Chapter 24(9)
Differential Analysis and Product Pricing

OBJECTIVES

Obj 1	Prepare a differential analysis report for decisions involving leasing or selling equipment, discontinuing an unprofitable segment, manufacturing or purchasing a needed part, replacing usable fixed assets, processing further or selling an intermediate product, or accepting additional business at a special price.
Obj 2	Determine the selling price of a product, using the total cost, product cost, variable cost, and target cost concepts.
Obj 3	Calculate the relative profitability of products in bottleneck production environments.

TRUE/FALSE

1. Differential revenue is the amount of income that would result from the best available alternative proposed use of cash.

ANS: F DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

2. Differential revenue is the amount of increase or decrease in revenue expected from a particular course of action as compared with an alternative.

ANS: T DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

3. If the total unit cost of manufacturing Product Y is currently $36 and the total unit cost after modifying the style is estimated to be $48, the differential cost for this situation is $48.

ANS: F DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

4. If the total unit cost of manufacturing Product Y is currently $36 and the total unit cost after modifying the style is estimated to be $48, the differential cost for this situation is $12.

ANS: T DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

Hill Co. can further process Product O to produce Product P. Product O is currently selling for $60 per pound and costs $42 per pound to produce. Product P would sell for $82 per pound and would require an additional cost of $13 per pound to produce.

5. The differential revenue of producing Product P is $82 per pound.

ANS: F DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

6. The differential revenue of producing Product P is $22 per pound.

ANS: T DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

7. The differential cost of producing Product P is $13 per pound.
ANS: T DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

8. The differential cost of producing Product P is $55 per pound.
ANS: F DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

9. Opportunity cost is the amount of increase or decrease in cost that would result from the best available alternative to the proposed use of cash or its equivalent.
ANS: F DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

10. Differential analysis can aid management in making decisions on a variety of alternatives, including whether to discontinue an unprofitable segment and whether to replace usable plant assets.
ANS: T DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

11. A cost that will not be affected by later decisions is termed a sunk cost.
ANS: T DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

12. A cost that will not be affected by later decisions is termed an opportunity cost.
ANS: F DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

13. The amount of income that would result from an alternative use of cash is called opportunity cost.
ANS: T DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

14. Since the costs of producing an intermediate product do not change regardless of whether the intermediate product is sold or processed further, these costs are not considered in deciding whether to further process a product.
ANS: T DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

15. The costs of initially producing an intermediate product should be considered in deciding whether to further process a product, even though the costs will not change, regardless of the decision.
ANS: F DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

16. In deciding whether to accept business at a special price, the short-run price should be set high enough to cover all costs and expenses, plus provide a reasonable amount for profit.
ANS: F DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

17. In deciding whether to accept business at a special price, the short-run price should be set high enough to cover all variable costs and expenses.
ANS: T DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

18. Eliminating a product or segment may have the long-term effect of reducing fixed costs.
ANS: T DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

19. Make or buy options often arise when a manufacturer has excess productive capacity in the form of unused equipment, space, and labor.
ANS: T DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

20. In addition to the differential costs in an equipment replacement decision, the remaining useful life of the old equipment and the estimated life of the new equipment are important considerations.
ANS: T DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

21. Manufacturers must conform to the Robinson-Patman Act which prohibits price discrimination within the United States unless differences in prices can be justified by different costs of serving different customers.
ANS: T DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

22. When a company is showing a net loss, it is always best to discontinue the segment in order not to continue with losses.
ANS: F DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

23. Discontinuing a segment or product may not be the best choice when the segment is contributing to fixed expenses.
ANS: T DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

24. Make or buy decisions should be made only with related parties.
ANS: F DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

25. Depending on the capacity of the plant, a company may best be served by further processing some of the product and leaving the rest as is, with no further processing.
ANS: T DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

26. A practical approach which is frequently used by managers when setting normal long-run prices is the cost-plus approach.
ANS: T DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

27. The total cost concept includes all manufacturing costs plus selling and administrative expenses in the cost amount to which the markup is added to determine product price.
ANS: T DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

28. The product cost concept includes all manufacturing costs plus selling and administrative expenses in the cost amount to which the markup is added to determine product price.
ANS: F DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

29. The product cost concept includes all manufacturing costs in the cost amount to which the markup is added to determine product price.
ANS: T DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

30. In using the total cost concept of applying the cost-plus approach to product pricing, selling expenses, administrative expenses, and profit are covered in the markup.
ANS: F DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

31. In using the product cost concept of applying the cost-plus approach to product pricing, selling expenses, administrative expenses, and profit are covered in the markup.
ANS: T DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

32. In using the variable cost concept of applying the cost-plus approach to product pricing, fixed manufacturing costs and fixed selling and administrative expenses must be covered by the markup.
ANS: T DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

33. In using the variable cost concept of applying the cost-plus approach to product pricing, fixed manufacturing costs and both fixed and variable selling and administrative expenses must be covered by the markup.
ANS: F DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

34. When standard costs are used in applying the cost-plus approach to product pricing, the standards should be based upon normal levels of performance.
ANS: T DIF: Difficult OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

35. When standard costs are used in applying the cost-plus approach to product pricing, the standards should be based upon ideal levels of performance.
ANS: F DIF: Difficult OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

36. A bottleneck begins when demand for the company's product exceeds the ability to produce the product.
ANS: T DIF: Easy OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis

37. A bottleneck happens when an employee is too slow to keep with current production.
ANS: F DIF: Easy OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis

38. When a bottleneck occurs between two products, the company must determine the contribution margin for each product and manufacture the product that has the highest contribution margin per bottleneck hour.
ANS: T DIF: Moderate OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis

39. The theory of constraints is a manufacturing strategy that focuses on reducing the influence of bottlenecks on a process.
ANS: T DIF: Moderate OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis

40. The lowest contribution margin per scarce resource is the most profitable.
ANS: F DIF: Moderate OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis

MULTIPLE CHOICE

1. The amount of increase or decrease in revenue that is expected from a particular course of action as compared with an alternative is termed:
   a. manufacturing margin
   b. contribution margin
   c. differential cost
   d. differential revenue
ANS: D DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

2. The amount of increase or decrease in cost that is expected from a particular course of action as compared with an alternative is termed:
   a. period cost
   b. product cost
   c. differential cost
   d. discretionary cost
ANS: C DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

3. A cost that will not be affected by later decisions is termed a(n):
   a. historical cost
   b. differential cost
   c. sunk cost
   d. replacement cost
ANS: C DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

4. The condensed income statement for a business for the past year is presented as follows:

	Product			
	F	G	H	Total
Sales	$300,000	$220,000	$340,000	$860,000
Less variable costs	180,000	190,000	220,000	590,000
Contribution margin	$120,000	$ 30,000	$120,000	$270,000
Less fixed costs	50,000	50,000	40,000	140,000
Income (loss) from oper.	$ 70,000	$ (20,000)	$ 80,000	$130,000

Management is considering the discontinuance of the manufacture and sale of Product G at the beginning of the current year. The discontinuance would have no effect on the total fixed costs and expenses or on the sales of Products F and H. What is the amount of change in net income for the current year that will result from the discontinuance of Product G?

a. $20,000 increase
b. $30,000 increase
c. $20,000 decrease
d. $30,000 decrease

ANS: D DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

5. The condensed income statement for a business for the past year is as follows:

	Product	
	T	U
Sales	$600,000	$320,000
Less variable costs	540,000	220,000
Contribution margin	$ 60,000	$100,000
Less fixed costs	145,000	40,000
Income (loss) from operations	$ (85,000)	$ 60,000

Management is considering the discontinuance of the manufacture and sale of Product T at the beginning of the current year. The discontinuance would have no effect on the total fixed costs and expenses or on the sales of Product U. What is the amount of change in net income for the current year that will result from the discontinuance of Product T?

a. $60,000 increase
b. $85,000 increase
c. $85,000 decrease
d. $60,000 decrease

ANS: D DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

6. A business is operating at 90% of capacity and is currently purchasing a part used in its manufacturing operations for $15 per unit. The unit cost for the business to make the part is $20, including fixed costs, and $12, not including fixed costs. If 30,000 units of the part are normally purchased during the year but could be manufactured using unused capacity, what would be the amount of differential cost increase or decrease from making the part rather than purchasing it?
   a. $150,000 cost increase
   b. $ 90,000 cost decrease
   c. $150,000 cost increase
   d. $ 90,000 cost increase

ANS: B DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

7. A business is operating at 70% of capacity and is currently purchasing a part used in its manufacturing operations for $24 per unit. The unit cost for the business to make the part is $36, including fixed costs, and $28, not including fixed costs. If 15,000 units of the part are normally purchased during the year but could be manufactured using unused capacity, what would be the amount of differential cost increase or decrease from making the part rather than purchasing it?
   a. $60,000 cost decrease
   b. $180,000 cost increase
   c. $60,000 cost increase
   d. $180,000 cost decrease

ANS: C DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

8. The amount of income that would result from an alternative use of cash is called:
   a. differential income
   b. sunk cost
   c. differential revenue
   d. opportunity cost

ANS: D DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

9. Jones Co. can further process Product B to produce Product C. Product B is currently selling for $30 per pound and costs $28 per pound to produce. Product C would sell for $60 per pound and would require an additional cost of $24 per pound to produce. What is the differential cost of producing Product C?
   a. $30 per pound
   b. $24 per pound
   c. $28 per pound
   d. $60 per pound

ANS: B DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

Neter Co. can further process Product J to produce Product D. Product J is currently selling for $21 per pound and costs $15.75 per pound to produce. Product D would sell for $35 per pound and would require an additional cost of $8.75 per pound to produce.

10. What is the differential cost of producing Product D?
    a. $7 per pound
    b. $8.75 per pound
    c. $15 per pound
    d. $5.25 per pound

ANS: B DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

11. What is the differential revenue of producing Product D?
    a. $7 per pound
    b. $8.75 per pound
    c. $14 per pound
    d. $5.25 per pound

ANS: C DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

12. Jones Co. can further process Product B to produce Product C. Product B is currently selling for $60 per pound and costs $42 per pound to produce. Product C would sell for $82 per pound and would require an additional cost of $13 per pound to produce. What is the differential revenue of producing and selling Product C?
    a. $22 per pound
    b. $42 per pound
    c. $45 per pound
    d. $18 per pound

ANS: A DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

13. Wilson Company is considering replacing equipment which originally cost $500,000 and which has $460,000 accumulated depreciation to date. A new machine will cost $790,000. What is the sunk cost in this situation?
    a. $330,000
    b. $500,000
    c. $40,000
    d. $290,000

ANS: C DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

14. Mathews Company is considering replacing equipment which originally cost $500,000 and which has $460,000 accumulated depreciation to date. A new machine will cost $790,000 and the old equipment can be sold for $8,000. What is the sunk cost in this situation?
    a. $53,000
    b. $40,000
    c. $37,000
    d. $290,000

ANS: B DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

15. A business is considering a cash outlay of $200,000 for the purchase of land, which it could lease for $35,000 per year. If alternative investments are available which yield an 18% return, the opportunity cost of the purchase of the land is:
    a. $35,000
    b. $36,000
    c. $ 1,000
    d. $37,000

ANS: B DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

16. A business is considering a cash outlay of $250,000 for the purchase of land, which it could lease for $36,000 per year. If alternative investments are available which yield an 18% return, the opportunity cost of the purchase of the land is:
    a. $45,000
    b. $36,000
    c. $ 9,000
    d. $54,000

ANS: A DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

17. A business is considering a cash outlay of $500,000 for the purchase of land, which it could lease for $40,000 per year. If alternative investments are available which yield a 21% return, the opportunity cost of the purchase of the land is:
    a. $105,000
    b. $ 40,000
    c. $ 65,000
    d. $ 8,400

ANS: A DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

18. A business received an offer from an exporter for 20,000 units of product at $15 per unit. The acceptance of the offer will not affect normal production or domestic sales prices. The following data are available:

Domestic unit sales price	$21
Unit manufacturing costs:	
Variable	12
Fixed	5

    What is the differential revenue from the acceptance of the offer?
    a. $300,000
    b. $420,000
    c. $120,000
    d. $240,000

ANS: A DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

A business received an offer from an exporter for 10,000 units of product at $16 per unit. The acceptance of the offer will not affect normal production or domestic sales prices. The following data are available:

Domestic unit sales price	$20
Unit manufacturing costs:	
Variable	13
Fixed	1

19. What is the differential revenue from the acceptance of the offer?
    a. $200,000
    b. $160,000
    c. $130,000
    d. $140,000

ANS: B DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

20. What is the differential cost from the acceptance of the offer?
    a. $200,000
    b. $160,000
    c. $140,000
    d. $130,000

ANS: D DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

21. What is the amount of gain or loss from acceptance of the offer?
    a. $30,000 gain
    b. $40,000 loss
    c. $30,000 loss
    d. $20,000 loss

ANS: A DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

A business received an offer from an exporter for 20,000 units of product at $15 per unit. The acceptance of the offer will not affect normal production or domestic sales prices. The following data are available:

Domestic unit sales price	$21
Unit manufacturing costs:	
Variable	12
Fixed	5

22. What is the differential cost from the acceptance of the offer?
    a. $120,000
    b. $240,000
    c. $300,000
    d. $420,000

ANS: B DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

23. What is the amount of the gain or loss from acceptance of the offer?
    a. $35,000 loss
    b. $40,000 gain
    c. $60,000 gain
    d. $50,000 gain

ANS: C DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

24. Relevant revenues and costs focus on:
    a. activities that occurred in the past
    b. monies already earned and/or spent
    c. last year's net income
    d. differences between the alternatives being considered

ANS: D DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

25. Assume that Darrow Co. is considering disposing of equipment that cost $50,000 and has $40,000 of accumulated depreciation to date. Darrow Co. can sell the equipment through a broker for $25,000 less 5% commission. Alternatively, Minton Co. has offered to lease the equipment for five years for a total of $48,750. Darrow will incur repair, insurance, and property tax expenses estimated at $10,000. At lease-end, the equipment is expected to have no residual value. The net differential income from the lease alternative is:
    a. $15,000
    b. $ 5,000
    c. $25,000
    d. $12,500

ANS: A DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

26. Frank Co. is currently operating at 80% of capacity and is currently purchasing a part used in its manufacturing operations for $5 a unit. The unit cost for Frank Co. to make the part is $6, which includes $.40 of fixed costs. If 4,000 units of the part are normally purchased each year but could be manufactured using unused capacity, what would be the amount of differential cost increase or decrease for making the part rather than purchasing it?
    a. $12,000 cost decrease
    b. $20,000 cost increase
    c. $20,000 cost decrease
    d. $2,400 cost increase

ANS: D DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

27. Franklin and Johnson, CPAs, currently work a five-day week. They estimate that net income for the firm would increase by $45,000 annually if they worked an additional day each month. The cost associated with the decision to continue the practice of a five-day work week is an example of:
    a. differential revenue
    b. sunk cost
    c. differential income
    d. opportunity cost

ANS: D DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

28. Benson Co. is considering disposing of a machine with a book value of $12,500 and estimated remaining life of five years. The old machine can be sold for $1,500. A new high-speed machine can be purchased at a cost of $25,000. It will have a useful life of five years and no residual value. It is estimated that variable manufacturing costs will be reduced from $26,000 to $23,500 if the new machine is purchased. The total net differential increase or decrease in cost for the new equipment for the entire five years is:
    a. decrease of $11,000
    b. decrease of $15,000
    c. increase of $11,000
    d. increase of $15,000

ANS: C DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

29. Sorrentino Inc. is considering disposing of a machine with a book value of $22,500 and an estimated remaining life of three years. The old machine can be sold for $6,250. A new machine with a purchase price of $68,750 is being considered as a replacement. It will have a useful life of three years and no residual value. It is estimated that variable manufacturing costs will be reduced from $43,750 to $20,000 if the new machine is purchased. The net differential increase or decrease in cost for the entire three years for the new equipment is:
    a. $8,750 increase
    b. $31,250 decrease
    c. $8,750 decrease
    d. $2,925 decrease

ANS: C DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

Dary Co. Produces a single product. Its normal selling price is $28 per unit. The variable costs are $18 per unit. Fixed costs are $20,000 for a normal production run of 5,000 units per month. Dary received a request for a special order that would not interfere with normal sales. The order was for 1,500 units and a special price of $17.50 per unit. Dary Co. has the capacity to handle the special order and, for this order, a variable selling cost of $2 per unit would be eliminated.

30. If the order is accepted, what would be the impact on net income?
    a. decrease of $750
    b. decrease of $6,750
    c. increase of $2,250
    d. increase of $1,500

ANS: C DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

31. Should the special order be accepted?
    a. Cannot determine from the data given
    b. Yes
    c. No
    d. There would be no difference in accepting or rejecting the special order

ANS: B DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

32. Java, Inc has bought a new server and is having to decide what to do with the old one. The cost of the old server was originally $60,000 and has been depreciated $45,000. The company has received two offers that it must consider. One offer was made to purchase the equipment outright for $18,500 less a 5% sales commission. The other offer was to lease the equipment for $7,000 for the next five years but the company will be required to provide maintenance and insurance totaling $3,000 per year. What offer should Java, Inc. accept?
    a. $2,425 in favor of leasing
    b. Reject both offers
    c. $11,500 in favor of selling
    d. $16,500 in favor of leasing

ANS: A

Differential Revenue:

Revenue from lease ($7,000 * 5 years)		$ 35,000
Revenue from sale		18,500
Differential revenue from lease		$ 16,500

Differential Costs

Maintenance and Insurance ($3000 * 5)	$15,000	
Commission Expense on Sale ($18,500* 5%)	925	$ 14,075
Net differential income from the lease alternative		$ 2,425

DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

33. Security Fire Alarm is currently buying 50,000 motherboard from MotherBoard's Inc at a price of $65 per board. It was suggested at the last manager's meeting that the company should consider making its own boards. The costs to make the part are as follows: Direct Materials $32 per unit, Direct labor $10 per unit, Variable Factory Overhead $16.00, Fixed Costs for the plant would increase by $75,000. As the financial advisor, what would you recommend?
    a. Buy - $75,000 more in profits
    b. Make - $275,000 increase in profits
    c. Buy - $275,000 more in profits
    d. Make - $350,000 increase in profits

ANS: B DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

34. Carnival Corp. is considering selling its old popcorn machine and replacing it with a newer one. The old machine originally cost $5,000 and has been fully depreciated. Annual costs are $4,000. A high school is willing to buy it for $2,000. New equipment would cost $18,000 and annual operating costs would be $1,500. Both machines have an estimated useful life of 5 years.
    a. Stay with the old equipment $3,500 less in net costs
    b. Purchase the new equipment $3,500 cost savings
    c. Purchase the new equipment - deduction in costs $14,500
    d. Stay with the old equipment - cost savings of $2,000

ANS: A

Proposal to Replace Equipment
October 30, 2008

Annual variable costs - present equipment	$4,000	
Annual variable costs - new equipment	1,500	
Annual differential decrease in cost	$2,500	
Number of years applicable	5	
Total differential decrease in cost	$12,500	
Proceeds from sales of present equipment	2,000	$14,500
Cost of New Equipment		18,000
Annual net differential increase in cost - new equipment		($ 3,500)

DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

35. Sandy Art Company sells unfinished wooden decorations at a price of $15.00. The current profit margin is $5.00 per decoration. The company is considering taking individual orders and customizing them for sale. To finish the decoration the company would have to pay additional labor of $3.00, additional materials costing an average of $4.00 per unit and fixed costs would increase by $1,500. If the company estimates that it can sell 600 units for $25 each month, would they make additional profits or losses?
    a. $300 profit
    b. $300 loss
    c. $800 profit
    d. $800 loss

ANS: A

Proposal to Process Decorations Further
September 3, 2009

Differential revenue:		
Revenue for finished decorations (600 units * $25.)		$15,000
Revenue for unfinished decorations (600 units * $15)		9,000
Differential Revenue		$ 6,000
Differential cost:		
Direct Materials (600 units * $3.00)	$1,800	
Direct Labor (600 * $4.00)	2,400	
Additional Fixed Costs	1,500	$ 5,700
Differential income from further processing		$ 300

DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

36. Safe Security Company manufacturers home alarms. Currently it is manufacturing one of its components at a variable cost of $45 and fixed costs of $15 per unit. An outside provider of this component has offered to sell Safe Security the component for $50. Determine the best plan and calculate the savings.
    a. $5 savings per unit - Manufacture
    b. $5 savings per unit - Purchase
    c. $10 savings per unit - Manufacture
    d. $15 savings per unit - Purchase

ANS: A DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

37. Discontinuing a product or segment is a huge decision that must be carefully analyzed. Which of the following would be a valid reason not to discontinue an operation?
    a. when the losses are minimal
    b. when the variable costs are less than revenues
    c. when the variable costs are more than revenues
    d. when fixed costs are more than revenues

ANS: B DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

38. Which of the following would be considered a sunk cost?
    a. Purchase of new equipment
    b. Equipment rental for the production area
    c. Net book value of obsolete equipment that has no market value
    d. Depreciation expense

ANS: C DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

39. All of the following should be considered in a make or buy decision except
    a. cost savings
    b. quality issues with the supplier
    c. future growth in the plant and other production opportunities
    d. the supplier will make a profit that would no longer belong to the business

ANS: D DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

40. A business may decide to accept additional business at a special price for all of the following reasons except
    a. if additional sales will not conflict with regular sales.
    b. if additional sales will increase differential income.
    c. if there is an increase to sales only if fixed expenses are not increased.
    d. if there is an increase to sales even if fixed expenses are also increased.

ANS: D DIF: Difficult OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

41. A practical approach which is frequently used by managers when setting normal long-run prices is the:
    a. cost-plus approach
    b. economic theory approach
    c. price graph approach
    d. market price approach

ANS: A DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

42. Which of the following is NOT a cost concept commonly used in applying the cost-plus approach to product pricing?
    a. Total cost concept
    b. Product cost concept
    c. Variable cost concept
    d. Fixed cost concept

ANS: D DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

43. In using the total cost concept of applying the cost-plus approach to product pricing, what is included in the markup?
    a. Total selling and administrative expenses plus desired profit
    b. Total fixed manufacturing costs, total fixed selling and administrative expenses, and desired profit
    c. Total costs plus desired profit
    d. Desired profit

ANS: D DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

44. In using the product cost concept of applying the cost-plus approach to product pricing, what is included in the markup?
    a. Desired profit
    b. Total fixed manufacturing costs, total fixed selling and administrative expenses, and desired profit
    c. Total costs plus desired profit
    d. Total selling and administrative expenses plus desired profit

ANS: D DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

45. In using the variable cost concept of applying the cost-plus approach to product pricing, what is included in the markup?
    a. Total costs plus desired profit
    b. Desired profit
    c. Total selling and administrative expenses plus desired profit
    d. Total fixed manufacturing costs, total fixed selling and administrative expenses, and desired profit

ANS: D DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

46. What cost concept used in applying the cost-plus approach to product pricing covers selling expenses, administrative expenses, and desired profit in the "markup"?
    a. Total cost concept
    b. Product cost concept
    c. Variable cost concept
    d. Sunk cost concept

ANS: B DIF: Difficult OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

47. What cost concept used in applying the cost-plus approach to product pricing includes only desired profit in the "markup"?
    a. Product cost concept
    b. Variable cost concept
    c. Sunk cost concept
    d. Total cost concept

ANS: D DIF: Difficult OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

48. What cost concept used in applying the cost-plus approach to product pricing includes only total manufacturing costs in the "cost" amount to which the markup is added?
    a. Variable cost concept
    b. Total cost concept
    c. Product cost concept
    d. Opportunity cost concept

ANS: C DIF: Difficult OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

49. Managers who often make special pricing decisions are more likely to use which of the following cost concepts in their work?
    a. Total cost
    b. Product cost
    c. Variable cost
    d. Fixed cost

ANS: C DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

50. Defense contractors would be more likely to use which of the following cost concepts in pricing their product?
    a. Variable cost
    b. Product cost
    c. Total cost
    d. Fixed cost

ANS: C DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

51. In contrast to the total product and variable cost concepts used in setting seller's prices, the target cost approach assumes that:
    a. a markup is added to total cost
    b. selling price is set by the marketplace
    c. a markup is added to variable cost
    d. a markup is added to product cost

ANS: B DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

McClelland Corporation uses the total cost concept of product pricing. Below is cost information for the production and sale of 60,000 units of its sole product. McClelland desires a profit equal to a 21% rate of return on invested assets of $600,000.

Fixed factory overhead cost	$37,500
Fixed selling and administrative costs	7,500
Variable direct materials cost per unit	4.50
Variable direct labor cost per unit	1.88
Variable factory overhead cost per unit	1.13
Variable selling and administrative cost per unit	4.50

52. The dollar amount of desired profit from the production and sale of the company's product is:
    a. $126,000
    b. $67,200
    c. $73,500
    d. $96,000

ANS: A DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

53. The cost per unit for the production and sale of the company's product is:
    a. $12
    b. $12.76
    c. $15
    d. $13.50

ANS: B DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

54. The markup percentage for the company's product is:
    a. 21.0%
    b. 16.5%
    c. 15.7%
    d. 24.0%

ANS: B DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic |IMA-Decision Analysis

55. The unit selling price for the company's product is:
    a. $15.00
    b. $13.82
    c. $14.86
    d. $14.76

ANS: C DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

Mendoza Corporation uses the product cost concept of product pricing. Below is cost information for the production and sale of 45,000 units of its sole product. Mendoza desires a profit equal to a 10.8% rate of return on invested assets of $900,000.

Fixed factory overhead cost	$72,000
Fixed selling and administrative costs	45,000
Variable direct materials cost per unit	4.50
Variable direct labor cost per unit	7.65
Variable factory overhead cost per unit	2.25
Variable selling and administrative cost per unit	.90

56. The dollar amount of desired profit from the production and sale of the company's product is:
    a. $105,840
    b. $225,000
    c. $ 97,200
    d. $220,500

ANS: C DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

57. The cost per unit for the production of the company's product is:
    a. $14.40
    b. $16.00
    c. $15.30
    d. $15.75

ANS: B DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

58. The markup percentage for the company's product is:
    a. 25.38%
    b. 10.98%
    c. 26.1%
    d. 18%

ANS: A DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

59. The unit selling price for the company's product is:
    a. $17.73
    b. $15.75
    c. $22.05
    d. $20.06

ANS: D DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

Elfrink Corporation uses the variable cost concept of product pricing. Below is cost information for the production and sale of 35,000 units of its sole product. Elfrink desires a profit equal to a 11.2% rate of return on invested assets of $350,000.

Fixed factory overhead cost	$105,000
Fixed selling and administrative costs	35,000
Variable direct materials cost per unit	4.34
Variable direct labor cost per unit	5.18
Variable factory overhead cost per unit	.98
Variable selling and administrative cost per unit	.70

60. The dollar amount of desired profit from the production and sale of the company's product is:
    a. $89,600
    b. $39,200
    c. $70,000
    d. $84,000

ANS: B DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

61. The variable cost per unit for the production and sale of the company's product is:
    a. $14.00
    b. $12.60
    c. $ 9.80
    d. $11.20

ANS: D DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

62. The markup percentage for the sale of the company's product is:
    a. 14%
    b. 5.6%
    c. 45.71%
    d. 11.2%

ANS: C DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

63. The unit selling price for the company's product is:
    a. $16.32
    b. $13.44
    c. $12.10
    d. $13.72

ANS: A DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

64. What pricing method may be used if there are several providers in the same market and there is sufficient demand for your product?
    a. Demand-based method
    b. Total cost method
    c. Cost-plus method
    d. Competition-based method

ANS: D DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

65. What pricing method is used if all costs are considered and a fair mark-up is added to determine the selling price?
    a. Total cost method
    b. Demand-based method
    c. Variable cost method
    d. Mark-up method

ANS: A DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

66. Using the variable cost concept determine the selling price for 30,000 units using the following data: Variable cost per unit $13.00, $120,000 desired profit, and total fixed costs $80,000.
    a. $20.00
    b. $21.67
    c. $17.00
    d. $19.67

ANS: D

$$\text{Markup percentage} = \frac{\text{Desired profit + Total fixed costs}}{\text{Total Variable Costs}}$$

$$\text{MP} = \frac{\$120,000 + 80,000}{\$390,000} = 51.3\%$$

Selling price = $13.00 * 51.3%= 6.66
SP = $13 + $6.67 =$19.67

DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

67. Which equation better describes Target Costing?
    a. Selling Price - Desired Profit = Target Costs
    b. Selling Price - Target Costs = Profit
    c. Target Variable Costs + Contribution Margin = Selling Price
    d. Selling Price = Target Variable Costs + Target Fixed Costs + Profit

ANS: A DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

The Koko Company produces their product at a total cost of $43 per unit. Of this amount $8 per unit is selling and administrative costs. The total variable cost is $30 per unit The desired profit is $20 per unit.

68. Determine the mark up percentage on product cost.
    a. 80%
    b. 46%
    c. 70%
    d. 65%

ANS: A DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

69. Determine the mark up percentage on variable cost.
    a. 100%
    b. 110%
    c. 80%
    d. 57%

ANS: C DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

70. Target costing is arrived at by
    a. taking the selling price and subtracting desired profit.
    b. taking the selling price and adding desired profit.
    c. taking the selling price and subtracting the budget standard cost.
    d. taking the budget standard cost and reducing it by 10%.

ANS: A DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

71. Soap Company manufactures Soap X and Soap Y and can sell all it can make of either. Based on the following data, which statement is true?

	X	Y
Sales Price	$32	$40
Variable Cost	22	24
Hours needed to process	5	8

    a. X is more profitable than Y
    b. Y is more profitable than X
    c. Neither X nor Y have a positive contribution margin.
    d. X and Y are equally profitable.

ANS: B DIF: Moderate OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis

Niva Co. manufactures three products: Bales; Tales; and Wales. The selling prices are: 55; 78; and 32, respectively. The variable costs for each product are: 20; 50; and 15, respectively. Each product must go through the same processing in a machine that is limited to 2,000 hours per month. Bales take 7 hours to process, Tales take 4 hours, and Wales take 1 hour.

72. Which product has the highest contribution margin per machine hour?
    a. Bales
    b. Tales
    c. Wales
    d. Bales and Tales have the same

ANS: C DIF: Moderate OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis

73. What is the contribution margin per machine hour for Bales?
    a. $7
    b. $5
    c. $35
    d. $28

ANS: B DIF: Moderate OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis

74. What is the contribution margin per machine hour for Tales?
    a. $7
    b. $5
    c. $28
    d. $35

ANS: A DIF: Moderate OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis

75. What is the contribution per machine hour for Wales?
    a. $35
    b. $28
    c. $17
    d. $8.50

ANS: C DIF: Moderate OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis

76. Assuming that Niva Co. can sell all of the products they can make, what is the maximum contribution margin they can earn per month?
    a. $64,000
    b. $70,000
    c. $56,000
    d. $34,000

ANS: D DIF: Moderate OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis

77. Assuming that Niva produced enough product with the highest contribution margin per unit to use 1,000 hours of machine time. Product demand does not warrant any more production of that product. What is the maximum additional contribution margin that can be realized by utilizing the remaining 1,000 hours on the product with the second highest contribution margin per hour?
    a. $5,000
    b. $7,000
    c. $4,000
    d. $28,000

ANS: B DIF: Moderate OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis

EXERCISE/OTHER

1. The Delicious Cake Factory owns a building for its operations. Delicious uses only half of the building and is considering two options that have been presented to them. The Candy Store would like to purchase the half of the building that is not being used for $550,000. A 7% commission would have to be paid at the time of purchase. Ice Cream Delight would like to lease the half of the building for the next 5 years at $100,000 each year. Delicious would have to continue paying $9,000 of property taxes each year and $1,000 of yearly insurance on the property, according to the proposed lease agreement.

   Determine the differentia income or loss from the lease alternative.

ANS:

Differential revenue from alternatives:		
Revenue from lease	$500,000	
Revenue from sale	550,000	
Differential loss from lease		(50,000)
Differential cost of alternatives:		
Property tax and insurance	$50,000	
Commission expense	38,500	
Differential cost of lease		(11,500)
Net differential loss from the lease alternative		($61,500)

DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis TOP: Example Exercise 24(9)-1

2. Koko Company Division B recorded sales of $350,000, variable cost of goods sold of $315,000, variable selling expenses of $13,000, and fixed costs of $60,000, creating a loss from operations of $38,000. Determine (a) the differential income or loss from the sales of Division B and (b) should this division be discontinued?

ANS:

(a)

Differential revenue		$350,000
Differential costs:		
Variable cost of goods sold	$315,000	
Variable selling expenses	13,000	328,000
Annual differential income Division B		22,000

(b) Division B should not be discontinued.

DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis TOP: Example Exercise 24(9)-2

3. Safe Security Company manufacturers home alarms. Currently it is manufacturing one of its components at a variable cost of $45 and fixed costs of $15 per unit. An outside provider of this component has offered to sell them the component for $30. Provide a differential analysis of the outside purchase proposal.

ANS:

Differential cost to purchase:	
Purchase price of the component	$30
Differential cost to manufacture:	
Variable manufacturing costs	$45
Cost savings from purchasing component	$15

DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis TOP: Example Exercise 24(9)-3

4. An oven with a book value of $67,000 has an estimated 5 year life. A proposal is offered to sell the oven for $8,500 and replace it with a new oven for $115,000. The new machine has a five year life with no residual value. The new machine would reduce annual maintenance costs by $23,000. Provide a differential analysis on the proposal to replace the machine.

ANS:

Annual maintenance cost reduction	$23,000	
Number of years applicable	× 5	
Total differential decrease in cost	$115,000	
Proceeds from sale of equipment	8,500	$123,500
Cost of new equipment		115,000
Net differential decrease in cost from replacing equipment		$8,500

DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis TOP: Example Exercise 24(9)-4

5. An unfinished desk is produced for $36.00 and sold for $65. An additional amount of $6.65 of processing can be added to the desk which will allow the company to sell the desk for $75. Provide a differential analysis for further processing.

ANS:

Differential revenue from further processing:		
Revenue per unfinished desk	$65.00	
Revenue per finished desk	75.00	
Differential revenue		$10.00
Differential cost per desk:		
Additional cost for producing		6.65
Differential income from further processing		$3.35

DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis TOP: Example Exercise 24(9)-5

6. Delicious Cake Factory normally sells their specialty cake for $22. An offer to buy 100 cakes for $18 per cake was made by an organization hosting a national event in the city. The variable cost per cake is $12. A special decoration per cake will add another $1 to the cost. Determine the differential income or loss per cake from selling the cakes.

ANS:

Differential revenue:		
Revenue per cake		$18
Differential cost:		
Variable manufacturing costs	$12	
Additional decoration	1	13
Differential income from accepting special order		$5

DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis TOP: Example Exercise 24(9)-6

7. The Koko Company produces their product at a total cost of $50 per unit. Of this amount $14 per unit is selling and administrative costs. The total variable cost is $38 per unit The desired profit is $20 per unit. Determine the mark up percentage on total cost.

ANS:
Mark up percentage: $20 / $50 = 40%

DIF: Easy OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis TOP: Example Exercise 24(9)-7

8. The Koko Company produces their product at a total cost of $50 per unit. Of this amount $14 per unit is selling and administrative costs. The total variable cost is $38 per unit The desired profit is $20 per unit. Determine the mark up percentage on product cost.

ANS:
Mark Up Percentage on Product cost = ($20 + 14) / $36 = 94 %

DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis TOP: Example Exercise 24(9)-8

9. The Koko Company produces their product at a total cost of $50 per unit. Of this amount $14 per unit is selling and administrative costs. The total variable cost is $38 per unit The desired profit is $20 per unit. Determine the mark up percentage on variable cost.

ANS:
Markup percentage on variable cost = ($20 + $12) / $38 = 84%

DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis TOP: Example Exercise 24(9)-9

10. Koko Company produces two products. Product A has a contribution margin of $20 and requires 4 machine hours. Product B has a contribution margin of $18 and requires 3 machine hours. Determine the most profitable product assuming the machine hours are the constraint.

ANS:

	Product A	Product B
Contribution margin per unit	$20	$18
Machine hours	4	3
Contribution margin per bottleneck hour	$5	$6
Product B is the most profitable.		

DIF: Moderate OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis TOP: Example Exercise 24(9)-10

PROBLEM

1. Bell Company is considering the disposal of equipment that is no longer needed for operations. The equipment originally cost $600,000 and accumulated depreciation to date totals $460,000. An offer has been received to lease the machine for its remaining useful life for a total of $290,000, after which the equipment will have no salvage value. The repair, insurance, and property tax expenses during the period of the lease are estimated at $75,800. Alternatively, the equipment can be sold through a broker for $230,000 less a 10% commission.

   Prepare a differential analysis report, dated June 15 of the current year, on whether the equipment should be leased or sold.

ANS:

Bell Company
Proposal to Lease or Sell Equipment
June 15, 20--

Net Revenue from leasing:		
Revenue from lease	$290,000	
Costs associated with the lease	75,800	
Net revenue from lease		$214,200
Net Revenue from selling:		
Sales price	$230,000	
Commission expense on sale	23,000	
Net from selling		207,000
Net advantage of lease alternative		$ 7,200

DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

2. Product J is one of the many products manufactured and sold by Goodstein Company. An income statement by product line for the past year indicated a net loss for Product J of $12,250. This net loss resulted from sales of $260,000, cost of goods sold of $186,500, and operating expenses of $85,750. It is estimated that 30% of the cost of goods sold represents fixed factory overhead costs and that 40% of the operating expense is fixed. If Product J is retained, the revenue, costs, and expenses are not expected to change significantly from those of the current year. However, because of the net loss, management is considering the elimination of the unprofitable endeavor. Because of the large number of products manufactured, the total fixed costs and expenses are not expected to decline significantly if Product J is discontinued.

   Prepare a differential analysis report, dated February 8 of the current year, on the proposal to discontinue Product J.

ANS:

Goodstein Company
Proposal to Discontinue Product J
February 8, 20--

Differential revenue from annual sales of product:		
Revenue from sales		$260,000
Differential cost of annual sales of product:		
Variable cost of goods sold	$130,550	
Variable operating expenses	51,450	182,000
Annual differential income from sales of Product J		$ 78,000

DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

3. Pnok Company has been purchasing a component, Part Q, for $18.90 a unit. Pnok is currently operating at 70% of capacity and no significant increase in production is anticipated in the near future. The cost of manufacturing a unit of Part Q, determined by absorption costing methods, is estimated as follows:

Direct materials	$11.25
Direct labor	4.50
Variable factory overhead	1.12
Fixed factory overhead	3.15
Total	$20.02

Prepare a differential analysis report, dated March 12 of the current year, on the decision to make or buy Part Q.

ANS:

Pnok Company
Proposal to Manufacture Part Q
March 12, 20--

Purchase price of part		$18.90
Differential cost to manufacture part:		
Direct materials	$11.25	
Direct labor	4.50	
Variable factory overhead	1.12	16.87
Cost savings from manufacturing Part Q		$ 2.03

DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

4. FDE Manufacturing Company has a normal plant capacity of 37,500 units per month. Because of an extra large quantity of inventory on hand, it expects to produce only 30,000 units in May. Monthly fixed costs and expenses are $112,500 ($3 per unit at normal plant capacity) and variable costs and expenses are $8.25 per unit. The present selling price is $13.50 per unit. The company has an opportunity to sell 7,500 additional units at $9.90 per unit to an exporter who plans to market the product under its own brand name in a foreign market. The additional business is therefore not expected to affect the regular selling price or quantity of sales of FDE Manufacturing Company.

Prepare a differential analysis report, dated April 21 of the current year, on the proposal to sell at the special price.

ANS:

Proposal to Sell to Exporter
April 21, 20--

Differential revenue from accepting offer:	
Revenue from sale of 7,500 additional units at $9.90	$74,250
Differential cost of accepting offer:	
Variable costs and expenses of 7,500 additional units at $8.25	61,875
Differential income from accepting offer	$12,375

DIF: Moderate OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

5. Due to Medicare reimbursement cuts, Nurturing Home Care is considering shutting down it's Certified Nursing Assistant Division. Fixed costs will have to be transferred to the Nursing Division if the CNA division is discontinued. Currently, the fixed costs are shared equally. Using the Income Statement below, make a recommendation to the president regarding this decision.

Nurturing Home Care
Condensed Income Statement
For the Year Ended December 31, 2007

	Nursing	CNA's	Total
Revenues	$3,500,000	$900,000	$4,400,000
Variable Costs	2,000,000	800,000	2,800,000
Fixed Costs	400,000	400,000	800,000
Net Income from operations	$1,100,000	($300,000)	$ 800,000

ANS:

Proposal to Discontinue CNA's
December 31, 2007

Differential revenue from annual revenue from CNA's	$900,000
Differential variable costs from CNA's	800,000
Annual differential income from CNA's revenue	$100,000

Keep for now as operating income would decrease by $100,000 if the CNA division were discontinued.

DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

6. Christmas Decorations Unique has been approached by the community college to make special decorations for the faculty and staff. The college is willing to buy 5,000 Christmas ornaments with their own design for $5 a piece. The company normally sells its decorations for $12.00 each. A break down of their costs is as follows:

Direct Materials	$2.00
Direct Labor	.50
Variable Costs	1.00
Fixed Costs	1.75
Total Cost Per Unit	$5.25

Should Christmas Decorations Unique accept the special order made by the college? The company has enough excess capacity to make this order.

ANS:

Proposal to Sell Christmas Decorations to College
November 5, 2008

Differential Revenue from accepting offer (5,000 * $5)	$25,000
Differential variable costs of additional units (5,000 * $3.50)	17,500
Differential income from accepting the offer	$ 7,500

DIF: Easy OBJ: 24(9)-01
NAT: AACSB Analytic | IMA-Decision Analysis

7. The Koko Company produces their product at a total cost of $86 per unit. Of this amount $15 per unit is selling and administrative costs. The total variable cost is $60 per unit The desired profit is $25 per unit. Determine the mark up percentage on (a) total cost, (b) product cost and (c) variable cost concepts.

ANS:
(a) $25 / $86 = 29%

(b) ($25 + $15) / $71 = 56%

(c) ($25 + $26) / $60 = 85%

DIF: Moderate OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

8. Mavis Company uses the total cost concept of applying the cost-plus approach to product pricing. The costs and expenses of producing and selling 38,400 units of Product E are as follows:

Variable costs:	
Direct materials	$ 4.70
Direct labor	2.50
Factory overhead	1.90
Selling and administrative expenses	2.60
Total	$ 11.70
Fixed costs:	
Factory overhead	$80,000
Selling and administrative expenses	14,000

Mavis desires a profit equal to a 14% rate of return on invested assets of $640,000.

(a) Determine the amount of desired profit from the production and sale of Product E.
(b) Determine the total costs and the cost amount per unit for the production and sale of 38,400 units of Product E.
(c) Determine the markup percentage for Product E.
(d) Determine the selling price of Product E.

ANS:

(a) $89,600 ($640,000 × 14%)

(b) Total costs:

Variable ($11.70 × 38,400 units)	$449,280
Fixed ($80,000 + $14,000)	94,000
Total	$543,280
Cost amount per unit: $543,280/38,400 units	$ 14.15

(c) Markup Percentage = Desired Profit / Total Costs

Markup Percentage = $89,600 / $543,280

Markup Percentage = 16.5%

(d)

Cost amount per unit	$14.15
Markup ($14.15 × 16.5%)	2.33
Selling price	$16.48

DIF: Difficult OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

9. Moreland Company uses the product cost concept of applying the cost-plus approach to product pricing. The costs and expenses of producing 25,000 units of Product K are as follows:

Variable costs:	
Direct materials	$2.50
Direct labor	4.25
Factory overhead	1.25
Selling and administrative expenses	.50
Total	$8.50
Fixed costs:	
Factory overhead	$25,000
Selling and administrative expenses	17,000

Moreland desires a profit equal to a 5% rate of return on invested assets of $642,500.

(a) Determine the amount of desired profit from the production and sale of Product K.
(b) Determine the total manufacturing costs and the cost amount per unit for the production and sale of 25,000 units of Product K.
(c) Determine the markup percentage for Product K.
(d) Determine the selling price of Product K.

ANS:

(a) $32,125 ($642,500 × 5%)

(b)

Total manufacturing costs:	
Variable ($8.00 × 25,000 units)	$200,000
Fixed factory overhead	25,000
Total	$225,000
Cost amount per unit: $225,000/25,000 units	$ 9.00

(c)

$$\text{Markup Percentage} = \frac{\text{Total Manufacturing Costs}}{\$225{,}000} = \frac{\$\ 61{,}625}{\$225{,}000} = 27.4\%$$

(d)

Cost amount per unit	$ 9.00
Markup ($9.00 × 27.4%)	2.47
Selling price	$11.47

DIF: Difficult OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

10. Star Company uses the variable cost concept of applying the cost-plus approach to product pricing. The costs and expenses of producing and selling 75,000 units of Product T are as follows:

Variable costs:	
Direct materials	$ 7.00
Direct labor	3.50
Factory overhead	1.50
Selling and administrative expenses	3.00
Total	$ 15.00
Fixed costs:	
Factory overhead	$45,000
Selling and administrative expenses	20,000

Star desires a profit equal to a 18% rate of return on invested assets of $1,440,000.

(a) Determine the amount of desired profit from the production and sale of Product T.
(b) Determine the total variable costs for the production and sale of 75,000 units of Product T.
(c) Determine the markup percentage for Product T.
(d) Determine the unit selling price of Product T.

ANS:

(a) $259,200($1,440,000 × 18%)

(b) Total variable costs: $15.00 × 75,000 units = $1,125,000

(c) $$\text{Markup Percentage} = \frac{\text{Desired Profit + Total Fixed Costs}}{\text{Total Variable Costs}}$$

$$\text{Markup Percentage} = \frac{\$259,200 + \$45,000 + \$20,000}{\$1,125,000}$$

$$\text{Markup Percentage} = \frac{\$324,200}{\$1,125,000}$$

Markup Percentage = 28.8%

(d)	Cost amount per unit	$15.00
	Markup ($15 × 28.8%)	4.32
	Selling price	$19.32

DIF: Difficult OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

11. Carrigan Inc. manufactures Product B, incurring variable costs of $15.00 per unit and fixed costs of $70,000. Carrigan desires a profit equal to a 12% rate of return on assets, $785,000 of assets are devoted to producing Product B, and 100,000 units are expected to be produced and sold.

    (a) Compute the markup percentage, using the total cost concept.
    (b) Compute the selling price of Product B.

ANS:

(a) $$\text{Markup Percentage} = \frac{\text{Desired Profit}}{\text{Total Costs}}$$

$$\text{Markup Percentage} = \frac{\$785{,}000 \times .12}{(\$15 \times 100{,}000) + \$70{,}000}$$

$$\text{Markup Percentage} = \frac{\$94{,}200}{\$1{,}570{,}000}$$

Markup Percentage = 6%

(b)		
	Cost amount per unit	$15.70
	Markup ($15.70 × 6%)	.94
	Selling price of Product B	$16.64

DIF: Difficult OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

12. Linderman Co. produces an automotive product and incurs total manufacturing costs of $2,500,000 in the production of 80,000 units. The company desires to earn a profit equal to a 12% rate of return on assets. Linderman employs $960,000 of assets to manufacture the product. Total selling and administrative expenses are $105,000.

    (a) Calculate the markup percentage, using the product cost concept.
    (b) Compute the price of the automotive product.

ANS:

(a) $$\text{Markup Percentage} = \frac{\text{Desired Profit + Total Selling and Administrative Expenses}}{\text{Total Manufacturing Costs}}$$

$$\text{Markup Percentage} = \frac{\$115{,}200 + \$105{,}000}{\$2{,}500{,}000}$$

$$\text{Markup Percentage} = \frac{\$220{,}200}{\$2{,}500{,}000}$$

Markup Percentage = 8.8%

(b)	Cost amount per unit	$31.25
	Markup ($31.25 × 8.8%)	2.75
	Selling price	$34.00

DIF: Difficult OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

13. Sacks Co. manufactures mobile cellular equipment and develops a price for the product by using a variable cost concept. Sacks incurs variable costs of $1,900,000 in the production of 100,000 units. Fixed costs total $50,000. The company employs $4,725,000 of assets and wishes to earn a profit equal to a 10% rate of return on assets.

    (a) Compute a markup percentage based on variable cost.
    (b) Determine a selling price.

ANS:

(a)

$$\text{Markup Percentage} = \frac{\text{Desired Profit + Total Fixed Costs}}{\text{Total Variable Costs}}$$

$$\text{Markup Percentage} = \frac{\$472{,}500 + \$50{,}000}{\$1{,}900{,}000}$$

$$\text{Markup Percentage} = \frac{\$522{,}500}{\$1{,}900{,}000}$$

Markup Percentage = 27.5%

(b)		
	Cost amount per unit	$19.00
	Markup ($19 × 27.5%)	5.23
	Selling price	$24.23

DIF: Difficult OBJ: 24(9)-02
NAT: AACSB Analytic | IMA-Decision Analysis

14. Snazzle Soft Drinks makes three products: iced tea, soda, and lemonade. The following data are available:

	Iced Tea	Soda	Lemonade
Sales price per unit	$.90	$.60	$.50
Variable cost per unit	.30	.15	.10
Contribution margin per unit	$.60	$.45	$.40

Snazzle is experiencing a bottleneck in one of its processes that affects each product as follows:

	Iced Tea	Soda	Lemonade
Bottleneck process hours per unit	3	3	4

(a) Using a theory of constraints (TOC) approach, rank the products in terms of profitability.
(b) What price for lemonade would equate its profitability to that of soda?

ANS:
(a)

$$\frac{\text{Contribution Margin per Unit}}{\text{Bottleneck Hours per Unit}} = \text{CM per Bottleneck Hour}$$

Rank

(1) Iced Tea: $\frac{\$.60}{3} = \$.20 = \text{CM per Bottleneck Hour}$

(2) Soda: $\frac{\$.45}{3} = \$.15 = \text{CM per Bottleneck Hour}$

(3) Lemonade: $\frac{\$.40}{4} = \$.10 = \text{CM per Bottleneck Hour}$

(b)

$$\text{Contribution margin per bottleneck hour of soda} = \frac{\text{Revised Price of Lemonade (L)} - \text{Variable Cost of Lemonade}}{\text{Bottleneck Hours per Unit of Lemonade}}$$

$$\$.15 = \frac{L - \$.10}{4}$$

$$\$.60 = L - \$.10$$

$$\$.60 + \$.10 = L$$

$$\$.70 = L$$

DIF: Difficult OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis

15. The Delicious Cake Factory sells chocolate cakes, birthday decorated cakes, and specialty cakes. The factory is experiencing a bottleneck and is trying to determine which cake is more profitable. Even though the company may have to limit the orders that it takes, they are concerned about customer service and satisfaction.
    (A) Calculate the contribution margin per hour per cake.
    (B) Determine which cakes the company should try to sell more of first, second, then last.

	Chocolate Cake	**Birthday Cake**	**Specialty Cake**
Sales price	**$25.00**	**$45.00**	**$30.00**
Variable cost per cake	**$5.00**	**$12.00**	**$10.00**
Hours needed to bake, frost, and decorate	**1 hour**	**2.5 hours**	**2 hours**

ANS:
(A) Chocolate $20, Birthday $33, Speciality $20
(B) Chocolate, Birthday, Specialty

	Chocolate Cake	Birthday Cake	Specialty Cake
Sales price	$25.00	$45.00	$30.00
Variable cost per cake	$5.00	$12.00	$10.00
Contribution Margin per cake	$20.00	$33.00	$20.00
Hours needed to bake, frost, and decorate	1 hour	2.5 hours	2 hours
Contribution margin per hour	$20.00	$16.50	$10.00

DIF: Difficult OBJ: 24(9)-03
NAT: AACSB Analytic | IMA-Decision Analysis