MARGINAL ANALYSIS

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Tactical decision making or Relevant costing consists of choosing among alternatives with an immediate or limited end in view. Some tactical decisions tend to be short-run in nature. However, it should be emphasized that short-run decisions often have long-run consequences.

When making a decision, you must choose between at least two options. There are various options to consider in some instances. Other selections, on the other hand, may necessitate a choice between only two options, one of which may be the status quo. Regardless of the number or types of options available, the costs and advantages of each must be weighed during the decision-making process.

Information is essential to arrive at a sound decision. Information is gathered from internal and external sources. Most often, internal sources are historical records that are used to estimated current costs.

Information can take the form of quantitative or qualitative information. Quantitative information is measurable in terms of units or money, while qualitative information cannot be measured but are of equal importance in decision making.

THE DECISION-MAKING PROCESS
The following steps are followed when performing tactical decision making

a. Define the problem
b. Obtain information.
c. Identify alternatives
d. Determine possible consequence of the alternatives
e. Choose the best alternative and implement the decision.
f. Evaluate performance

Analyzing Alternatives

Total Approach analyzes information by preparing complete set of financial reports for each alternative.
Differential Analysis analyzed only information that changes between alternatives.

IDENTIFYING RELEVANT COSTS

The two essential characteristics of Relevant Cost are **1) future cost, and 2) it changes between two alternatives**.

Examples of Relevant Cost.

a. Variable cost
b. Avoidable fixed cost
c. Imputed costs
d. Opportunity costs
e. Savings

Irrelevant Costs

Irrelevant costs are costs that are not included when analyzing investment alternatives.

Discretionary and Committed Costs

Both Discretionary and Committed costs are future costs but will not change between two alternatives. Discretionary Costs is inherent to the operations. In contrast Committed cost is a cost that the company is obligated to incur and cannot get out of it. Most of the time it arises from a contract.

Sunk Cost

Sunk Cost is a historical cost that will no longer change between two alternatives.

Income Tax

Income taxes are typically irrelevant in decision making.

Illustration

1. Laurel Corporation has its own cafeteria with the following annual costs:

Food	$100,000
Labor	75,000
Overhead	110,000
TOTAL	$285,000

The overhead is 40% fixed. Of the fixed overhead, $25,000 is the salary of the cafeteria supervisor. The remainder of the fixed overhead has been allocated from total company overhead. Assuming the cafeteria supervisor will remain and that Laurel will continue to pay his/her salary. Identify the relevant costs.

DECISION MAKING GUIDE

Quantitative approach- these deals with analyzing factors that are measurable in terms of dollar impact on profits. The basic rule is choosing the alternative that will increase profits.

Qualitative approach- these deals with analyzing non-financial factors that will indirectly affect profitability.

Indifference Point Example

J Motors, Inc. employs 45 sales personnel to market its line of luxury automobiles. The average car sells for $23,000, and a 6% commission is paid to the salesperson. JJ Motors is considering a change to a commission arrangement that would pay each salesperson a salary of $2,000 per month plus a commission of 2% of the sales made by that salesperson. The amount of total monthly car sales at which JJ Motors would be indifferent as to which plan to select is?

MAKE OR BUY DECISION

A make-or-buy decision is a decision of whether to make or buy components or services used in making a product or providing a service. Make or buy is basically an analysis of avoidable costs.

Typically, the relevant costs are more extensive and care must be taken to determine which activities are relevant, and by how much. Relevant cost to make usually includes variable costs whether manufacturing, selling, or administrative costs; avoidable fixed costs; and opportunity costs. Opportunity costs arises if there are alternative uses of facilities used to make the component.

In a make-or-buy decision, avoidable fixed expenses and additional opportunity costs should be considered. A common make-or-buy opportunity cost is whether some part of the fixed overhead could be avoided by outsourcing. Another typical opportunity cost is if any of the space needed for internal production may be used for something else, such as the creation of a different product or the rental of the space to another company.

Relevant cost to buy usually includes acquisition price and incidental costs related to the purchase such as freight-in, inspection costs, and set-up costs of the component. Choose the option that involves the lowest cost.

Irrelevant costs are those that cannot be avoided regardless of whether the company manufactures or purchases the goods. They are sunk cost or future costs that will continue to exist even if the item is purchased elsewhere.

Do not fail to consider qualitative factors. The following factors should be considered when deciding whether or not to outsource to an external supplier:
• The supplier's reputation for dependability and quality.
• Maintaining core competencies.
• Rights to intellectual property.

Illustrative Problems
1. Garfield Company manufactures Part G for use in its production cycle. The costs per unit for 10,000 units for Part G are as follows:

Direct materials	$ 3
Direct labor	15
Variable overhead	6
Fixed overhead	8

Odie Company has offered to sell Garfield 10,000 units of Part G for $30 per unit. If Garfield accepts Odie's offer, the released facilities could be used to save P45,000 in relevant costs in the manufacture of Part Hot-Spot. In addition, $5 per unit of the fixed overhead applied to Part G-Spot would be totally eliminated. What alternative is more desirable and by what amount is it more desirable?

2. Regis Company manufactures plugs used in its manufacturing cycle at a cost of $36 per unit that includes $8 of fixed overhead. Regis needs 30,000 of these plugs annually, and Orlan Company has offered to sell these units to Regis at $33 per unit. If Regis decides to purchase the plugs, $60,000 of the annual fixed overhead applied will be eliminated, and the company may be able to rent the facility previously used for manufacturing the plugs.

a. If Regis Company purchases the plugs but does not rent the unused facility, how much will be the per unit savings/loss?

b. If the plugs are purchased and the facility rented, Regis Co. wishes to realize $100,000 in savings annually. To achieve this goal, how much is the minimum annual rent on the facility?

ACCEPT/ REJECT A SPECIAL ORDER

Accept or reject a special order involves a situation where the company should accept a special order which usually requires a price much lower than the regular selling price. Special-order decisions are examples of tactical decisions with a short-term focus. Increasing short-term profits is the limited objective represented by this type of decision.

Only cost incurred are relevant. For this decision situation, Avoidable Cost is NOT RELEVANT. This is the only exception to the rule. Most often avoidable cost is relevant in decision making, but not under special order because the objective of the decision maker is to identify the minimum price of the special order. The minimum price consists of Variable costs incurred plus any fixed costs incurred exclusively for the special order and opportunity costs.

The decision guide is to accept the special order provided that incremental revenues are greater than incremental costs of accepting the special order.

If the firm has excess capacity, it must determine the variable costs connected with the special order (unit variable costs multiplied by the number of units) as well as any additional fixed costs (avoidable fixed costs) that may be incurred as a result of taking the order. Relevant costs are those that determine the lowest acceptable price.

The usual sale price is the minimal acceptable price **if the company is at or near capacity**. A special order should only be taken if the price given surpasses the regular price when there is no excess capacity. When a company is at maximum capacity, it must also examine whether accepting the order would result in the loss of more profitable sales. It's important to consider the potential costs of lost sales with a larger contribution margin.

Qualitative factors include reaction of existing customers on concessions granted to the new customer, and potential future profitability of the new customer. It also includes reactions of competitors.

Illustrative Problem

1. Stephen Company manufactures men's caps. The projected income statement for the year before any special order is as follows:

	Amount	Per Unit
Sales	$400,000	P20
Cost of goods sold	320,000	16
Gross margin	80,000	4
Selling expenses	30,000	3
Operating income	$ 50,000	P 1

Fixed costs included in above projected income statement are $80,000 in cost of goods sold and $9,000 in selling expenses.

A special order offering to buy 2,000 caps for $17 each was made to Stephen. No additional selling expenses will be incurred if the special order is accepted. Stephen has the capacity to manufacture 2,000 more caps. As a result of the special order, how much would the operating income increase?

2. Woods Co. is approached by 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

Woods Co. has excess capacity. The customer wants the product to use a higher grade material, so direct material costs will increase by $30 per unit.

Required:

a. What is the minimum acceptable price of this one-time-only special order?
b. Other than price, what other items Woods Co consider before accepting this one-time-only special order?
c. What is the minimum price if there is no idle capacity?

3. Kator Inc. manufactures industrial components. One of its products that is used as a sub-component in auto manufacturing is KB-96. The selling price and cost per unit data for KB-96 is as follows:

Selling price	$150
Direct materials	20
Direct labor	15
Variable manufacturing overhead	12
Fixed manufacturing overhead	30
Variable selling	3
Fixed selling and administrative	10
Total costs	90
Operating Margin	$ 60

a. Kator Inc. received a special, one-time order for 1,000 KB-96 parts. Assuming Kator has excess manufacturing capacity, the minimum unit price for this special one-time order should not be lower than?

b. Kator Inc. received a special, one-time order for 1,000 KB-96 parts. However, Kator has an alternative use of its capacity to produce an LB-64 part, which would produce a contribution of $10,000 using the same amount of capacity. The minimum unit price for this special, one-time KB-96-part order should not be lower than?

KEEP OR DROP DECISION

Keep/continue or drop decision involves an analysis if a business segment, which may be a product line, a department, or a branch be discontinued. With keep-or-drop decisions, revenues and costs that are directly attributable to a segment must be identified. If a segment is dropped, then only the traceable revenues and costs should vanish. It's important to figure out what costs can be avoided and opportunity costs. Only those costs that can be avoided should be considered in the decision-making process.

An analysis should be performed to determine the difference between traceable fixed costs and common fixed costs for the product. If the product is dropped, the **traceable fixed costs** are potentially avoided expenditures. **Common fixed costs** are inevitable costs that will persist regardless of whether the product is discarded or retained.

The decision guide is 'continue' provided that the Contribution margin is positive if there are no avoidable fixed costs. Continue if the Segment Income is positive. Segment income is computed as Contribution Margin less Avoidable Fixed Cost. If the amount saved in avoidable fixed expenses is larger than the amount lost in contribution margin, the segment should be eliminated because total net operating income should improve.

Do not fail to consider qualitative factors. Qualitative factors include reaction of customers if product is discontinued, and effect on employees if discontinued.

A shutdown point is a level of operations at which a company experiences no benefit for continuing operations and therefore decides to shut down temporarily—or in some cases permanently. It results from the combination of output and price where the company earns just enough revenue to cover its total variable costs and avoidable fixed cost. At Shut-down point the Segment Income is equal to Zero.

Illustration

1. ABD Realty manages five apartment complexes in a three-state area. Shown below are summary income statements for each apartment complex.

ABD Realty
Summary Income Statements
(in thousands)

	One	Two	Three	Four	Five
Rental Income	$1,000	$1,210	$2,347	$1,878	$1,065
Expenses	800	1,300	2,600	2,400	1,300
Profit	$ 200	$ (90)	$ (253)	$ (522)	$(235)

Included in the expenses is $1,200,000 of corporate overhead allocated to the apartment complexes based on rental income. The apartment complex(es) that ABD should consider selling is (are)?

2. The Silk Company has two divisions - North and South.
The divisions have the following revenues and expenses:

	North	**South**
Sales	$720,000	$350,000
Less: Costs and expenses		
Variable costs	370,000	240,000
Traceable fixed costs	130,000	80,000
Allocated common corporate costs	120,000	50,000
Operating income loss	$100,000	$(20,000)

* Traceable fixed costs is avoidable if a division is closed.

How much is the Company's net income if division South was discontinued?

3. Zorro Company produced and sells 8,000 units of Product X each year. Each unit of Product X sells for $10 and has a contribution margin of $6. It is estimated that if Product X is discontinued, $51,000 of the $60,000 in fixed costs charged to Product X could be eliminated.

a. What is the overall increase/decrease in income if Product X was discontinued?
b. Compute for the shut-down point

SELL OR PROCESS FURTHER

Sell or process further is a situation that analyzes the profitability of a joint product if it is sold as is at the split-off point or processed further. Often, joint products are sold at the split-off point. The key point in this decision is that all of the joint production costs are irrelevant to the sell or process further decision. By the time the split-off point is reached, all joint costs are sunk, and therefore, irrelevant.

Decide to process further only if incremental revenue is greater than further processing cost or cost incurred beyond the split-off point. Ignore joint costs, regardless of allocated or not, because it is sunk cost.

Illustration

Cole Co. owns a large processing line which segregates coconuts into its components upon contact with the breaker of the machine. Presently, it sells the coconut meat, juice, shell and husk to various manufacturers. A feasibility study is being made to process its components into "buko pies" for the meat, “book juice" for the juice, flower pots for the shells, and fuel briquets for the husk. At the segregation point, you gathered the following data per unit:

	Meat	**Juice**	**Shell**	**Husk**
Selling price	$4.00	$2.00	$1.00	$1.00
Allocated joint cost	0.13	0.06	0.03	0.03
Profit(loss)	$3.87	$1.94	$0.97	$0.97

The study shows that after further application of additional manufacturing process, the following is projected:

Selling price	$12.00	$4.00	$2.00	$2.00
Addt'nal proc. cost	3.80	2.90	1.95	1.95

Fixed cost of the plant amounts to P500,000. Interest rate is 12%.

Which product should go through the additional manufacturing process?

OPTIMIZING SCARCE RESOURCES

Best product combination and optimizing scare resources involves a company producing multiple products but is faced with one limited or scarce resource. The limited resource can take the form of labor hours, machine hours, budget and the like.

The decision guide is to prioritize the product with the highest contribution margin per limited resource. If there is idle capacity, the decision would be to prioritize the product that has the highest contribution margin per unit.

If a company is faced with multiple product and multiple limited resources issue, it is wise to use linear programming to determine the best combination of products that will maximize profits. Linear programming utilizes matrix algebra to simultaneously compute for two missing variables. The missing variables are the product combination needed to maximize profits. The same can be computed using the graphical approach.

Linear Programming is a quantitative technique used to determine the optimal mix of limited resources for maximizing profits or minimizing costs. It is very useful in analyzing complex problems.

Objective function is the variable you are trying to maximize. It is denoted as Zmax meaning maximum possible profit and is expressed as Zmax= CM_1 + CM_2 + CMn.. Simply stated it is to total contribution margin of all products sold by

the company. Constraints are the limited resources. It can take the form of machine hours, labor hours, space, budget, or any resource that are consumed or depleted.

Feasible solution is any combination of products being produced and sold. The feasible region in a linear program is the set of all possible feasible solutions. It is usually expressed as $X \geq 0$; $Y \geq 0$. Where X and Y are the products produced. Shadow Price is the cost of relaxing a constraint. It is the opportunity cost of not having one more unit of your limited resource.

Illustrative Problem

1. Homes Company produces three products, with costs and selling prices as shown below:

	PRODUCTS					
	A		B		C	
Selling price per unit	$30	100%	$20	100%	$15	100%
Variable costs per unit	18	60	15	75	6	40
Contribution margin	$12	40%	$ 5	25%	$ 9	60%

A particular machine is a bottleneck. On that machine, 3 machine hours are required to produce each unit of Product A, 1 hour is required to produce each unit of Product B, and 2 hours are required to produce each unit of Product C. In what order should it produce its products?

2. 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?

3. The Mix and Match Company has two products Product X and Product Y, that it manufactures through its production facilities. The contribution margin for Product X is $15 per unit, whereas Product Y's contribution is $25. Each product uses Materials A and B. Product X uses 3 pounds of Material A, and Product Y uses 6 pounds. Product X requires 6 feet of Material B and Product Y uses 4 feet. The company can only purchase 600 pounds of Material A and 880 feet of material B. What is the optimal mix of products to be manufactured?

ECONOMIC VERSUS ACCOUNTING CONCEPTS OF MARGINAL REVENUE AND MARGINAL COSTS

Costs in economics include both explicit costs—such as direct labor, direct material, overhead, and selling, general, and administrative costs—as well as implicit costs. Implicit cost are not recorded in accounting records or used to calculate accounting income. The opportunity cost of capital provided to the firm is an example of implicit costs. Accounting costs only include explicit costs; implicit costs are ignored.

DRILLS

1, Relevant costs refer to
A. All fixed costs.
B. Past costs that are expected to be different in the future.
C. Costs that would be incurred within the relevant range of production.
D. Anticipated future costs that will differ among various alternatives.

2. The relevance of a particular cost to a decision is determined by the
A. Riskiness of the decision.
B. Size of the cost.
C. Accuracy and verifiability of the cost.
D. Potential effect on the decision.

3. Relevant or differential cost analysis
A. Considers all variable and fixed costs as they change with each decision alternative.
B. Takes all variable and fixed costs into account to analyze decision alternatives.
C. Allows the decision maker to group all types of costs together to facilitate decision making.
D. Considers only variable costs as they change with each decision alternative.

4. In order to avoid pitfalls in relevant-cost analysis, management should focus on
A. variable cost items that differ for each alternative.
B. anticipated revenues and costs that differ for each alternative.
C. anticipated fixed costs and variable costs of all alternatives.
D. long-run fixed costs of each alternative.

5. The term incremental cost refers to
A. A cost common to all choices in question and not clearly or feasibly allocable to any of them.
B. The difference in total costs that results from selecting one choice instead of another.
C. A cost that continues to be incurred in the absence of activity.
D. The profit forgone by selecting one choice instead of another.

6. The term that best refers to past costs that have been incurred and are not relevant to any future decisions is
A. Discretionary costs. B. Sunk costs. C. Full absorption costs. D. Incurred marginal costs.

7. Which one of the following costs would be relevant in short-term decision making?
A. Total variable costs that are the same in the considered alternatives.
B. Incremental fixed costs.
C. All costs of inventory.
D. Opportunity costs that are the same in the considered alternatives.

8. The opportunity cost of making a component part in a factory with no excess capacity is the
A. Variable manufacturing cost of the component.
B. Cost of the production given up in order to manufacture the component.
C. Fixed manufacturing cost of the component.
D. Net benefit given up from the best alternative use of the capacity.

9.When a decision is made in an organization, it is selected from a group of alternative courses of action. The loss associated with choosing the alternative that does not maximize the benefit is the
A. Opportunity cost. B. Incremental cost. C. Expected value. D. Net realizable value.

10. When an organization decides on a course of action that is selected from a group of alternative courses of action, the benefit lost by not choosing the best alternative course of action is the
A. Opportunity cost. B. Expected value. C. Net realizable value. D. Incremental cost.

11. Johnson waits two hours in line to buy a ticket to an NCAA Final Four Tournament. The opportunity cost of buying the $200 ticket is
A. Johnson's best alternative use of the $200.
B. the value of the $200 to the ticket agent.
C. Johnson's best alternative use of both the $200 and the two hours spent in line.

D. Johnson's best alternative use of the two hours it took to wait in line.

12. Incremental fixed costs are
A. Equal to historical costs.
B. Relevant to decision making.
C. Not used for decision making.
D. The same as variable costs.

13. When making a decision to increase the robotic automation equipment in an existing facility, a firm takes all of the following into consideration except
A. Technological efficiency.
B. Opportunity cost.
C. Economies of scale.
D. The initial cost of the current facility.

14. In a make-versus-buy decision, the relevant costs include variable manufacturing costs as well as
A. General office costs. B. Factory management costs. C. Avoidable fixed costs. D. Depreciation

15. Costs relevant to a make-or-buy decision include variable labor and variable materials as well as
A. Unavoidable fixed costs. B. Avoidable fixed costs. C. Depreciation. D. Property taxes.

16. Marginal revenue is
A. The change in total revenue associated with increasing prices.
B. Greater than price in pure competition.
C. Equal to price in monopolistic competition.
D. The change in total revenue associated with producing and selling one more unit.

17.Total unit costs are
A. Irrelevant in marginal analysis.
B. Relevant for cost-volume-profit analysis.
C. Needed for determining sunk costs.
D. Independent of the cost system used to generate them.

18. When management must decide to accept or reject a one-time-only special order, given sufficient idle capacity, which one of the following is not relevant to the decision?
A. Variable costs. B. Absorption costs. C. Differential costs. D. Direct costs.

19. Which costs are relevant to the decision to further process a product beyond its current state?
A. Fixed factory overhead. B. Absorption costs. C. Joint costs. D. Incremental costs.

20. In differential cost analysis, which one of the following best fits the description of a sunk cost?
A. Purchasing department costs incurred in acquiring material.
B. Direct materials required in the manufacture of a table.
C. Cost of the forklift driver to move the material to the manufacturing floor.
D. Cost of a large crane used to move materials.

21. A printing company is considering replacing an old printing press. The old printing press has a book value of $24,000 and a trade-in value of $14,000. A new printing press would cost $85,000 after trade-in of the old press. It is estimated that the new printing press would reduce operating costs by $20,000 per year. If the company decides not to purchase the new press, the $85,000 could instead be used to retire debt that is currently costing $9,000 per year in interest. Which of the given amounts is an example of a sunk cost?
A. The trade-in value of the old printing press.
B. The book value of the old printing press.
C. The estimated reduction in operating costs.
D. The interest on the existing debt.

22. In a joint manufacturing process, joint costs incurred prior to a decision as to whether to process the products after the split-off point should be viewed as
A. standard costs. B. differential costs. C. relevant costs. D. sunk costs.

23. There is a market for both product X and product Y. Which of the following costs and revenues would be most relevant in deciding whether to sell product X or process it further to make product Y?
A. Additional cost of making X, given the cost of making Y, and additional revenue from Y.
B. Total cost of making X and the revenue from sale of X and Y.
C. Additional cost of making Y, given the cost of making X, and additional revenue from Y.
D. Total cost of making Y and the revenue from sale of Y.

Management accountants are frequently asked to analyze various decision situations including the following.
1. Alternative uses of plant space, to be considered in a make/buy decision.
2. Joint production costs incurred, to be considered in a sell-at-split versus a process-further decision.
3. Research and development costs incurred in prior months, to be considered in a product-introduction decision.
4. The cost of a special device that is necessary if a special order is accepted.
5. The cost of obsolete inventory acquired several years ago, to be considered in a keep-versus-disposal decision.

24. The costs described in situations 2, 3, and 5 are
A. Differential costs. B. Discretionary costs. C. Relevant costs. D. Sunk costs.

25. The costs described in situations 1 and 4 are
A. Prime costs. B. Discretionary costs. C. Relevant costs. D. Sunk costs.

Management accountants are frequently asked to analyze various decision situations, including the following:
I. The cost of a special device that is necessary if a special order is accepted.
II. The cost proposed annually for the plant service for the grounds at corporate headquarters.
III. Joint production costs incurred, to be considered in a sell-at-split versus a process-further decision.
IV. The costs associated with alternative uses of plant space, to be considered in a make/buy decision.
V. The cost of obsolete inventory acquired several years ago, to be considered in a keep-versus-disposal decision.

26. The costs described in situations I and IV are:
A. Discretionary costs. B. Prime costs. C. Sunk costs. D. Relevant costs.

27. The cost described in situation II is a
A. Prime cost. B. Relevant cost. C. Discretionary cost. D. Imputed cost.

28. A company's approach to a make-or-buy decision
A. Should use absorption (full) costing.
B. Depends on whether the company is operating at or below normal volume.
C. Depends on whether the company is operating at or below breakeven.
D. Involves an analysis of avoidable costs.

29. GiantCo has received an offer from PatriotCo to produce units that GiantCo currently produces and sells. The unit price quoted by PatriotCo is higher than GiantCo's variable production cost per unit, but lower than the price at which GiantCo can market the units. Under which circumstance would GiantCo's profits increase by purchasing units from PatriotCo?
A. GiantCo's fixed overhead would remain the same if GiantCo purchased units from PatriotCo.
B. Market demand for the product exceeds GiantCo's capacity.
C. GiantCo's administrative costs are zero.
D. GiantCo has significant sunk costs.

30. An organization's sales revenue is expected to be $72,600, a 10% increase over last year. For the same period, total fixed costs of $22,000 are expected to be the same as last year. If the number of units sold is expected to increase by 1,100, the marginal revenue per unit will be:
A. $4 B. $6 C. $46 D. $20

31. Copeland, Inc. produces X-547 in a joint manufacturing process. The company is studying whether to sell X-547 at the split-off point or upgrade the product to become Xylene. The following information has been gathered.
1. Selling price per pound of X-547.
2. Variable manufacturing costs of the upgrade process.
3. Avoidable fixed costs of the upgrade process.
4. Selling price per pound of Xylene.
5. Joint manufacturing costs to produce X-547.

Which of these items should be reviewed when making the upgrade decision?
A. 1, 2, 3, 4, and 5. B. 1, 2, and 4. C. 1, 2, 4, and 5. D. 1, 2, 3, and 4.

32. The loss of a key customer has temporarily caused Bedford Machining to have some excess manufacturing capacity. Bedford is considering the acceptance of a special order, one that involves Bedford's most popular product. Consider the following types of costs.

I. Variable costs of the product
II. Fixed costs of the product
III. Direct fixed costs associated with the order
IV. Opportunity cost of the temporarily idle capacity

Which one of the following combinations of cost types should be considered in the special order acceptance decision?

A. I, III, and IV. B. II and III. C. I and IV. D. I and II.

33. Elgers' Company produces valves for the plumbing industry. Elgers' per unit sales price and variable costs are as follows.

Sales price $12 Variable costs $8

Elgers' practical plant capacity is 40,000 units. Elgers' total fixed costs aggregate $48,000 and it has a 40% effective tax rate. The maximum net profit that Elgers can earn is

A. $96,000. B. $48,000. C. $67,200. D. $112,000.

34. Phillips and Company produces educational software. Its current unit cost, based upon an anticipated volume of 150,000 units, is as follows:

Selling price	$150
Variable costs	60
Contribution margin	90
Fixed costs	60
Operating income	30

Sales for the coming year are estimated at 175,000 units, which is within the relevant range of Phillip's cost structure. Cost management initiatives are expected to yield a 20% reduction in variable costs and a reduction of $750,000 in fixed costs. Phillip's cost structure for the coming year will include a

A. contribution margin ratio of 68% and operating income of $7,050,000.
B. total contribution margin of $15,300,000 and fixed costs of $8,250,000.
C. variable cost ratio of 32% and operating income of $9,600,000.
D. per unit contribution margin of $72 and fixed costs of $55.

35. Harper Products' cost information for the normal range of output in a month is shown below.

Output in units	**Total Cost**
20,000	$3,000,000
22,500	3,325,000
25,000	3,650,000

What is Harper's short-run marginal cost?

A. $130. B. $150. C. $146. D . $26.

36. Adams Corporation's goal is for operating income to equal 6% of sales. Adams estimates that the highest selling price the market will bear is $115 per unit. Adams expects to sell 100,000 units, incur fixed costs of $3,500,000, and has an effective income tax rate of 40%. To achieve these plans, the target variable cost per unit must be

A. $73.10. B. $108.10. C. $62.75. D. $68.50.

37. Oak Fine Furnishings manufactures a wide range of home furnishings. One of their products is an oak headboard. The company currently sells 4,000 headboards at an average price of $100 per unit. To manufacture the headboards, the variable costs are $55 per unit and the total fixed costs assigned to the oak headboard are $150,000. If the sale of headboards increases by 50% and all else remains constant, this would result in

A. a gross margin of $380,000.
B. fixed costs of $225,000.
C. earnings before interest and taxes of $120,000.
D. a 50% increase in earnings before interest and taxes.

38. A manufacturing company's primary goals include product quality and customer satisfaction. The company sells a product, for which the market demand is strong, for $50 per unit. Due to the capacity constraints in the Production Department, only 300,000 units can be produced per year. The current defective rate is 12% (i.e., of the 300,000 units produced, only 264,000 units are sold and 36,000 units are scrapped). There is no revenue recovery when defective units are scrapped. The full manufacturing cost of a unit is $29.50, including:

Direct materials	$17.50
Direct labor	4.00
Fixed manufacturing overhead	8.00

The company's designers have estimated that the defective rate can be reduced to 2% by using a different direct material. However, this will increase the direct materials cost by $2.50 per unit to $20 per unit. The net benefit of using the new material to manufacture the product will be:

A. $(120,000) B. $1,425,000 C. $750,000 D. $120,000

39. Power Systems, Inc. manufactures jet engines for the armed forces on a cost-plus basis. The cost of a particular jet engine the company manufactures is shown as follows.

Direct materials	$200,000
Direct labor	150,000
Overhead:	
Supervisor's salary	20,000
Fringe benefits on direct labor	15,000
Depreciation	12,000
Rent	11,000
Total cost	**$408,000**

If production of this engine were discontinued, the production capacity would be idle and the supervisor would be laid off. When asked to bid on the next contract for this engine, the minimum unit price that Power Systems should bid is

A. $397,000. B. $385,000 . C. $365,000. D. $408,000.

40. Raymund Inc. currently sells its only product to Mall-Stores. Raymund has received a one-time-only order for 2,000 units from another buyer. Sale of the special order items will not require any additional selling effort. Raymund has a manufacturing capacity to produce 7,000 units. Raymund has an effective income tax rate of 40%. Raymund's Income Statement, before consideration of the one-time-only order, is as follows.

Sales (5,000 units at $20 per unit)		$100,000
Variable manufacturing costs	$50,000	
Variable selling costs	15,000	65,000
Contribution margin		35,000
Fixed manufacturing costs	16,000	
Fixed selling costs	4,000	20,000
Operating income		15,000
Income taxes		6,000
Net income		$9,000

In negotiating a price for the special order, Raymund should set the minimum per unit selling price at

A. $17. B. $10. C. $18. D. $13.

41. Kator Co. is a manufacturer of industrial components. One of their products that is used as a subcomponent in auto manufacturing is KB-96. This product has the following financial structure per unit:

Selling price	$150
Direct materials	$ 20
Direct labor	15
Variable manufacturing overhead	12
Fixed manufacturing overhead	30
Shipping and handling	3
Fixed selling and administrative	10
Total costs	$ 90

Kator Co. has received a special, one-time, order for 1,000 KB-96 parts. Assume that Kator is operating at full capacity and that the contribution margin of the output that would be displaced by the special order is $10,000. The minimum price that is acceptable, using the original data, for this one-time special order is in excess of

A. $87 B. $70 C. $60 D. $100

42. Johnson Company manufactures a variety of shoes and has received a special one-time-only order directly from a wholesaler. Johnson has sufficient idle capacity to accept the special order to manufacture 15,000 pairs of sneakers at a price of $7.50 per pair. Johnson's normal selling price is $11.50 per pair of sneakers. Variable manufacturing costs are $5.00 per pair and fixed manufacturing costs are $3.00 a pair. Johnson's variable selling expense to obtain an order for its normal line of sneakers is $1.00 per pair. What would the effect on Johnson's operating income be if the company accepted the special order?

A. Increase by $22,500.
B. Increase by $37,500.
C. Increase by $52,500.
D. Decrease by $60,000.

43. A manufacturer has been approached by a new customer who wants to place a one-time order for a component similar to one that the manufacturer makes for another customer. Existing sales will not be affected by acceptance of this order. The manufacturer has a policy of setting its targeted selling price at 60% over full manufacturing cost. The manufacturing costs and the targeted selling price for the existing product are presented as follows.

Direct materials	$ 2.30
Direct labor	3.60
Variable manufacturing overhead (applied at 75% of direct labor cost)	2.70
Fixed manufacturing overhead (applied at 150% of direct labor cost)	5.40
Total manufacturing cost	$14.00
Markup (60% of full manufacturing cost)	8.40
Targeted selling price	$22.40

The manufacturer has excess capacity to produce the quantity of the component desired by the new customer. The direct materials used in the component for the new customer would cost the manufacturer $0.25 less than those used in the component currently being made. The variable selling expenses (packaging and shipping) would be the same, or $0.90 per unit. Under these circumstances, the minimum unit price at which the manufacturer would accept the special order is one exceeding:

A. $14.00 B. $8.35 C. $9.25 D. $14.80

44. Green Corporation builds custom-designed machinery. A review of selected data and the company's pricing policies revealed the following:

A 10% commission is paid on all sales orders. Variable and fixed factory overheads total 40% and 20%, respectively, of direct labor. Corporate administrative costs amount to 10% of direct labor. When bidding on jobs, Green adds a 25% markup to the total of all factory and administrative costs to cover income taxes and produce a profit. The firm's income tax rate is 40%. The company expects to operate at a maximum of 80% of practical capacity.

Green recently received an invitation to bid on the manufacture of some custom machinery for Kennendale, Inc. For this project, Green's production accountants estimate the material and labor costs will be $66,000 and $120,000, respectively. Accordingly, Green submitted a bid to Kennendale in the amount of $375,000. Feeling Green's bid was too high, Kennendale countered with a price of $280,000. Which one of the following options should be recommended to Green's management?

A. Reject the counteroffer because the order will decrease operating income.
B. Accept the counteroffer because the order will increase operating income.
C. Accept the counteroffer even though the order will decrease operating income.
D. Reject the counteroffer even though the order will increase operating income.

45. National Technology Corporation manufactures integrated computer components. Its unit cost structure, based upon a volume of 300,000 units, is as follows.

	Variable Costs	Fixed Costs	Total Costs
Direct material	$ 3.50		$ 3.50
Direct labor	9.00		9.00
Packaging	2.00		2.00
Manufacturing O/H	3.00	$ 6.50	9.50
Marketing costs	2.50	8.00	10.50
Administrative costs	4.00	4.50	8.50
Total costs	$24.00	$19.00	$43.00

A foreign company recently approached National with an order of 50,000 units of a specially designed component at $35 per unit. The order will require specialized procurement costs of $150,000 and only one-half of the variable costs associated with the administrative area will be needed. Otherwise, cost behavior will remain the same.

Adequate capacity is available to handle this request. What is the relevant unit cost to be considered by National in making a decision on this offer?

A. $43.00. B. $25.00. C. $22.00. D. $24.00.

46. Gardener Company currently is using its full capacity of 25,000 machine hours to manufacture product XR-2000. LJB Corporation placed an order with Gardener for the manufacture of 1,000 units of KT-6500. LJB would normally manufacture this component. However, due to a fire at its plant, LJB needs to purchase these units to continue manufacturing other products. This is a one time special order. The following reflects unit cost data, and selling prices.

	KT-6500	XR-2000
Material	$ 27	$ 24
Direct labor	12	10
Variable overhead	6	5
Fixed overhead	48	40
Variable selling & administrative	5	4
Fixed selling & administrative	12	10
Normal selling price	$125	$105
Machine hours required	3	4

What is the minimum unit price that Gardener should charge LJB to manufacture 1,000 units of KT-6500?

A. $125.00. B. $96.50. C. $93.00. D. $110.00.

Richardson Motors uses 10 units of Part No. T305 each month in the production of large diesel engines. The cost to manufacture one unit of T305 is presented as follows.

Direct materials	$ 2,000
Materials handling (20% of direct materials cost)	400
Direct labor	16,000
Manufacturing overhead (150% of direct labor)	24,000
Total manufacturing cost	$42,400

Materials handling, which is not included in manufacturing overhead, represents the direct variable costs of the receiving department that are applied to direct materials and purchased components on the basis of their cost. Richardson's annual manufacturing overhead budget is one-third variable and two-thirds fixed. Simpson Castings, one of Richardson's reliable vendors, has offered to supply T305 at a unit price of $30,000.

47. If Richardson Motors purchases the ten T305 units from Simpson Castings, the capacity Richardson used to manufacture these parts would be idle. Should Richardson decide to purchase the parts from Simpson, the out-of-pocket cost per unit of T305 would

A. Decrease $6,400. B. Decrease $12,400. C. Increase $9,600. D. Increase $3,600.

48. Assume Richardson Motors could use the idle capacity to manufacture another product that would contribute $104,000 per month. If Richardson chooses to manufacture the ten T305 units in order to maintain quality control, Richardson's opportunity cost is

A. $88,000. B. $(96,000). C. $8,000. D. $68,000.

49. Aspen Company plans to sell 12,000 units of product XT and 8,000 units of product RP. Aspen has a capacity of 12,000 productive machine hours. The unit cost structure and machine hours required for each product is as follows.

Unit Costs	XT	RP
Materials	$37	$24
Direct labor	12	13
Variable overhead	6	3
Fixed overhead	37	38
Machine hours required	1.0	1.5

Aspen can purchase 12,000 units of XT at $60 and/or 8,000 units of RP at $45. Based on the above, which one of the following actions should be recommended to Aspen's management?

A. Produce XT internally and purchase RP. C. Produce both XT and RP.
B. Produce RP internally and purchase XT. D. Purchase both XT and RP.

50. Regis Company manufactures plugs used in its manufacturing cycle at a cost of $36 per unit that includes $8 of fixed overhead. Regis needs 30,000 of these plugs annually, and Orlan Company has offered to sell these units to Regis at $33 per unit. If Regis decides to purchase the plugs, $60,000 of the annual fixed overhead applied will be eliminated, and the company may be able to rent the facility previously used for manufacturing the plugs. If the plugs are purchased and the facility rented, Regis Company wishes to realize $100,000 in savings annually. To achieve this goal, the minimum annual rent on the facility must be

A. $40,000. B. $190,000. C. $10,000. D. $70,000.

Stewart Industries has been producing two bearings, components B12 and B18, for use in production.

	B12	**B18**
Machine hours required per unit	2.5	3.0
Standard cost per unit:		
Direct material	$ 2.25	$ 3.75
Direct labor	4.00	4.50
Manufacturing overhead:		
Variable (See Note 1)	2.00	2.25
Fixed (See Note 2)	3.75	4.50
	$12.00	**$15.00**

Stewart's annual requirement for these components is 8,000 units of B12 and 11,000 units of B18. Recently, Stewart's management decided to devote additional machine time to other product lines resulting in only 41,000 machine hours per year that can be dedicated to the production of the bearings. An outside company has offered to sell Stewart the annual supply of the bearings at prices of $11.25 for B12 and $13.50 for B18. Stewart wants to schedule the otherwise idle 41,000 machine hours to produce bearings so that the company can minimize its costs (maximize its net benefits).

Note 1. Variable manufacturing overhead is applied on the basis of direct labor hours.
Note 2. Fixed manufacturing overhead is applied on the basis of machine hours.

51. The net benefit (loss) per machine hour that would result if Stewart accepts the supplier's offer of $13.50 per unit for Component B18 is

A. $(1.75) B. $0.50. C. $1.75 D. $(1.00)

52. Assume that Stewart's idle capacity of 41,000 machine hours has a traceable unavoidable annual fixed cost of $44,000 that will continue if the capacity is not used. The maximum price Stewart would be willing to pay a supplier for component B18 is

A. $14.00. B. $14.50. C. $10.50. D. $14.10

53. Stewart will maximize its net benefits by
A. Purchasing 4,000 units of B18 and manufacturing the remaining bearings.
B. Purchasing 11,000 units of B18 and manufacturing 8,000 units of B12.
C. Purchasing 8,000 units of B12 and manufacturing 11,000 units of B18.
D. Purchasing 4,800 units of B12 and manufacturing the remaining bearings.

Refrigerator Company manufactures ice-makers for installation in refrigerators. The costs per unit, for 20,000 units of ice-makers, are as follows:

Direct materials	$ 7
Direct labor	12
Variable overhead	5
Fixed overhead	10
Total costs	$34

54. Cool Compartments Inc. has offered to sell 20,000 ice-makers to Refrigerator Company for $28 per unit. If Refrigerator accepts Cool Compartments' offer, the facilities used to manufacture ice-makers could be used to produce water filtration units. Revenues from the sale of water filtration units are estimated at $80,000, with variable costs amounting to 60% of sales. In addition, $6 per unit of the fixed overhead associated with the manufacture of ice-makers could be eliminated. For Refrigerator Company to determine the most appropriate action to take in this situation, the total relevant costs of make vs. buy, respectively, are
A. $648,000 vs. $528,000.
B. $680,000 vs. $440,000.
C. $600,000 vs. $560,000.
D. $600,000 vs. $528,000.

55. Leslie Corporation manufactures classroom desk chairs and tables. In the present market, the company can sell as many units of product as it can manufacture, but it is constrained by its availability of machine-hour capacity. Sales price and cost information for each unit of product are shown below.

	Desk Chairs	**Tables**
Sales price	$75	$180
Variable costs	60	155
Contribution margin	$15	$ 25

Producing a desk chair requires 1½ machine hours; producing a table requires 2½ machine hours. Which product, if any, is most profitable given the machine-hour constraints?
A. Desk chairs.
B. Both products are equally profitable.
C. There is not enough data to identify the most profitable product.
D. Tables.

56. Listed below are a company's monthly unit costs to manufacture and market a particular product.

Manufacturing costs:			
Direct materials	$2.00	Direct labor	2.40
Variable indirect	1.60	Fixed indirect	1.00
Marketing costs:			
Variable	2.50	Fixed	1.50

The company must decide to continue making the product or buy it from an outside supplier. The supplier has offered to make the product at the same level of quality that the company can make it. Fixed marketing costs would be unaffected, but variable marketing costs would be reduced by 30% if the company were to accept the proposal. What is the maximum amount per unit that the company can pay the supplier without decreasing operating income?
A. $8.50 B. $5.25 C. $7.75 D. $6.75

57. The ABC Company manufactures components for use in producing one of its finished products. When 12,000 units are produced, the full cost per unit is $35, separated as follows:

Direct materials	$ 5	Variable overhead	$10
Direct labor	15	Fixed overhead	5

The XYZ Company has offered to sell 12,000 components to ABC for $37 each. If ABC accepts the offer, some of the facilities currently being used to manufacture the components can be rented as warehouse space for $40,000.

However, $3 of the fixed overhead currently applied to each component would have to be covered by ABC's other products. What is the differential cost to the ABC Company of purchasing the components from the XYZ Company?
A. $20,000 B. $24,000 C. $44,000 D. $8,000

58. Cohasset Company currently manufactures all component parts used in the manufacture of various hand tools. A handle is used in three different tools. The unit cost budget for 20,000 handles is

Direct material	$0.60
Direct labor	0.40
Variable overhead	0.10
Fixed overhead	0.20
Total unit cost	$1.30

R&M Steel has offered to supply 20,000 handles to Cohasset for $1.25 each, delivered. If Cohasset currently has idle capacity that cannot be used, accepting the offer will
A. Increase the handle unit cost by $0.05. C. Decrease the handle unit cost by $0.05.
B. Decrease the handle unit cost by $0.15. D. Increase the handle unit cost by $0.15.

59. Milton Manufacturing occasionally has capacity problems in its metal shaping division, where the chief cost driver is machine hours. In evaluating the attractiveness of its individual products for decision-making purposes, which measurement tool should the firm select?
A. If machine hours do not constrain the number of units produced, gross profit. If machine hours constrain the number of units produced, contribution margin.
B. If machine hours do not constrain the number of units produced, contribution margin. If machine hours constrain the number of units produced, contribution margin per machine hour.
C. If machine hours do not constrain the number of units produced, contribution margin per machine hour. If machine hours constrain the number of units produced, contribution margin.
D. If machine hours do not constrain the number of units produced, contribution margin. If machine hours constrain the number of units produced, contribution margin ratio.

60. Geary Manufacturing has assembled the data pertaining to two popular products as follows. Past experience has shown that the fixed manufacturing overhead component included in the cost per machine hour averages $10. Geary has a policy of filling all sales orders, even if it means purchasing units from outside suppliers.

	Blender	**Electric Mixer**
Direct materials	$ 6	$ 11
Direct labor	4	9
Factory overhead at P16 per hour	16	32
Cost if purchased from an outside supplier	20	38
Annual demand (units)	20,000	28,000

If 50,000 machine hours are available, and Geary Manufacturing desires to follow an optimal strategy, it should
A. Produce 20,000 blenders and 15,000 electric mixers, and purchase all other units as needed.
B. Produce 25,000 electric mixers and purchase all other units as needed.
C. Purchase all units as needed.
D. Produce 20,000 blenders and purchase all other units as needed.

61. Lark Industries accepted a contract to provide 30,000 units of Product A and 20,000 units of Product B. Lark's staff developed the following information with regard to meeting this contract.

	Product A	**Product B**	**Total**
Selling Price	$75	$125	
Variable costs	$30	$48	
Fixed overhead			$1,600,000
Machine hours required	3	5	
Machine hours available			160,000
Cost if outsourced	$45	$60	

Lark's operations manager has identified the following alternatives. Which alternative should be recommended to Lark's management?
A. Make 20,000 units of Product A, utilize the remaining capacity to make Product B, and outsource the remainder.
B. Rent additional capacity of 30,000 machine hours which will increase fixed costs by $150,000.
C. Make 30,000 units of Product A, utilize the remaining capacity to make Product B, and outsource the remainder.
D. Make 25,000 units of Product A, utilize the remaining capacity to make Product B, and outsource the remainder.

Cervine Corporation makes two types of motors for use in various products. Operating data and unit cost information for its products are presented below.

	Product A	***Product B***
Annual unit capacity	10,000	20,000
Annual unit demand	10,000	20,000
Selling price	P100	P 80
Variable manufacturing cost	53	45
Fixed manufacturing cost	10	10
Variable selling & administrative	10	11
Fixed selling & administrative	5	4
Fixed other administrative	2	0
Unit operating profit	$ 20	$ 10
Machine hours per unit	2.0	1.5

Cervine has 40,000 productive machine hours available.

62. The relevant contributions per machine hour for each product to be utilized in making a decision on product priorities for the coming year, are
A. Product A $17.00, Product B $14.00.
B. Product A $20.00, Product B $10.00.
C. Product A $18.50, Product B $16.00.
D. Product A $37.00, Product B $24.00.

63. What is the maximum total contribution margin that Cervine can generate in the coming year?
A. $665,000. B. $980,000. C. $689,992. D. $850,000.

64. Moorehead Manufacturing Company produces two products for which the following data have been tabulated. Fixed manufacturing cost is applied at a rate of $1.00 per machine hour.

Per Unit	**XY-7**	**BD-4**
Selling price	$4.00	$3.00
Variable manufacturing cost	$2.00	$1.50
Fixed manufacturing cost	$0.75	$0.20
Variable selling cost	$1.00	$1.00

The sales manager has had a $160,000 increase in the budget allotment for advertising and wants to apply the money to the most profitable product. The products are not substitutes for one another in the eyes of the company's customers.

Suppose Moorehead has only 100,000 machine hours that can be made available to produce additional units of XY-7 and BD-4. If the potential increase in sales units for either product resulting from advertising is far in excess of this production capacity, which product should be advertised and what is the estimated increase in contribution margin earned?
A. Product BD-4 should be produced, yielding a contribution margin of $187,500.
B. Product XY-7 should be produced, yielding a contribution margin of $75,000.
C. Product BD-4 should be produced, yielding a contribution margin of $250,000.
D. Product XY-7 should be produced, yielding a contribution margin of $133,333.

64. Following are the operating results of the two segments of Parklin Corporation.

	Segment A	SegmentB	Total
Sales	$10,000	$15,000	$25,000
Variable cost of goods sold	4,000	8,500	12,500
Fixed costs of goods sold	1,500	2,500	4,000
Gross margin	$ 4,500	4,000	8,500
Variable selling and administrative	2,000	3,000	5,000
Fixed selling and administrative	1,500	1,500	3,000
Operating income (loss)	$ 1,000	$ (500)	$500

Variable costs of goods sold are directly related to the operating segments. Fixed costs of goods sold are allocated to each segment based on the number of employees. Fixed selling and administrative expenses are allocated equally. If Segment B is eliminated, $1,500 of fixed costs of goods sold would be eliminated. Assuming Segment B is closed, the effect on operating income would be

A. a decrease of $2,000.
B. an increase of $2,000.
C. an increase of $500.
D. a decrease of $2,500.

65. The Furniture Company currently has three divisions: Maple, Oak, and Cherry. The oak furniture line does not seem to be doing well and the president of the company is considering dropping this line. If it is dropped, the revenues associated with the Oak Division will be lost and the related variable costs saved. Also, 50% of the fixed costs allocated to the oak furniture line would be eliminated. The income statements, by divisions, are as follows.

	Maple	Oak	Cherry
Sales	$55,000	$85,000	$100,000
Variable Costs	40,000	72,000	82,000
Contribution Margin	15,000	13,000	18,000
Fixed costs	10,000	14,000	10,200
Operating profit (loss)	$5,000	$(1,000)	$7,800

Which one of the following options should be recommended to the president of the company?

A. Continue operating the Oak Division as discontinuance would result in a $6,000 decline in operating profits.
B. Discontinue the Oak Division which would result in a $7,000 increase in operating profits.
C. Discontinue the Oak Division which would result in a $1,000 increase in operating profits.
D. Continue operating the Oak Division as discontinuance would result in a total operating loss of $1,200.

66. Current business segment operations for Whitman, a mass retailer, are presented below.

	Merchandise	Automotive	Restaurant	Total
Sales	$500,000	$400,000	$100,000	$1,000,000
Variable costs	300,000	200,000	70,000	570,000
Fixed costs	100,000	100,000	50,000	250,000
Operating income (loss)	$100,000	$100,000	$(20,000)	$ 180,000

Management is contemplating the discontinuance of the Restaurant segment since "it is losing money." If this segment is discontinued, $30,000 of its fixed costs will be eliminated. In addition, Merchandise and Automotive sales will decrease 5% from their current levels. What will Whitman's total contribution margin be if the Restaurant segment is discontinued?

A. $220,000. B. $380,000. C. $367,650. D. $160,000.

67. Joe Cooper owns and operates an ice cream truck that he drives through residential neighborhoods to sell five different treats to the area's children. On average, Cooper sells 100 of each type of treat per day for the 120 days per year when the weather is warm enough to generate sales. Four of his products are profitable, but the other, Creamy Delight, indicates a loss as follows:

Selling price/unit	$ 1.75
Cost of each treat	0.80
Truck operating costs/unit	0.37
Joe's salary/unit	0.60
Administrative costs/unit 0.08 Loss/unit	$(0.10)

If Cooper cannot raise his selling price, he should
A. continue to sell Creamy Delight to avoid a decrease in profit of $6,960.
B. discontinue the sales of Creamy Delight to increase his profits by $240.
C. continue to sell Creamy Delight to avoid a decrease in profit of $11,400.
D. discontinue the sales of Creamy Delight to increase his profits by $1,200.

68. The data available for the current year is given below.

	Whole company	**Division 1**	**Division 2**
Variable manufacturing cost of goods sold	$ 400,000	$220,000	$180,000
Unallocated costs (e.g., president's salary)	100,000		
Fixed costs controllable by division managers (e.g., advertising, engineering supervision costs)	90,000	50,000	40,000
Net revenue	1,000,000	600,000	400,000
Variable selling and administrative costs	130,000	70,000	60,000
Fixed costs controllable by others (e.g., depreciation, insurance)	120,000	70,000	50,000

Using the information presented above, the net operating income contributed to the company by Division 1 was:
A. $310,000 B. $260,000 C. $190,000 D. $380,000

69. The Doll House, a very profitable company, plans to introduce a new type of doll to its product line. The sales price and costs for the new dolls are as follows.

Selling price per doll	$100
Variable cost per doll	$60
Incremental annual fixed costs	$456,000
Income tax rate 30%	

If 10,000 of the new dolls are produced and sold, the effect on Doll House's profit (loss) would be
A. $(56,000). B. $(39,200). C. $(176,000). D. $280,000.

70. Capital Company has decided to discontinue a product produced on a machine purchased four years ago at a cost of $70,000. The machine has a current book value of $30,000. Due to technologically mproved machinery now available in the marketplace, the existing machine has no current salvage value. The company is reviewing the various aspects involved in the production of a new product. The engineering staff advised that the existing machine can be used to produce the new product. Other costs involved in the production of the new product will be materials of $20,000 and labor priced at $5,000. Ignoring income taxes, the costs relevant to the decision to produce or not to produce the new product would be
A. $95,000. B. $55,000. C. $30,000. D. $25,000.

71. Condensed monthly operating income data for Korbin Inc. for May follows:

	Urban Store	**Suburban Store**	**Total**
Sales	$80,000	$120,000	$200,000
Variable costs	32,000	84,000	116,000
Contribution margin	$48,000	$36,000	$84,000
Direct fixed costs	20,000	40,000	60,000
Store segment margin	$28,000	$(4,000)	$24,000
Common fixed cost	4,000	6,000	10,000
Operating income	$24,000	$(10,000)	$14,000

Additional information regarding Korbin's operations follows:

One-fourth of each store's direct fixed costs would continue if either store were closed. Korbin allocates common fixed costs to each store on the basis of sales dollars.

Management estimates that closing the Suburban Store would result in a 10% decrease in the Urban Store's sales, while closing the Urban Store would not affect the Suburban Store's sales.
The operating results for May are representative of all months.

Korbin is considering a promotional campaign at the Suburban Store that would not affect the Urban Store. Increasing annual promotional expense at the Suburban Store by $60,000 in order to increase this store's sales by 10% would result in a monthly increase (decrease) in Korbin's operating income during the year (rounded) of
A. $(1,400) B. $7,000 C. $(5,000) D. $487

72. A company has 7,000 obsolete toys carried in inventory at a manufacturing cost of $6 per unit. If the toys are reworked for $2 per unit, they could be sold for $3 per unit. If the toys are scrapped, they could be sold for $1.85 per unit. Which alternative is more desirable (rework or scrap) and what is the total dollar amount of the advantage of that alternative?
A. Scrap, $47,950. B. Rework, $8,050. C. Rework, $36,050. D. Scrap, $5,950.

Whitehall Corporation produces chemicals used in the cleaning industry. During the previous month, Whitehall incurred $300,000 of joint costs in producing 60,000 units of AM-12 and 40,000 units of BM-36. Whitehall uses the units-of-production method to allocate joint costs. Currently, AM-12 is sold at split-off for $3.50 per unit. Flank Corporation has approached Whitehall to purchase all of the production of AM-12 after further processing. The further processing will cost Whitehall $90,000.

73. Concerning AM-12, which one of the following alternatives is most advantageous?
A. Whitehall should process further and sell to Flank if the total selling price per unit after further processing is greater than $5.25, which maintains the same gross profit percentage.
B. Whitehall should process further and sell to Flank if the total selling price per unit after further processing is greater than $5.00.
C. Whitehall should process further and sell to Flank if the total selling price per unit after further processing is greater than $3.00, which covers the joint costs.
D. Whitehall should continue to sell at split-off unless Flank offers at least $4.50 per unit after further processing, which covers Whitehall's total costs.

74. Assume that Whitehall Corporation agreed to sell AM-12 to Flank Corporation for $5.50 per unit after further processing. During the first month of production, Whitehall sold 50,000 units with 10,000 units remaining in inventory at the end of the month. With respect to AM-12, which one of the following statements is correct?
A. The operating profit last month was $50,000, and the inventory value is $15,000.
B. The operating profit last month was $200,000, and the inventory value is $30,000.
C. The operating profit last month was $50,000, and the inventory value is $45,000.
D. The operating profit last month was $125,000, and the inventory value is $30,000.

75. Ross Inc. uses a joint process which yields two products, X and Y. Each product can be sold at its split-off point or processed further. All the additional processing costs are variable and can be traced to each product. Joint production costs are $35,000. Other sales and cost data are as follows.

	Product X	**Product Y**
Sales value at split-off point	$60,000	$35,000
Final sales value if processed further	80,000	50,000
Additional costs beyond split-off	14,000	18,000

Management wants to know whether to sell each product at the split-off point or to process the products further. Which one of the following options should be recommended to Ross' management?
A. Sell both products at the split-off point.
B. Process both products further.
C. Sell Product X at split-off and process Product Y further.
D. Process Product X further and sell Product Y at split-off.

ESSAY

Charlene Roberts is the controller for PARKCO, a company that owns and operates several parking garages in a large Midwestern American city. Recently, the management of PARKCO has been investigating the viability of building a parking garage in an area of the city that has experienced rapid growth. Some years ago, PARKCO acquired the necessary land at a cost of $425,000, and had demolished worthless buildings on the land at a cost of $72,000. Since then, the land has been rented by various construction companies as a temporary storage site for building materials while the construction companies completed projects in the area. PARKCO has averaged revenue of $5,000 per year for this use of the property.

Roberts is currently assembling financial information relating to the proposed garage. In addition to the information already presented, she received from the CFO, John Demming, the following projections:

Number of parking spaces in the proposed garage	840
Number of parking spaces rented at the monthly rate	420
Average number of parkers paying the daily rate (for each of the 20 business days per month)	180
Fixed costs to operate the garage per month	$30,000

Roberts estimates the monthly variable cost of servicing each monthly parker is $12, and that the price of a monthly parking space would be $75. The estimated cost per daily parker is $2, and the daily parking rate is expected to be set at $8. The parking garage would operate 20 business days per month.

Roberts believes, based on PARKCO's past experience with similar garages, that the projected number of monthly and daily parkers was too high. When she questioned Demming he replied, "This garage is going to be built no matter what your past experiences are. Just use the figures I gave you."

REQUIRED:

1. a. Define sunk cost and opportunity cost.
   b. How are these two types of cost recorded in the accounting records?
   c. Identify the sunk costs and opportunity costs, if any, in the PARKCO scenario and show the amount of each.

2. Using the data in the scenario, calculate pre-tax operating income. Show your calculations.

3. Roberts is uncomfortable with the implications of Demming's statement and has turned to IMA's Statement of Ethical Professional Practice for guidance. According to this guidance,
   a. identify the ethical principles that should guide the work of a management accountant.
   b. identify the standards and describe how they would or would not apply in the circumstances described.
   c. identify the steps Roberts should take to resolve this situation.

--- END OF HANDOUTS ---