

Direct materials $ 45,000

Direct manufacturing labor 15,000

Variable support costs 35,000

Fixed support costs 25,000

Total costs $120,000

Quiett Truck has the option of purchasing part WB23 from an outside supplier at $11.20 per unit. If WB23 is outsourced, 40% of the fixed costs cannot be immediately converted to other uses.

a. Describe avoidable costs. What amount of the WB23 production costs is avoidable?

b. Should Quiett Truck outsource WB23? Why or why not?

c. What other items should Quiett Truck consider before outsourcing any of the parts it currently manufactures?

Answer:

a. Avoidable costs are those costs eliminated when a part, product, product line, or business segmented is discontinued. Avoidable production costs for WB23 total $110,000, which are all but the $10,000 ($25,000 x 40%) of fixed costs that cannot be immediately converted to other uses.

b. Based on the financial considerations given, Quiett Truck should NOT outsource WB23 because the $112,000 (10,000 units x $11.20 per part) outsourced cost is greater than the $110,000 reduction in annual production costs. In other words, the outsourcing would cost Quiett Truck an additional $2,000 annually.

c. Other factors to consider include the supplier’s ability to meet expected quality and delivery standards, and the likelihood of suppliers increasing prices of components in the future.

158. Southwestern Company needs 1,000 motors in its manufacture of automobiles. It can buy the motors from Jinx Motors for $1,250 each. Southwestern’s plant can manufacture the motors for the following costs per unit:

Direct materials $ 500

Direct manufacturing labor 250

Variable manufacturing overhead 200

Fixed manufacturing overhead 350

Total $1,300

If Southwestern buys the motors from Jinx, 70% of the fixed manufacturing overhead applied will not be avoided.

**Required:**

a. Should the company make or buy the motors?

b. What additional factors should Southwestern consider in deciding whether or not to make or buy the motors?

**Answer:**

a. *Cost to buy the part*: (1,000 x $1,250) $1,250,000

*Relevant costs to make*:

Variable costs:

Direct materials (1,000 x $500) $500,000

### Direct manufacturing. labor (1,000 x $250) 250,000

Variable manufacturing overhead (1,000 x $200) 200,000

### Total $950,000

Avoidable fixed costs: ($350 x 1,000 x 0.30) 105,000 1,055,000

*Savings if part is manufactured* $ 195,000

b. Management should consider several qualitative factors in deciding whether to make or buy the motors.

* + - *Quality controls* The company's ability to manufacture quality motors versus that of the supplier.
    - *Delivery* Can they make them when needed versus Jinx delivering them when needed?
    - *Reputation* What is the overall reputation of Jinx?
    - *Term* Is Jinx willing to make long-term commitments for delivery of the motors?
    - *Facilities* What are the opportunity costs of using the space and equipment to manufacture other items?

*Difficulty*: 2 *Objective*: 4

159. Kirkland Company manufactures a part for use in its production of hats. When 10,000 items are produced, the costs per unit are:

### Direct materials $0.60

Direct manufacturing labor 3.00

Variable manufacturing overhead 1.20

Fixed manufacturing overhead 1.60

Total $6.40

Mike Company has offered to sell to Kirkland Company 10,000 units of the part for $6.00 per unit. The plant facilities could be used to manufacture another item at a savings of $9,000 if Kirkland accepts the offer. In addition, $1.00 per unit of fixed manufacturing overhead on the original item would be eliminated.

**Required:**

a. What is the relevant per unit cost for the original part?

b. Which alternative is best for Kirkland Company? By how much?

**Answer:**

a. Direct materials $0.60

Direct manufacturing labor 3.00

Variable manufacturing overhead 1.20

Avoidable fixed manufacturing. overhead 1.00

Total relevant per unit costs $5.80

b. **Make Buy Effect of Buying**

Purchase price $60,000 $(60,000)

Savings in space (9,000) 9,000

Direct materials $6,000 6,000

### Direct mfg. labor 30,000 30,000

Variable overhead 12,000 12,000

Fixed overhead saved (10,000) 10,000

Totals $48,000 $41,000 $7,000

The best alternative is to buy the part.

*Difficulty*: 2 *Objectives*: 4, 5, 6

160. Lewis Auto Company manufactures a part for use in its production of automobiles. When 10,000 items are produced, the costs per unit are:

### Direct materials $ 12

Direct manufacturing labor 60

Variable manufacturing overhead 24

Fixed manufacturing overhead 32

Total $128

Monty Company has offered to sell Lewis Auto Company 10,000 units of the part for $120 per unit. The plant facilities could be used to manufacture another part at a savings of $180,000 if Lewis Auto accepts the supplier’s offer. In addition, $20 per unit of fixed manufacturing overhead on the original part would be eliminated.

**Required:**

a. What is the relevant per unit cost for the original part?

b. Which alternative is best for Lewis Auto Company? By how much?

**Answer:**

a. Direct materials $12

Direct manufacturing labor 60

Variable manufacturing overhead 24

Avoidable fixed manufacturing overhead 20

Total relevant per unit costs $116

b. **Make Buy Effect of Buying**

Purchase price $1,200,000 $(1,200,000)

Savings in space (180,000) 180,000

Direct materials $120,000 120,000

### Direct manufacturing labor 600,000 600,000

Variable overhead 240,000 240,000

Fixed overhead saved (200,000) 200,000

Totals $960,000 $820,000 $140,000

The best alternative is to buy the part.

*Difficulty*: 2 *Objectives*: 4, 5, 6

161. Norton’s Mufflers manufactures three different product lines, Model X, Model Y, and Model Z. Considerable market demand exists for all models. The following per unit data apply:

**Model X** **Model Y Model Z**

Selling price $80 $90 $100

Direct materials 30 30 30

Direct labor ($10 per hour) 15 15 20

Variable support costs ($5 per machine-hour) 5 10 10

Fixed support costs 20 20 20

a. For each model, compute the contribution margin per unit.

b. For each model, compute the contribution margin per machine-hour.

c. If there is excess capacity, which model is the most profitable to produce? Why?

d. If there is a machine breakdown, which model is the most profitable to produce? Why?

e. How can Norton encourage her sales people to promote the more profitable model?

Answer:

a. The contribution margin per unit is $30 for Model X ($80 - $30 - $15 - $5),

$35 for Model Y ($90 - $30 - $15 - $10),

and $40 for Model Z ($100 - $30 - $20 - $10).

b. The contribution margin per machine-hour is

$30 for Model X ($30 contribution margin / 1.0 machine-hours per unit),

$17.50 for Model Y ($35 / 2.0), and

$20 for Model Z ($40 / 2.0).

c. When there is excess capacity, Model Y is the most profitable because it has the greatest contribution margin per unit.

d. When there are machine-hour capacity constraints, Model X is the most profitable because it has the greatest contribution margin per constrained resource.

e. To encourage sales persons to promote specific products, Norton may want to provide marketing incentives such as higher sales commissions for products contributing the most to profits. Norton may also want to educate salespeople about the effects of constrained resources.

162. Hackerott Camera is considering eliminating Model AE1 from its camera line because of losses over the past quarter. The past three months of information for model AE1 is summarized below.

Sales (1,000 units) $250,000

Manufacturing costs:

Direct materials 140,000

Direct labor ($15 per hour) 30,000

Support 100,000

Operating loss ($20,000)

Support costs are 70% variable and the remaining 30% is depreciation of special equipment for model AE1 that has no resale value.

Should Hackerott Camera eliminate Model AE1 from its product line? Why or why not?

Answer:

No, Hackerott Camera should not eliminate Model AE1 from its product line because it contributes $10,000 toward fixed costs and profits.

Sales (1,000 units) $250,000

Manufacturing costs:

Direct materials 140,000

Direct labor 30,000

Variable support ($100,000 x 70%) 70,000

Contribution margin $10,000

163. The management accountant for the Chocolate S’more Company has prepared the following income statement for the most current year.

**Chocolate Other Candy Fudge** **Total**

Sales $40,000 $25,000 $35,000 $100,000

Cost of goods sold 26,000 15,000 19,000 60,000

Contribution margin 14,000 10,000 16,000 40,000

Delivery and ordering costs 2,000 3,000 2,000 7,000

Rent (per sq. foot used) 3,000 3,000 2,000 8,000

Allocated corporate costs 5,000 5,000 5,000 15,000

Corporate profit $4,000 $(1,000) $7,000 $10,000

a. Do you recommend discontinuing the Other Candy product line? Why or why not?

b. If the Chocolate product line had been discontinued, corporate profits for the current year would have decreased by what amount?

Answer:

a. No, I would not recommend discontinuing the Other Candy product line because this product line contributes $4,000 towards corporate costs and profits.

$25,000 - $15,000 - $3,000 - $3,000 = $4,000

Without the Other Candy product line, corporate profits would be $4,000 less than currently reported.

b. If the Chocolate product line were discontinued, corporate profits would immediately decrease by $9,000.

$40,000 - $26,000 - $2,000 - $3,000 = $9,000

164. Pat, a Pizzeria manager, replaced the convection oven just six months ago. Today, Turbo Ovens Manufacturing announced the availability of a new convection oven that cooks more quickly with lower operating expenses. Pat is considering the purchase of this faster, lower-operating cost convection oven to replace the existing one they recently purchased. Selected information about the two ovens is given below:

**Existing New Turbo Oven**

Original cost $60,000 $50,000

Accumulated depreciation $ 5,000 ---

Current salvage value $40,000 ---

Remaining life 5 years 5 years

Annual operating expenses $10,000 $ 7,500

Disposal value in 5 years $ 0 $ 0

Required:

a. What costs are sunk?

b. What costs are relevant?

c. What are the net cash flows over the next 5 years assuming the Pizzeria purchases the new convection oven?

d. What other items should Pat, as manager of the Pizzeria, consider when making this decision?

Answer:

a. Sunk costs include the original cost of the existing convection oven and the accompanying accumulated depreciation.

b. Relevant costs include:

Acquisition cost of the new Turbo oven

Current disposal value of the existing convection oven

Annual operating expenses for the existing and the new Turbo oven

c. Net cash flows over 5 years with the new Turbo oven:

*Cash inflow*:

Decrease in annual operating expenses ($2,500 x 5) $ 12,500

Sale of the existing oven 40,000

*Cash outflow*:

Acquisition of the new Turbo oven (50,000)

*Net cash inflow (outflow)* $ 2,500

d. Other items the manager should consider when making this decision include:

* + 1. The Turbo oven’s reliability and efficiency is still unknown since it is a brand-new product.
    2. If the Turbo oven does bake faster as it claims, the Pizzeria may be able to increase sales due to the quicker baking time.
    3. After purchasing another oven just six months prior, top management should consider the Turbo oven option, but instead may question the decision-making ability of Pat, the current manager.

165. Local Steel Construction Company produces two products, steel and wood beams. Steel beams have a unit contribution margin of $200, and wood beams have a unit contribution margin of $150. The demand for steel beams exceeds Local Steel Construction Company's production capacity, which is limited by available direct labor and machine-hours. The maximum demand for wood beams is 90 per week. Management desires that the product mix should maximize the weekly contribution toward fixed costs and profits.

Direct manufacturing labor is limited to 3,000 hours a week and 1,000 hours is all that the company's outdated machines can run a week. The steel beams require 120 hours of labor and 60 machine-hours. Wood beams require 150 labor hours and 120 machine-hours.

**Required:**

Formulate the objective function and constraints necessary to determine the optimal product mix.

**Answer:**

S = steel beams W = wood beams

Maximize: $200S + $150W

Constraints: Labor hours: 120S + 150W < 3,000

Machine-hours: 60S + 120W < 1,000

Wood beams: W < 90

W > 0

Steel beams: S > 0

*Difficulty*: 2 *Objective*: A

*CRITICAL THINKING*

166. Explain what revenues and costs are relevant when choosing among alternatives.

Answer:

Future amounts that differ among alternatives are considered relevant. Amounts that remain the same among alternatives do not add useful information for selecting an alternative, and therefore, are not considered relevant for decision making.

167. Explain why sunk costs are not considered relevant when choosing among alternatives.

Answer:

Amounts that remain the same among alternatives do not add useful information for selecting an alternative, and therefore, are not considered relevant for decision making. Sunk costs by definition are those costs that have already been committed, cannot be changed, and will never differ among alternatives.

168. Assume you are a sophomore in college and are committed to earning an undergraduate degree. Your current decision is whether to finish college in four consecutive years or take a year off and work for some extra cash.

a. Identify at least two revenues or costs that are relevant to making this decision. Explain why each is relevant.

b. Identify at least two costs that would be considered sunk costs for this decision.

c. Comment on at least one qualitative consideration for this decision.

Answer:

a. Relevant revenues/costs are those that differ between the alternatives of continuing with college or taking a year off from college and working. Relevant costs for continuing your college education without a break include:

1. Earnings lost next year due to the hours you are not able to work because of classes and homework.

2. As a result of graduating a year earlier, higher wages will be earned a year earlier as well.

b. Sunk costs for this decision include:

1. Amounts paid for college tuition and books during the past two years.

2. Amounts committed for college tuition and books for the remaining two years.

c. A qualitative consideration would include having different activities and priorities than your friends who are students, graduating later than students who started college the same time you did, and retaining information over the year off from school.

*Objectives*: 2, 3

169. A restaurant is deciding whether it wants to update its image or not. It currently has a cozy appeal with an outdated décor that is still in good condition, menus and carpet that need to be replaced anyway, and loyal customers.

Identify for the restaurant management

a. those costs that are relevant to this decision,

b. those costs that are not differential,

c. and qualitative considerations.

Answer:

For the decision of whether to update the restaurant’s image:

a. Relevant costs include a one-time cost of the renovation for the updated image, and a change in future sales which includes an increase in sales due to the updated image, decrease in sales due to loss of that cozy appeal, and loss of sales due to being closed or having a limited serving area during renovation.

b. Costs that are not differential include replacing the menus and the carpet since they need to be replaced whether the image is updated or not.

c. Qualitative considerations include whether the restaurant will lose that cozy appeal it currently has, if the restaurant needs to be closed for renovations it may result in loss of customers, and new customers may not be the type of customer they want to attract.

*Objectives*: 2, 3

170. Are relevant revenues and relevant costs the only information needed by managers to select among alternatives? Explain using examples.

Answer:

No, relevant revenues and costs provide a financial analysis but do not take into consideration qualitative implications. In a make-or-buy decision, examples of qualitative issues include the supplier’s ability to meet expected quality and delivery standards, and the likelihood that suppliers increase prices of the components in the future.

171. Under what conditions might a manufacturing firm sell a product for less than its long-term price? Why?

Answer:

The price for a short-term order may be less than the price offered to a long-term customer. If a firm has excess capacity that is sitting idle, it is more profitable for the firm to accept a special order for a price below the long-run price than it is to let the capacity sit idle. In addition, the firm may use this strategy for market penetration and to obtain greater market share.

172. For short-term pricing decisions, what costs are relevant when there is available surplus capacity? When there is no available surplus capacity?

Answer:

For both situations the relevant costs are the future incremental costs. However, when there is limited capacity the incremental costs will be greater because they will include the costs of adding capacity or the opportunity costs of alternative manufacturing choices.