

The logo consists of the letters 'CMA' in a dark green, serif font, enclosed within a white square that has a subtle drop shadow.

*IMA's Certification for
Accountants and
Financial Professionals
in Business*

CMA 2010 Support Package

**Examination Essay Questions
For Practice**

Introduction

The Institute of Certified Management Accountants (ICMA) is publishing this book of practice questions with answers to help you prepare for the CMA examination. Each question is referenced to the Content Specification Outline (CSO) and the Learning Outcome Statements (LOS). These questions are actual “retired” questions from the CMA exams and are intended to supplement other study materials.

These practice questions will help you test your understanding of the concepts and rules included in your CMA study materials by requiring you to apply those concepts and rules to unique and varying situations. You will encounter different scenarios and applications on your actual examination so it is essential that you understand the underlying concepts. In general, it will not be helpful to you to memorize particular questions.

Essay questions appear in both Part 1 and Part 2 of the CMA exam and combine topics from the part in which they appear. No inference should be made from the lack of practice questions in any topic areas. All topic areas listed in the Content Specification for each exam part can be tested in the essay questions for that part at the difficulty levels shown.

The CMA Program is a rigorous test of your skills and capabilities and requires dedication to be successful. We hope that these practice questions will be a valuable resource as you pursue your goal of certification. Good luck!

CMA Part 1 Essay Practice Questions

(Answers begin on Page 23)

Question 1.1 –Brawn Technology

Brawn Technology, Inc. is a manufacturer of large wind energy systems. The company has its corporate headquarters in Buenos Aires and a central manufacturing facility about 200 miles away. Since the manufacturing facility is so remote, it does not receive the attention or the support from the staff that the other units do. The president of Brawn is concerned about whether proper permits have been issued for new construction work being done to handle industrial waste at the facility. In addition, he wants to be sure that all occupational safety laws and environmental issues are being properly addressed. He has asked the company's internal auditor to conduct an audit focusing on these areas of concern.

REQUIRED:

- A. Identify and describe the two fundamental types of internal audits. Using examples, describe two situations where each type of audit would be applicable.
- B. Referring to Brawn Technology,
 - 1. identify the type of audit that would best address the concerns of the president .
 - 2. identify the objective of this audit.
 - 3. give two reasons why this type of audit would best address the concerns of the president.
- C. Recommend two procedures that could be implemented at Brawn's manufacturing plant that would lessen the president's concerns. Explain each of your recommendations.

CSO: D.2.b. Types of audits conducted by internal auditors

LOS: D.2.e. Define and identify the objectives of a compliance audit and an operational audit

CSO: D.1.a. Internal control structure and management philosophy

LOS: D.1.c. Explain how a company's organizational structure, policies, objectives, and goals, as well as its management philosophy and style, influence the scope and effectiveness of the control environment

Question 1.2 – Carroll Mining

Alex Raminov is a management accountant at Carroll Mining and Manufacturing Company (CMMC), a large processor of ores and minerals. While working late one night to complete the footnotes for the financial statements, Raminov was looking for a file in his supervisor's office and noticed a report regarding procedures for disposing of plant wastes. According to handwritten notes on the face of the report, CMMC had been using a residential landfill in a nearby township to dump toxic coal cleaning fluid wastes over a considerable period of time. The report stated that locating a new dump site was urgent because the current one was nearing capacity.

Raminov realized that it was possible CMMC had been improperly disposing of highly toxic fluids in a landfill that was restricted to residential refuse. Besides the obvious hazards to residents of the area, there could be legal problems if and when the authorities were notified. The financial consequences of clean-up actions, as well as the loss of CMMC's generally good environmental reputation, could be catastrophic for the company.

Raminov asked his supervisor how this item was to be included in the footnotes and inquired whether an accrual for clean-up costs was anticipated. His supervisor told him to "forget about this matter" and that he had no intention of mentioning one word about waste disposal in this year's financial statements.

REQUIRED:

- A.** Using the categories outlined in IMA's Standards of Ethical Professional Practice, identify the standards that are specifically relevant to Alex Raminov's ethical conflict and explain why the standards are applicable to the situation.
- B.** According to the IMA's Standards of Ethical Professional Practice, what further steps, if any, should Raminov take in resolving his ethical dilemma?
- C.** If he continues to be rebuffed by his employer, should Raminov notify the appropriate authorities? Should he anonymously release the information to the local newspaper? Explain your answers.

CSO: E.1.a. Provisions of IMA's "Statement of Ethical Professional Practice"

LOS: E.1.c. Identify and describe relevant standards that may have been violated in a given business situation and explain why the specific standards are applicable

CSO: E.1.b. Resolution of ethical issues

LOS: E.1.d. Recommend a course of action for management accountants or financial managers to take when confronted with an ethical dilemma in the business environment

Question 1.3 – Hi-Quality Productions

Amy Kimbell was recently hired as an accounting manager for Hi-Quality Productions Inc., a publicly-held company producing components for the automotive industry. One division, Alpha, uses a highly automated process that had been outsourced for a number of years because the capital investment required was high and the technology was constantly changing. Two years ago, the company decided to make the necessary capital investment and bring the operation in house. Since all major capital investments must be approved by the Board of Directors, the budget committee for the Alpha Division recommended the \$4 million investment to the Board, projecting a significant cost savings.

In her new job as accounting manager, Kimbell is on the budget committee for the Alpha Division. The Board has requested from the committee a post-audit review of the actual cost savings. While working on the review, Kimbell noted that several of the projections in the original proposal were very aggressive, including an unusually high salvage value and an excessively long useful life. If more realistic projections had been used, Kimbell doubts that the Board would have approved the investment.

When Kimbell expressed her concerns at the next meeting of Alpha's budget committee, she was told that it had been the unanimous decision of the committee to recommend the investment because it was thought to be in the best long-term interest of the company. According to the committee members, the post-audit report would not discuss these issues; the committee members believe that certain adjustments to the review are justified to ensure the success of the Alpha division and the company as a whole.

REQUIRED:

- A.** Using the categories outlined in IMA's Statement of Ethical Professional Practice, identify the standards that are specifically relevant to Kimbell's ethical conflict and explain why the identified standards are applicable to the situation.
- B.** According to IMA's Statement of Ethical Professional Practice, what specific actions should Kimbell take to resolve her ethical conflict?

CSO: E.1.a. Provisions of IMA's "Statement of Ethical Professional Practice"

LOS: E.1.c. Identify and describe relevant standards that may have been violated in a given business situation and explain why the specific standards are applicable

CSO: E.1.b. Resolution of ethical issues

LOS: E.1.d. Recommend a course of action for management accountants or financial managers to take when confronted with an ethical dilemma in the business environment

Question 1.4 – Matchpoint Racquet Club

Matchpoint Racquet Club (MRC) is a sports facility that offers tennis, racquet ball and other physical fitness facilities to its members. MRC owns and operates a large club with 2,000 members in a metropolitan area. The club has experienced cash flow problems over the last five years, especially during the summer months when both court use and new membership sales are low. Temporary bank loans have been obtained to cover the summer shortages.

The owners have decided to take action to improve MRC's net cash flow position. They have asked the club's financial manager to prepare a projected cash budget based on a proposed revised fee structure. The proposal would increase membership fees and replace the hourly tennis and racquet ball court fees with a quarterly charge that would allow unlimited usage of the courts. The new rates would remain competitive when compared to the rates of other clubs in the area. Although there will be some members who do not renew because of the increase in price, management believes that the offer of unlimited court time will increase membership by 10%.

The proposed fee structure is shown below, along with the current membership distribution. The membership distribution is assumed to remain unchanged. All members would be required to pay the quarterly court charges.

Proposed Fee Structure

<u>Membership Category</u>	<u>Annual Membership Fees</u>	<u>Quarterly Court Charges</u>
Individual	\$300	\$50
Student	180	40
Family	600	90

Membership Distribution

Individual	60%
Student	10%
Family	30%

Projected Membership Payment Activity

<u>Quarter</u>	<u>New</u>	<u>Renewed</u>	<u>Court Time in Hours</u>	
			<u>Prime</u>	<u>Regular</u>
1	100	700	5,000	7,000
2	70	330	2,000	4,000
3	50	150	1,000	2,000
4	200	600	5,000	7,000

The average membership during the third quarter is projected to be 2,200 people. Fixed costs are \$157,500 per quarter, including a quarterly depreciation charge of \$24,500. Variable costs are estimated at \$15 per hour of total court usage time.

REQUIRED:

- A. Prepare MRC's cash budget for the third quarter. Assume the opening cash balance is \$186,000, that membership at the beginning of the quarter is 2,000, and that the change to the new pricing structure will be implemented. Include supporting calculations where appropriate.
- B. How would sensitivity analysis help MRC management in the decision-making process?
- C. Identify at least four factors that MRC should consider before implementing this decision.

CSO: A.4.b. Financial budgets

LOS: A.4.w. Demonstrate an understanding of the relationship between the capital expenditure budget, the cash budget, and the pro forma financial statements

CSO: A2. Forecasting techniques

LOS: A.2.n. Identify the benefits and shortcomings of sensitivity analysis

CSO: A.1.b. Characteristics of a successful budget process

LOS: A.1.b. Explain the interrelationships between economic conditions, industry situation, and a firm's plans and budgets

Question 1.5 - TruJeans

TruJeans, a new startup company, plans to produce blue jean pants, customized with the buyer's first name stitched across the back pocket. The product will be marketed exclusively via an internet website. For the coming year, sales have been projected at three different levels: optimistic, neutral, and pessimistic. TruJeans does keep inventory on hand, but prefers to minimize this investment.

The controller is preparing to assemble the budget for the coming year, and is unsure about a number of issues, including the following.

- The level of sales to enter into the budget.
- How to allocate the significant fixed costs to individual units.
- Whether to use job order costing or process costing.

In addition, the controller has heard of kaizen budgeting and is wondering if such an approach could be used by TruJeans.

REQUIRED:

- A. How can the controller use the expected value approach to set the sales level for the budget? What additional information would be needed?
- B. How could the use of variable (direct) costing mitigate the problem of how to allocate the fixed costs to individual units?
- C. Which cost system seems to make more sense for TruJeans, job order costing or process costing? Explain your answer.

CSO: A.2.e. Expected value

LOS: A.2.i. Calculate the expected value of random variables

CSO: C.1.e. Variable (direct) costing

LOS: C.1.f. Demonstrate an understanding of the characteristics of variable (direct) costing

CSO: C.2.a/b Job order costing/Process costing

LOS: C.2.e. Identify and describe the benefits and limitations of each cost accumulation system

Question 1.6 – Sonimad Sawmill

Sonimad Sawmill Inc. (SSI) purchases logs from independent timber contractors and processes the logs into the following three types of lumber products.

- Studs for residential building (e.g., walls, ceilings).
- Decorative pieces (e.g., fireplace mantels, beams for cathedral ceilings).
- Posts used as support braces (e.g., mine support braces, braces for exterior fences around ranch properties).

These products are the result of a joint sawmill process that involves removal of bark from the logs, cutting the logs into a workable size (ranging from 8 to 16 feet in length), and then cutting the individual products from the logs, depending upon the type of wood (pine, oak, walnut, or maple) and the size (diameter) of the log. The joint process results in the following costs and output of products for a typical month.

Joint production costs:

Materials (rough timber logs)	\$ 500,000
Debarking (labor and overhead)	50,000
Sizing (labor and overhead)	200,000
Product cutting (labor and overhead)	<u>250,000</u>
Total joint costs	<u>\$1,000,000</u>

Product yield and average sales value on a per unit basis from the joint process are as follows.

<u>Product</u>	<u>Monthly Output</u>	<u>Fully Processed Sales Price</u>
Studs	75,000	\$ 8
Decorative pieces	5,000	100
Posts	20,000	20

The studs are sold as rough-cut lumber after emerging from the sawmill operation without further processing by SSI. Also, the posts require no further processing. The decorative pieces must be planed and further sized after emerging from the SSI sawmill. This additional processing costs SSI \$100,000 per month and normally results in a loss of 10% of the units entering the process. Without this planning and sizing process, there is still an active intermediate market for the unfinished decorative pieces where the sales price averages \$60 per unit.

REQUIRED:

- A. Based on the information given for Sonimad Sawmill Inc., allocate the joint processing costs of \$1,000,000 to each of the three product lines using the
1. relative sales value method at split-off.
 2. physical output (volume) method at split-off.
 3. estimated net realizable value method.

- B. Prepare an analysis for Sonimad Sawmill Inc. to compare processing the decorative pieces further as they presently do, with selling the rough-cut product immediately at split-off and recommend which action the company should take. Be sure to provide all calculations.

CSO: C.1.f. Joint and by-product costing

LOS: C.1.1. Determine the allocation of joint product and by-product costs using the physical measure method, the sales value at split-off method, constant gross profit (gross margin) method, and the net realizable value method

Question 1.7 – Alyssa Manufacturing

Alyssa Manufacturing produces two items in its Trumbull Plant: Tuff Stuff and Ruff Stuff. Since inception, Alyssa has used only one manufacturing overhead pool to accumulate costs. Overhead has been allocated to products based on direct labor hours.

Until recently, Alyssa was the sole producer of Ruff Stuff and was able to dictate the selling price. However, last year Marvella Products began marketing a comparable product at a price below the standard costs developed by Alyssa. Market share has declined rapidly, and Alyssa must now decide whether to meet the competitive price or to discontinue the product line. Recognizing that discontinuing the product line would place additional burden on its remaining product, Tuff Stuff, Alyssa is using activity-based costing to determine if it would show a different cost structure for the two products.

The two major indirect costs for manufacturing the products are power usage and set-up costs. Most of the power usage is used in fabricating, while most of the set-up costs are required in assembly. The set-up costs are predominantly for the Tuff Stuff product line. A decision was made to separate the Manufacturing Department costs into two activity centers: (1) Fabricating using machine hours as the cost driver (activity base), and (2) Assembly using the number of set-ups as the cost driver (activity base).

Manufacturing Department Annual Budget Before Separation of Overhead

	<u>Total</u>	<u>Product Line</u>	
		<u>Tuff Stuff</u>	<u>Ruff Stuff</u>
Number of units		20,000	20,000
Direct labor*		2 hrs./unit	3 hrs./unit
Total direct labor	\$800,000		
Direct material		\$5.00/unit	\$3.00/unit
Budgeted overhead:			
Indirect labor	\$ 24,000		
Fringe benefits	5,000		
Indirect material	31,000		
Power	180,000		
Set-up	75,000		
Quality assurance	10,000		
Other utilities	10,000		
Depreciation	15,000		

*Direct labor hourly rate is the same in both departments

Manufacturing Department
Cost Structure After Separation of Overhead into Activity Pools

	<u>Fabrication</u>	<u>Assembly</u>
Direct labor	75%	25%
Direct material	100%	0%
Indirect labor	75%	25%
Fringe benefits	80%	20%
Indirect material	\$20,000	\$11,000
Power	\$160,000	\$20,000
Set-up	\$5,000	\$70,000
Quality assurance	80%	20%
Other utilities	50%	50%
Depreciation	80%	20%

<u>Activity Base</u>	<u>Tuff Stuff</u>	<u>Ruff Stuff</u>
Machine hours per unit	4.4	6.0
Number of set-ups	1,000	272

REQUIRED:

- A. By allocating overhead based on direct labor hours, calculate the
 1. total budgeted cost of the Manufacturing Department.
 2. unit standard cost of Tuff Stuff.
 3. unit standard cost of Ruff Stuff.

- B. After separation of overhead into activity pools, compute the total budgeted cost of the
 1. Fabricating Department.
 2. Assembly Department.

- C. Using activity-based costing, calculate the unit standard costs for
 1. Tuff Stuff.
 2. Ruff Stuff.

- D. Discuss how a decision by Alyssa Manufacturing regarding the continued production of Ruff Stuff will be affected by the results of your calculations in Requirement C.

- CSO: B.1.d. Use of standard cost systems
 LOS: B.1.j. Demonstrate an understanding of the use of standard costs
 CSO: C.3.b. Plant-wide versus departmental overhead
 LOS: C.3.g. Calculate the per unit variable overhead expense
 CSO: C.2.c. Activity-based costing
 LOS: C.2.h. Calculate product cost using an activity-based system and compare and analyze the results with costs calculated using a traditional system

Question 1.8 – Lawton Industries

For many years, Lawton Industries has manufactured prefabricated houses where the houses are constructed in sections to be assembled on customers' lots. The company expanded into the pre-cut housing market in 2006 when it acquired Presser Company, one of its suppliers. In this market, various types of lumber are pre-cut into the appropriate lengths, banded into packages, and shipped to customers' lots for assembly. Lawton decided to maintain Presser's separate identity and, thus, established the Presser Division as an investment center of Lawton.

Lawton uses return on average investment (ROI) as a performance measure the investment defined as operating assets employed. Management bonuses are based in part on ROI. All investments in operating assets are expected to earn a minimum return of 15% before income taxes. Presser's ROI has ranged from 19.3% to 22.1% since it was acquired in 2006. The division had an investment opportunity in the year just ended that had an estimated ROI of 18% but Presser's management decided against the investment because it believed the investment would decrease the division's overall ROI.

Presser's operating statement for the year just ended is presented below. The division's operating assets employed were \$12,800,000 at the end of the year, a 5% increase over the balance at the end of the previous year.

Presser Division Operating Statement
For the Year Ended December 31
(\$000 omitted)

Sales revenue		\$24,000
Cost of goods sold		<u>15,800</u>
Gross profit		\$ 8,200
Operating expenses		
Administrative	\$2,140	
Selling	<u>3,600</u>	<u>5,740</u>
Income from operations before income taxes		<u>\$ 2,460</u>

REQUIRED:

- A. Calculate the following performance measures for the year just ended for the Presser Division of Lawton Industries.
 1. Return on average investment in operating assets employed (ROI).
 2. Residual income calculated on the basis of average operating assets employed.

- B. Would the management of Presser Division have been more likely to accept the investment opportunity it had during the year if residual income were used as a performance measure instead of ROI? Explain your answer.

- C. The Presser Division is a separate investment center with Lawton Industries. Identify and describe the items Presser must control if it is to be evaluated fairly by either the ROI or residual income performance measures.

CSO: B.3.d/e Return on investment/Residual income

LOS: B.3.e. Calculate return on investment

LOS: B.3.g. Calculate residual income

LOS: B.3.i. Compare and contrast ROI and RI as measures of performance

CMA Part 2 Essay Practice Questions

(Answers begin on Page 35)

Question 2.1 – Cambridge Automotive

Cambridge Automotive Products (CAP) Inc., a multinational corporation, is a major supplier of a broad range of components to the worldwide automobile and light truck market. CAP is in the process of developing a bid to supply an ignition system module to Korea Auto Corporation (KAC), a South Korean automobile manufacturer, for a new line of automobiles for the next four-year production cycle. The Request for Proposal issued by KAC specifies a quantity of 200,000 modules in the first year and 250,000 units in years 2 through 4 of the contract. CAP marketing specialists believe that, in order to be competitive, a bid of 100,000 South Korean Won (KRW) per unit is appropriate. Other relevant data are shown below.

- Manufacturing specialists estimate that a \$12 million (U.S. Dollars) investment in equipment (including installation) is required.
- The equipment is expected to last the 4-year life of the contract, at which time it would cost \$1.4 million to remove the equipment which would be sold for a scrap value of \$900,000.
- Direct labor and material expenses are estimated at \$40 per unit.
- The change in indirect cash expenses associated with this contract is expected to be \$3 million per year.
- The new product will require additional investment in inventory and accounts receivable balances at the outset, amounting to \$1.2 million during the four-year time period. This investment will be recovered at the end of the four-year contract.
- CAP is subject to U.S. income tax at an effective rate of 40%.
- For tax purposes, assume that the initial \$12 million cost of the equipment is depreciated evenly over the four-year period.
- The company economist estimates that the exchange rate will average 1,250 KRW per U.S. Dollar for the four-year time period.

REQUIRED:

A. Calculate the after-tax incremental cash flows in U.S. Dollars for the following periods:

1. Period 0.
2. Period 1.
3. Period 4 operating cash flow
4. Period 4 terminal cash flow.

B. The assumptions used to develop the cash flows are subject to various degrees of estimation error. For each of three different cash flow variables, identify and discuss one potential risk that could affect the estimates made by CAP.

CSO: D.1.b Incremental cash flows

LSO: D.1.b. Identify and calculate the relevant cash flows of a capital investment project on both a pretax and after-tax basis

CSO: D.5. Risk analysis in capital investment

LSO: D.5.1. Identify alternative approaches to dealing with risk in capital budgeting

Question 2.2 – City of Blakston

The City of Blakston owns and operates a community swimming pool. The pool is open each year for 90 days during the summer months of June, July, and August. A daily admission is charged to patrons of the pool. By law, 10% of all recreational and sporting fees must be remitted to a state tourism promotion fund. The City Manager has set a goal that pool admission revenue, after subtracting the state fee and variable costs, must be sufficient to cover the fixed costs. Variable costs are assumed to be 15% of gross revenue. Fixed costs for the three-month period total \$33,000. The following budget for the pool has been prepared for the current year.

Adult admissions: 30 per day x 90 days x \$5.00	\$13,500
Student admissions: 120 per day x 90 days x \$2.50	<u>27,000</u>
Total revenue	40,500
State tourism fee	<u>4,050</u>
Net revenue	36,450
Variable costs	6,075
Fixed costs	<u>33,000</u>
Expected deficit	<u>\$ (2,625)</u>

The City Manager is trying to determine what admission mix is necessary to break even and what actions could be taken to eliminate the expected deficit.

REQUIRED:

- A. Given the anticipated mix of adult and student admissions, how many total admissions must the pool have in order to break even for the season?
- B. Regardless of the admissions mix, what is the highest number of admissions that would be necessary to break even for the season?
- C. Regardless of the admissions mix, what is the lowest number of admissions that would be necessary to break even for the season?
- D. The City Manager is considering several pricing strategies that could increase the admissions fees at the swimming pool. Define each of the pricing strategies listed below and discuss how each could help to eliminate the expected deficit.
 1. Product-mix pricing.
 2. Volume discount pricing.
 3. Penetration pricing.
 4. Off-peak pricing.

CSO: C.1.a. Breakeven analysis

LOS: C.1.h. Demonstrate an understanding of how changes in unit sales mix affect operating income in multiple-product situations

CSO: C.3.b. Setting prices

LOS: C.3.g. Identify techniques used to set prices based on understanding customers' perceptions of value, competitors' technologies, products and costs

Question 2.3 – Grubstake Mining

Grubstake Mining Ltd. (GML) owns and operates the Dusty Coal Mine, among its other business ventures. The Dusty Coal Mine is a strip mine that has been in operation for a number of years and is expected to operate for another 15 years. Environmental regulations require mine operators to reclaim the land and restore it to its original configuration and vegetation state once mining ceases. GML has been setting aside money for this purpose in an external trust fund managed by a major commercial bank, and the balance in the fund is currently \$3 million. Assume that income tax regulations currently allow both the deposits to the trust fund and the earnings on the funds to be exempt from taxation.

GML would like to establish a uniform charge per ton for reclamation costs to be included in contracts with customers for future sales. It is estimated that the reclamation cost in today's dollars is \$14 million, and that amount is expected to increase by 4% per year. The trust fund is expected to earn income at a rate of 7% per year on its investments. Annual sales from the mine are expected to be 1,350,000 tons per year over the next 15 years.

REQUIRED:

- A. Calculate the cost per ton that GML should include in its contracts in order to accumulate a sufficient amount in the trust fund to be able to pay the cost to reclaim the land at the end of the 15-year period.
- B. Identify and discuss four uncertainties that GML faces over the 15-year period as far as reclamation is concerned. For each uncertainty, describe what the effect would be on the reclamation cost per ton.
- C. Without performing any calculations, discuss the effect on GML if the following changes were to be made in the tax regulations.
 1. Amounts collected for reclamation would be considered taxable income, even if they are deposited in external trust funds.
 2. Earnings on the trust funds are currently taxable.

CSO: C.2.a. Sunk costs, opportunity costs and other related concepts

LOS: C.2.d. Calculate relevant costs given a numerical scenario

CSO: C.4.a. Risk identification and exposure

LOS: C.4.a. Identify and explain the different types of risk, including hazard risks, financial risks, operational risks, and strategic risks

Question 2.4 – Kolobok Inc.

Kolobok Inc. produces premium ice cream in a variety of flavors. Over the past several years, the company has experienced rapid and continuous growth and is planning to increase manufacturing capacity by opening production facilities in new geographic areas. These initiatives have put pressure on management to better understand both their potential markets and associated costs. Kolobok’s management identified three aspects of their current operation that could affect the new market expansion decision: (1) a highly competitive ice cream market, (2) the company’s current marketing strategy, and (3) the company’s current cost structure.

Since the company began operations in 1990, Kolobok has used the mark-up approach for establishing prices for six-gallon containers of ice cream. The product prices include the cost of materials and labor, a markup for profit and overhead cost (a standard \$20), and a market adjustment. The market adjustment is used to appropriately position a variety of products in the market. The goal is to price the products in the middle of comparable ice creams offered by competitors while maintaining high quality and high differentiation. Sales for 2007 based on Kolobok’s mark-up pricing are presented below by product.

<i>Product</i>	<i>Material & Labor</i>	<i>Markup</i>	<i>Market adjustment</i>	<i>Unit Price</i>	<i>Boxes sold</i>	<i>Total Materials & Labor</i>	<i>Total Sales</i>
Vanilla	\$29.00	\$20.00	\$1.00	\$50.00	10,200	\$295,800	\$510,000
Chocolate	28.00	20.00	7.00	55.00	12,500	350,000	687,500
Caramel	26.00	20.00	2.00	48.00	12,900	335,400	619,200
Raspberry	27.00	20.00	2.00	49.00	13,600	367,200	666,400
Total					49,200	\$1,348,400	\$2,483,100

For the year 2007, Kolobok’s before-tax return on sales was 7%. The company’s overhead expenses were \$500,000, selling expenses \$250,000, administrative expenses \$180,000, and interest expenses were \$30,000. Kolobok’s marginal tax rate is 30%.

Kolobok is considering replacing mark-up pricing with target costing and has prepared the table below to better compare the methods. Kolobok tries to appeal to the top 30% of the retail sales customers, including restaurants and cafes. In positioning Kolobok’s products, three dimensions are considered: price, quality, and product differentiation. Accordingly, there are three main competitors in the market as follows.

Competitor A – Low cost, low quality, high standardization

Competitor B – Average cost, moderate quality, average differentiation

Competitor C – High cost, high quality, high differentiation

<i>Product</i>	<i>Competitor A Pricing</i>	<i>Competitor B Pricing</i>	<i>Competitor C Pricing</i>	<i>Kolobok Target Prices</i>
Vanilla	\$49	\$55	\$55	\$53
Chocolate	50	53	56	53
Caramel			51	50
Raspberry		51	52	50

Kolobok has also been reviewing its purchasing, manufacturing, and distribution processes. Assuming that sales volumes will not be affected by the new target prices, the company believes that improvements will yield a \$125,000 decrease in labor expense and a 25% reduction in overhead expense.

REQUIRED:

- A. Describe target costing.
- B. Analyze and compare the two alternative pricing methods: mark-up pricing and target costing.
- C. Assuming that the sales volumes will not be affected by the new product pricing based on target costing and that the process improvements will be implemented, calculate Kolobok's before-tax return on sales using the proposed target prices.
- D. Recommend which pricing method (mark-up or target) Kolobok should use in the future and explain why.

- CSO: C.3.b. Setting prices
- LOS: C.3.b. Differentiate between a cost-based approach and a market-based approach to setting prices
- CSO: C.3.c. Target costing
- LOS: C.3.c. Calculate selling price using a cost-based approach
- C.3.j. Calculate the target operating income per unit and target cost per unit
- C.3.r. Evaluate and recommend pricing strategies under specific market conditions

Question 2.5 – Langley Industries

Langley Industries plans to acquire new assets costing \$80 million during the coming year and is in the process of determining how to finance the acquisitions. The business plan for the coming year indicates that retained earnings of \$15 million will be available for new investments. As far as external financing is concerned, discussions with investment bankers indicate that market conditions for Langley securities should be as follows.

- Bonds with a coupon rate of 10% can be sold at par.
- Preferred stock with an annual dividend of 12% can be sold at par.
- Common stock can be sold to yield Langley \$58 per share.

The company's current capital structure, which is considered optimal, is as follows.

Long-term debt	\$175 million
Preferred stock	50 million
Common equity	275 million

Financial studies performed for Langley indicate that the cost of common equity is 16%. The company has a 40% marginal tax rate. (Ignore floatation costs for all calculations.)

REQUIRED:

- A. Determine how Langley should finance its \$80 million capital expenditure program, considering all sources of funds. Be sure to identify how many new shares of common stock will have to be sold. Show your calculations.
- B. Calculate Langley's weighted incremental cost of capital that it could use to assess the viability of investment options.
- C. Identify how each of the following events, considered individually, would affect Langley's cost of capital (increase, decrease, no change). No calculations are required.
 1. The corporate tax rate is increased.
 2. Banks indicate that lending rates will be increasing.
 3. Langley's Beta value is reduced due to investor perception of risk.
 4. The firm decides to significantly increase the percent of debt in its capital structure since debt is the lowest cost source of funds.

CSO: B.3.c. Debt management
LOS: B.3.d. Identify and evaluate debt issuance or refinancing strategies
CSO: B.3.d/e Common stock/Preferred stock
LOS: B.3.e. Value bonds, common stock, and preferred stock
CSO: B.4.d. Marginal cost of capital
LOS: B.4.c. Calculate the marginal cost of capital

Question 2.6 – Pearson Foods

Pearson Foods is the second largest company in the breakfast cereal and fruit juice markets. For the past five years, Pearson's profits have exceeded the industry average, and management has decided to pursue a plan for growth. Two promising opportunities are being evaluated.

- Pearson's first opportunity would be to enter the high energy, low-fat cereals market. This project would entail developing new products using new or expanded facilities and would be financed out of earnings and through a series of long-term debt offerings over the next two years. The debt offerings would raise Pearson's debt as a percent of total capital from 22% to 30% at the end of the two-year period.
- The second opportunity would be to acquire Safin Bakery, a long established and well known bread and bakery goods company. The acquisition could be completed by the end of the calendar year and would be financed by cash and long-term notes. The debt as a percent of total capital would rise to 40% by the end of the calendar year. Safin Bakery would be merged into Pearson Foods but operate independently as a separate division for two years. At the end of two years, Pearson would be able to consolidate the administrative, financial, and operating functions.

Both projects meet the investment criteria established by Pearson's management, and the Treasurer will be preparing an evaluation of the two projects in terms of the financing differences, the impact on profitability, and the operational and managerial problems.

REQUIRED:

- A. As part of a risk assessment process, identify the strategic advantages and disadvantages of Pearson Foods' opportunity to use internal expansion by developing new products for the high energy, low-fat cereals market.
- B. As part of a risk assessment process, identify the strategic advantages and disadvantages of Pearson Foods' opportunity to use external expansion by acquiring Safin Bakery.

CSO: C.4.a. Risk identification and exposure

LOS: C.4.a. Identify and explain the different types of risk, including hazard risks, financial risks, operational risks, and strategic risks

Question 2.7 – Sentech Scientific

Sentech Scientific Inc., a manufacturer of test instruments, is in contract negotiations with the labor union that represents its hourly manufacturing employees. Negotiations have reached an impasse, and it appears that a strike is imminent. The controller has called the general accounting manager into his office to discuss liquidity issues if and when a strike does occur.

The controller asks the accounting manager to recommend measures to assess liquidity if a strike were to occur. Although some of the nonunion employees could probably produce test instruments during a strike, the controller would rather be conservative and assume no shipments during this time frame. Since the customers may go to other sources to obtain the products they need during a strike, cash receipts for current outstanding amounts owed by customers may not be paid on a timely basis.

REQUIRED:

- A. Define liquidity and explain its importance to Sentech.
- B. Identify three measures that could be used to assess liquidity and explain how to calculate these measures.
- C. Determine which liquidity measure identified above would **best** fit the controller's requirements, and explain why. Include in your discussion the reasons why the other measures would not be as appropriate.

CSO: A.2.a. Liquidity

LOS: A.2.b. Analyze working capital by calculating the current ratio, the quick (acid test) ratio, the cash ratio, the cash flow ratio, and the net working capital ratio

A.2.z. Evaluate the performance of an entity based on multiple ratios

Question 2.8 – Ultra Comp

Ultra Comp is a large information technology firm with several facilities. The firm's Audit Committee has determined that management must implement more effective security measures at its facilities. A Security Improvement Team has been formed to formulate a solution. Janet Lynch is the financial analyst assigned to the team. She has determined that a six-year time horizon is appropriate for the analysis and that a 14% cost of capital is applicable. The team is investigating the following three vendors.

- Vendor A is a new entrant to the security industry and is in the process of introducing its security system which utilizes new technology. The system would require an initial investment of \$4 million and have a life of six years. A net cash outflow of \$500,000 per year for salaries, operation, maintenance, and all costs related to the system would also be required.
- Vendor B is an established firm in the security industry and has a security system that has been on the market for several years. The system requires an initial investment of \$1 million and will have a useful life of three years. At the end of the three-year period, Ultra Comp would have to replace the hardware at an estimated cost of \$1,250,000, based on current technology. A net cash outflow of \$750,000 per year for salaries, operation, maintenance, and all other related costs would also be required.
- Vendor C is a nationally recognized firm in the security industry and has proposed to Ultra Comp that it provide a total security solution. Vendor C would provide all hardware and personnel to operate and maintain a security system as called for by the specifications of Ultra Comp for all its locations. Ultra Comp would be required to sign a six-year contract at a cost of \$1,400,000 per year.

REQUIRED:

- A. Ultra Comp utilizes the Net Present Value (NPV) method to quantify the financial aspects of corporate decisions. Calculate the NPV of each of the three alternatives.
- B. Based on financial considerations, which of the three alternatives should the team recommend? Explain why.
- C. Define sensitivity analysis and discuss how Ultra Comp could use this technique in analyzing the three vendor alternatives.
- D. Identify and briefly discuss three non-financial considerations that the Ultra Comp team should consider prior to making a recommendation to senior management.

CSO: D.2.a. Net present value

LOS: D.2.b/g Calculate NPV and IRR/Evaluate and recommend project investments on the basis of DCF analysis

CSO: D.5.a. Sensitivity analysis

LOS: D.5.c. Distinguish among sensitivity analysis, scenario analysis, etc. as risk analysis techniques

CSO: D.1.a. Stages of capital budgeting

LOS: D.1.h. Identify and discuss qualitative considerations involved in the capital budgeting decision

Answers to Part 1 Practice Questions

Question 1.1 - Brawn Technology, Inc.

- A. The two fundamental types of internal audits are operational audits and compliance audits.

An operational audit is a comprehensive review of the varied functions within an enterprise to appraise the efficiency and economy of operations and the effectiveness with which those functions achieve their objective. An example would be an audit to assess productivity. Other examples could include an evaluation of processes to reduce rework, or reduce the time required to process paperwork or goods.

A compliance audit is the review of both financial and operating controls to see how they conform to established laws, standards, regulations, and procedures. An environmental audit would be an example of a compliance audit. Other examples of compliance audits could include the review of controls over industrial wastes or the review of procedures ensuring that proper disclosure is made regarding hazardous materials on site.

- B. 1. A compliance audit would best fit the requirements of the president of Brawn.
2. The objective of this compliance audit is to assure the president that the manufacturing facility has appropriate policies and procedures in place for obtaining the needed permits, has obtained all the required permits in accordance with the law, and that environmental and safety issues are being properly addressed.
3. The assignment specifically is to address the proper use of permits, compliance with safety regulations, and compliance with environmental standards. These issues can only be properly addressed by conducting a compliance audit. Although financial and operational areas might be involved, they would be secondary to the compliance issues. For example, a financial impact could result from the evaluation of compliance with safety regulations. The findings might result in additional expenditures for safety precautions or a reduction in the company's risk of being fined for lack of compliance.
- C. To mitigate the president's concern, the following activities and procedures could be implemented.
- Set the tone at the top. The president should communicate to all employees that the company expects appropriate business practices on the part of all employees in all divisions.

- Ensure that all employees have the necessary information to perform their duties. Keep the lines of communication open. For example, involve senior managers from the manufacturing facility in monthly operational meetings for the whole company.
- Conduct regularly scheduled audits of compliance with applicable laws, regulations, and standards.
- Periodically review and update policies, rules, and procedures to ensure that internal controls prevent or help to detect material risks. Make sure all employees have access to the relevant policies and procedures. For example, post the policies and procedures on the company's intranet.

Question 1.2 - Carroll Mining and Manufacturing

- A. The standards from IMA's Statement of Ethical Professional Practice that specifically relate to Alex Raminov and the situation at Carroll Mining and Manufacturing are the following.

Competence

Perform professional duties in accordance with relevant laws, regulations, and technical standards. It appears that CMMC is not in compliance with the relevant laws and regulations regarding the dumping of toxic materials; at a minimum, Raminov has an obligation to report this situation to higher authorities in the company.

Confidentially

Keep information confidential except when disclosure is authorized or legally required. This standard may or may not relate to the CMMC situation depending on the requirements of the environmental regulations in effect in the jurisdiction where CMMC is operating. Raminov may be required by law to disclose the information.

Integrity

Refrain from engaging in any conduct that would prejudice carrying out duties ethically.

Abstain from engaging in or supporting any activity that might discredit the profession.

If Raminov does not report the apparent illegal dumping to those in authority at CMMC, his behavior would not be considered ethical under these standards and his lack of action would discredit the profession.

Credibility

Communicate information fairly and objectively.

Disclose all relevant information that could reasonably be expected to influence an intended user's understanding of the reports, analyses, or recommendations.

Disclose delays or deficiencies in information, timeliness, processing, or internal controls in conformance with organization policy and/or applicable law.

All of these standards make it clear that Raminov has an obligation to act objectively in this matter and report the situation to those in authority at CMMC. The risks and exposures of illegal dumping should be disclosed in the financial reports that Raminov is preparing.

- B. Initially, Raminov should follow CMMC's policy regarding the resolution of an ethical conflict. If there is no policy or the policy does not resolve the issue, he should consider the courses of action recommended in IMA's Statement of Ethical Professional Practice.

Since Raminov's immediate supervisor appears to be involved in the dumping situation, he should submit the issue to the next higher level. If the situation is not satisfactorily resolved, Raminov should approach successive levels of authority, e.g., CFO, audit committee, Board of Directors. He can also contact an IMA ethics counselor or other impartial advisor to discuss possible courses of action. Raminov should consult an attorney regarding his legal obligations and rights in this ethical conflict.

- C. It is not considered appropriate for Raminov to inform authorities or individuals not employed or engaged by CMMC unless he believes there is a clear violation of the law. In discussions with his attorney, Raminov should clarify his obligations under the law. If CMMC does not take action after Raminov has informed the appropriate in-house authorities, he may be obligated to inform the regulatory agency involved. He should not under any circumstances anonymously release this information to the local newspaper.

Question 1.3 - Hi-Quality Productions

- A. The standards from IMA's Statement of Ethical Professional Practice that specifically relate to Amy Kimbell and the situation at Hi-quality Productions are the following.

Competence

Provide decision support information and recommendations that are accurate, clear, concise, and timely.

Recognize and communicate professional limitations or other constraints that would preclude responsible judgment or successful performance of an activity.

Amy Kimbell has an ethical conflict because she has been told to "keep quiet" about errors she has discovered in the original budgeting process. The incorrect data used makes the decision support data provided suspect and the decisions made based on that data risky.

Integrity

Refrain from engaging in any conduct that would prejudice carrying out duties ethically.

Abstain from engaging in or supporting any activity that might discredit the profession.

Amy Kimbell has an ethical conflict as she has an obligation to disclose the errors in the budgets presented but has been told not to. If she does not correct the situation, she will not be carrying out her duties ethically and therefore will discredit her profession.

Credibility

Communicate information fairly and objectively.

Disclose all relevant information could reasonably be expected to influence an intended user's understanding of the reports, analyses, or recommendations.

It is clear that the budget committee has not been objective in its presentation of information and therefore has distorted the decisions based on that information. Kimbell should correct the information so that future expectations are realistic.

- B. Initially, Kimbell should follow Hi-Quality Productions' policy regarding the resolution of an ethical conflict. If there is no policy or the policy does not resolve

the issue, she should consider the courses of action recommended in IMA's Statement of Ethical Professional Practice.

Kimbell should present her findings to her immediate supervisor. If her immediate supervisor is involved in the incorrect budgeting situation or if the supervisor takes not action, she should submit the issue to the next higher level. If the situation is not satisfactorily resolved, Kimbell should approach successive levels of authority, e.g., CFO, audit committee, Board of Directors. She can also contact an IMA ethics counselor or other impartial advisor to discuss possible courses of action. Kimbell should consult an attorney regarding her legal obligations and rights in this ethical conflict.

Question 1.4 – Matchpoint Racquet Club

A. MRC Cash Budget Proposed
Third Quarter (only)

Beginning cash balance	\$186,000
Third quarter cash receipts	200,650
Third quarter cash expenditures	<u>178,000</u>
Ending cash balance	<u>\$208,650</u>

Supporting calculations

Cash Receipts

Memberships	Fee	Distribution		
Individual	\$300	60%	\$36,000	(50 new+150 renewals) x .60 x \$300
Student	180	10%	3,600	(50+150) x .10 x \$180
Family	600	30%	<u>36,000</u>	(50+150) x .30 x \$600
Total			\$ 75,600	

Court Fees

Individual	\$50	60%	66,000	(50 new +2,000 regular) x .60 x \$50
Student	40	10%	8,800	2,050 x .10 x \$40
Family	90	30%	<u>59,400</u>	2,050 x .30 x \$90
Total			<u>134,200</u>	

Total Cash Receipts \$200,650

Cash Expenditures

Fixed costs	\$157,500	
Less depreciation	24,500	
Variable costs	<u>45,000</u>	(1000 hours+2000 hours) x \$15
Total Costs	<u>\$178,000</u>	

B. Sensitivity analysis would help MRC management by testing the assumed projections and seeing how sensitive the cash flows are to changes in the number of members or the distribution of members.

C. Other factors that MRC should consider include:

- Communication strategy to current members.
- Market acceptance of the new pricing strategy.
- Cost associated with the change.
- Timing of the change.
- The effect on the mix of membership class.
- The anticipated rate of return for excess cash and the costs of borrowing funds.
- The reliability of the projections.
- The capacity of the tennis and racquet ball courts.
- Price elasticity for memberships in similar clubs.
- The reaction of the competition.
- Quality of its facilities and staff.
- Cost of advertising/communicating this price change.

Question 1.5 - TruJeans

- A. The sales staff has not presented the controller with a unique expected level of sales, but rather sales numbers under various scenarios. The controller could use the expected sales in the budget, which is the summation of the anticipated sales under each scenario times the probability of that scenario. The controller would need to estimate the probability of each scenario in order to complete the task.
- B. Under direct costing, fixed manufacturing costs are expensed rather than being added to the inventoriable cost of each unit. Thus, it is not necessary to determine the allocation of fixed costs to individual units.
- C. At first glance, job order costing appears to make more sense, as each pair of jeans is literally unique, given that the buyer’s name is stitched on the back pocket. However, in reality, process costing should be used, because jeans will be produced continually, and for cost purposes, will be same for each pair.

Question 1.6 – Sonimad Sawmill

A.1. Relative sales value method at split-off

<u>Product</u>	<u>Monthly Output</u>	<u>Sales Price</u>	<u>Split-off Value</u>	<u>% of Sales</u>	<u>Allocated Costs</u>
Studs	75,000	\$ 8	\$ 600,000	46.15%	\$ 461,539
Decorative pieces	5,000	60	300,000	23.08%	230,769
Posts	20,000	20	400,000	30.77%	307,692
Totals			<u>\$1,300,000</u>	<u>100.00%</u>	<u>\$1,000,000</u>

A.2. Physical output (volume) method at split-off

<u>Product</u>	<u>Monthly Output</u>	<u>% of Output</u>	<u>Allocated Costs</u>
Studs	75,000	75.00%	\$ 750,000
Decorative pieces	5,000	5.00%	50,000
Posts	<u>20,000</u>	<u>20.00%</u>	<u>200,000</u>
Totals	<u>100,000</u>	<u>100.00%</u>	<u>\$1,000,000</u>

A.3. Estimated net realizable value method

<u>Product</u>	<u>Monthly Output</u>	<u>Sales Price</u>	<u>Net Value</u>	<u>% of Net Value</u>	<u>Allocated Costs</u>
Studs	75,000	\$ 8	\$ 600,000	44.44%	\$ 444,445
Decorative pieces	4,500 ¹	100	350,000 ²	25.93%	259,259
Posts	20,000	20	<u>400,000</u>	<u>29.63%</u>	<u>296,296</u>
Totals			<u>\$1,350,000</u>	<u>100.00%</u>	<u>\$1,000,000</u>

Notes:

(1) 5,000 monthly units of output – 10% normal spoilage = 4,500 good units

(2) 4,500 good units x \$100 = \$450,000 – further processing costs of \$100,000 = \$350,000

B. Presented below is an analysis for Sonimad Sawmill comparing the processing of decorative pieces further versus selling the rough-cut product immediately at split-off. Based on this analysis, it is recommended that Sonimad further process the decorative pieces as this action results in an additional contribution of \$50,000.

	<u>Units</u>	<u>Dollars</u>
Monthly unit output	5,000	
Less normal further processing shrinkage	<u>500</u>	
Units available for sale	<u>4,500</u>	
Final sales value (4,500 units @\$100 each)		\$450,000
Less sales value at split-off		<u>300,000</u>
Differential revenue		150,000
Less further processing costs		<u>100,000</u>
Additional contribution from further processing		<u>\$ 50,000</u>

Question 1.7 – Alyssa Manufacturing

A.1. The total budgeted costs for the Manufacturing Department at Alyssa Manufacturing are presented below.

Direct material		
Tuff Stuff (\$5.00/unit x 20,000 units)	\$100,000	
Ruff Stuff (\$3.00/unit x 20,000 units)	<u>60,000</u>	
Total direct material		\$ 160,000
Direct labor		800,000
Overhead		
Indirect labor	\$ 24,000	
Fringe benefits	5,000	
Indirect material	31,000	
Power	180,000	
Set-up	75,000	
Quality assurance	10,000	
Other utilities	10,000	
Depreciation	<u>15,000</u>	
Total overhead		<u>350,000</u>
Total budgeted cost		<u>\$1,310,000</u>

A.2&3 The unit standard costs of Tuff Stuff and Ruff Stuff, with overhead allocated based on direct labor hours, are calculated as follows.

Tuff Stuff

Direct material	\$ 5.00
Direct labor (\$8.00/hour x 2 hours)*	16.00
Overhead (\$3.50/hour x 2 hours)*	7.00
Tuff Stuff unit standard cost	\$28.00

Ruff Stuff

Direct material	\$ 3.00
Direct labor (\$8.00/hour x 3 hours)*	24.00
Overhead (\$3.50/hour x 3 hours)*	10.50
Ruff Stuff unit standard cost	\$37.50

*Budgeted direct labor hours

Tuff Stuff (20,000 units x 2 hours)	40,000
Ruff Stuff (20,000 units x 3 hours)	60,000
Total budgeted direct labor hours	100,000

Direct labor rate: $\$800,000 \div 100,000 \text{ hours} = \$8.00/\text{hour}$

Overhead rate: $\$350,000 \div 100,000 \text{ hours} = \$3.50/\text{hour}$

B.1&2 The total budgeted cost of the Fabricating and Assembly Departments, after separation of overhead into the activity pools, is calculated as follows.

	<u>Total</u>	<u>Fabricating</u>		<u>Assembly</u>	
		<u>Percent</u>	<u>Dollars</u>	<u>Percent</u>	<u>Dollars</u>
Direct material	\$ 160,000	100%	\$160,000		
Direct labor	800,000	75%	600,000	25%	\$200,000
Overhead					
Indirect labor	24,000	75%	18,000	25%	6,000
Fringe benefits	5,000	80%	4,000	20%	1,000
Indirect material	31,000		20,000		11,000
Power	180,000		160,000		20,000
Set-up	75,000		5,000		70,000
Quality assurance	10,000	80%	8,000	20%	2,000
Other utilities	10,000	50%	5,000	50%	5,000
Depreciation	<u>15,000</u>	80%	<u>12,000</u>	20%	<u>3,000</u>
Total overhead	<u>350,000</u>		<u>232,000</u>		<u>118,000</u>
Total budget	<u>\$1,310,000</u>		<u>\$992,000</u>		<u>\$318,000</u>

C. 1&2 The unit standard costs of the products using activity-based costing are calculated below.

Fabricating Department

Total cost	\$992,000
Less: Direct material	160,000
Less: Direct labor	600,000
Pool overhead cost for allocation	\$232,000
Hours: Tuff Stuff (4.4 Hrs. x 20,000 units)	88,000
Ruff Stuff (6.0 Hrs. x 20,000 units)	120,000
Total machine hours	208,000

Overhead cost/machine hour: $\$232,000 \div 208,000 = \$1.1154/\text{hour}$

Fabrication cost per unit: Tuff Stuff $\$1.1154 \times 4.4 \text{ hrs.} = \4.91 per unit
Ruff Stuff $\$1.1154 \times 6.0 \text{ hrs.} = \6.69 per unit

Assembly Department

Total cost – Direct labor = Pool overhead cost for allocation
 $\$318,000 - \$200,000 = \$118,000$

Set-ups = 1,000 (Tuff Stuff) + 272 (Ruff Stuff) = 1,272

Cost per set-up: $\$118,000 \div 1,272 = \92.77 per set-up

Set-up cost per unit:

Tuff Stuff: $(\$92.77 \times 1,000) \div 20,000 \text{ units} = \4.64 per unit
Ruff Stuff: $(\$92.77 \times 272) \div 20,000 \text{ units} = \1.26 per unit

Tuff Stuff Standard Activity-based Cost

Direct material	\$ 5.00
Direct labor	16.00
Fabrication Department overhead allocation	4.91
Assembly Department overhead allocation	<u>4.64</u>
Total cost	<u>\$30.55</u>

Ruff Stuff Standard Activity-based Cost

Direct material	\$ 3.00
Direct labor	24.00
Fabrication Department overhead allocation	4.91
Assembly Department overhead allocation	<u>6.69</u>
Total cost	<u>\$34.95</u>

- D. When compared to the old standard cost (\$37.50), the new activity-based standard cost for Ruff Stuff (\$34.95) should lead the company to decide to lower the price for Ruff Stuff in order to be more competitive in the market and continue production of the product. Using ABC for allocating overhead costs generally leads to a more accurate estimate of the costs incurred to produce a product, and Alyssa should be able to make better informed decisions regarding pricing and production.

Question 1.8 - Lawton Industries

- A. Average investment in operating assets employed:

Balance end of current year	\$12,600,000
Balance end of previous year*	<u>12,000,000</u>
Total	<u>\$24,600,000</u>

Average operating assets employed** \$12,300,000

*\$12,600,000 ÷ 1.05

**\$24,600,000 ÷ 2

ROI = Income from operations ÷ Average operating assets employed
= \$2,460,000 ÷ \$12,300,000
= .20 or 20%

Residual Income:

Income from operations	\$2,460,000
Minimum return on assets employed*	1,845,000
Residual income	\$ 615,000

*\$12,300,000 x .15

- B. Yes, Presser's management probably would have accepted the investment if residual income were used. The investment opportunity would have lowered Presser's ROI because the expected return (18%) was lower than the division's historical returns as well as its actual ROI (20%) for the year just ended. Management rejected the investment because bonuses are based in part on the performance measure of ROI. If residual income were used as a performance measure (and as a basis for bonuses), management would accept any and all investments that would increase residual including the investment opportunity rejected in the year just ended.

- C. Presser must control all items related to profit (revenues and expenses) and investment if it is to be evaluated fairly as an investment center by either the ROI or residual income performance measures. Presser must control all elements of the business except the cost of invested capital, that being controlled by Lawton Industries.

Answers to Part 2 Practice Questions

Question 2.1 - Cambridge Automotive Products

A. The analysis shown below yields the following after-tax incremental cash flows:

1.	Period 0	(\$13,200,000)
2.	Period 1	4,200,000

\$ Millions

<u>Cash Flow Element</u>	<u>0</u>	<u>1</u>	<u>Year</u>		
			<u>2</u>	<u>3</u>	<u>4</u>
Revenue		\$16.0	\$20.0	\$20.0	\$20.0
Equipment	(\$12.0)				
Equipment Salvage					\$0.9
Equipment Removal					(\$1.4)
Direct Labor & Materials		(\$8.0)	(\$10.0)	(\$10.0)	(\$10.0)
Indirect Costs		(\$3.0)	(\$3.0)	(\$3.0)	(\$3.0)
Net Working Capital	(\$1.2)				\$1.2
Total Cash Flow Before Tax	(\$13.2)	\$5.0	\$7.0	\$7.0	\$7.7
Cash Taxes		(\$0.8)	(\$1.6)	(\$1.6)	(\$1.4)
Net Cash Flow, After Tax	(\$13.2)	\$4.2	\$5.4	\$5.4	\$6.3

Memo: Calculation of Cash Taxes

Tax Profit Before Tax & Depreciation	\$5.0	\$7.0	\$7.0	\$6.5
Tax Depreciation	(\$3.0)	(\$3.0)	(\$3.0)	(\$3.0)
Tax Profit Before Tax	\$2.0	\$4.0	\$4.0	\$3.5

3. The Period 4 operating cash flow is \$5,400,000 calculated as follows.

Revenue	\$20,000,000
Direct labor & material	(10,000,000)
Indirect costs	<u>(3,000,000)</u>
Before tax cash flow	7,000,000
Tax effect ¹	<u>(1,600,000)</u>
After tax cash flow	<u>\$ 5,400,000</u>

¹ \$7,000,000 - \$3,000,000 = \$4,000,000 x 40% = (\$1,600,000)

4. The Period 4 terminal cash flow is \$900,000 calculated as follows.

Equipment removal	(\$1,400,000)
Salvage	900,000
Working capital recovery	<u>1,200,000</u>
Before tax cash flow	700,000
Tax effect ²	<u>200,000</u>
After tax cash flow	<u>\$ 900,000</u>

² \$700,000 - \$1,200,000 = (\$500,000) x 40% = \$200,000

B. Cash flow variables with potential risks that could affect the estimates made by CAP include the following.

- Volume estimates are generally subject to a high degree of estimation error due to the variety of external factors that impact the volume realized in the future. Competitive forces, consumer acceptance of the new product, general economic conditions are just a few of the factors that could influence the ultimate demand realized for the new car by KAC, which would impact the demand for ignition system modules from CAP. Since there are a number of fixed costs, including equipment and indirect costs, deviations in volume could have a significant impact on the cash flows and the financial success of the project.
- Exchange rates are another important variable. Since CAP is a U.S. company with a cost structure consisting of U.S. dollar denominated expenses, there is exchange risk resulting from a revenue stream in the Korean Won. The net cash flows from the project in U.S. dollars will be dependent on the exchange rate in effect when each of the KRW denominated payments is received.
- Direct costs are another potential variance given that the actual productivity of its workforce, the reliability of its manufacturing systems, and unit materials costs could vary substantially from what CAP projects. In a competitive bidding situation, there may be pressure to bid as low as possible to increase the chances for success. If the firm has used “best case” assumptions for its cost structure, negative variances in the assumptions for direct costs could decrease the amount of cash flow generated from the project relative to expectations.
- The estimates for the cost of the equipment removal and the salvage value of the equipment could vary significantly as these costs will occur several years in the future and could negatively impact the expected cash flow.

Question 2.2 - City of Blakston

- A. The contribution margin is 75%¹ or \$3.75 per adult admission, and \$1.875 per student admission. The mix is 20% adult (30 ÷ 150) and 80% student (120 ÷ 150). The weighted average contribution margin is:

$$\text{WACM} = .20(\$3.75) + .80 (\$1.875) = \$2.25$$

The breakeven point is Fixed cost ÷ WACM

$$\$33,000 \div \$2.25 = \underline{14,667 \text{ per season.}}$$

¹ 100% - state fee of 10% - variable cost of 15%

- B. The highest number to break even assumes that all admissions are students:

$$\$33,000 \div \$1.875 = 17,600 \text{ per season}$$

- C. The lowest number to break even assumes that all admissions are at the adult rate:

$$\$33,000 \div \$3.75 = 8,800 \text{ per season}$$

- D.1. Under product-mix pricing, the price is set low for some products or segments in the hope that it will attract others. If it is found that adults are usually accompanied by students, attempts could be made to find the mix of adult/student prices that brings in the most patrons.
- D.2. Volume discount pricing could be used by allowing for discounts based on an individual patron's usage (e.g., season pass) or allowing for group discounts (e.g., clubs, church groups).
- D.3. Penetration pricing is the setting of a competitive price, in the hopes of beating the competition. Price could be set competitive (or lower) than other pools in the region, in an attempt to maximize contribution margin.
- D.4. Off-peak pricing is used to encourage purchases during slower periods. A discounted pricing could be set on days when volume is expected to be low (e.g., cloudy days) or during slower times of the day (e.g., evening admission).

Question 2.3 - Grubstake Mining Ltd.

A. The required cost per ton can be calculated as follows:

Required fund at the end of year 15

Amount in today's dollars	\$14,000,000
Future value factor (15 years, 4%)	<u>1.801</u>
Required fund	<u>\$25,214,000</u>

Value of current fund at the end of year 15

Current fund value	\$3,000,000
Future value factor (15 years, 7%)	<u>2.759</u>
Value in 15 years	<u>\$8,277,000</u>

Estimated additional amount needed in year 15

Required fund	\$25,214,000
Value of current fund in 15 years	<u>8,277,000</u>
Additional amount needed	<u>\$16,937,000</u>

Annual funding required

Additional amount needed	\$16,937,000
FV of Annuity factor (15 years, 7%)	<u>÷ 25.129</u>
Annual funding required	<u>\$ 674,002</u>

Cost per ton

Annual funding required	\$ 674,002
Annual output (Tons)	<u>÷ 1,350,000</u>
Cost per ton	<u>\$ 0.50</u>

B. Major uncertainties and their effect on the charge per ton could include the following.

- Estimate of the cost in today's dollars for the reclamation. Since the reclamation will not be done for 15 years, there is considerable uncertainty. The technology could change, resulting in higher or lower cost. The law or associated regulations could also change.
- Rate of escalation of the reclamation cost. Future cost increase levels are difficult to project.

- Estimated earnings level of the fund. The 15-year horizon is a long period of time. Investment returns from the equities and fixed income markets can fluctuate significantly from year to year.
- Tax regulations can change. This would affect the annual amount deposited to the fund because earnings could become taxable.
- The mine output could change. Total output could be different and/or the yearly amounts may not be uniform as projected.

C. Changes in tax regulations could affect the analysis in the following ways.

1. If amounts collected for reclamation and deposited in external funds were taxable,
 - GML would have to charge its customers more each year.
 - the charge per ton would initially be adjusted by dividing the amount by (1-tax rate) and offsetting that by an amount equal to the present value of the tax benefit in 15 years when reclamation occurs and a tax benefit is received.
2. If the earnings on the fund were taxable,
 - the charge per ton would have to increase to offset the tax payments.
 - GML may want to communicate to the trustee that it should be more aggressive (i.e., take more risk) so it earns higher pre-tax returns.
 - GML may want the trustee to invest in tax exempt instruments. This decision should take into account the yields of tax exempt vs. taxable instruments.

Question 2.4 - Kolobok

- A. Target costing is focused on market pricing or the prices of a firm's most direct competitors. The process for determining product pricing involves the following five steps: (1) determine the market price, (2) determine the desired profit, (3) calculate the target cost at market price less the desired profit, (4) use value engineering to identify ways to reduce product cost, and (5) use continuous improvement and operational controls to further reduce costs and increase profits.
- B. The main difference between the two methods of pricing is a different starting point for determining product price. Mark-up pricing is based on existing costs and a desired return. The price is then determined by adding the product cost and the desired mark-up. This method provides little incentive to reduce costs as long as sales are profitable.

Using target costing, product prices are determined by reviewing competitive pricing and setting prices according to market strategies and positioning. Target costing moves from the existing market prices to the process of managing the product costs in order to earn a desired return. Target costing motivates process improvements. The process is intended to increase or maintain sales while increasing product profitability by reducing product costs through the elimination of non-value added activities.

C. Calculate earnings before taxes:

Sales*	\$2,528,100	
Less material & labor	1,223,400	(1,348,400 – 125,000)
Less overhead	<u>375,000</u>	(500,000 x .75)
Contribution	929,700	
Selling expense	250,000	
Admin expense	180,000	
Interest expense	<u>30,000</u>	
Earnings before taxes	<u>\$ 469,700</u>	

* Vanilla	\$53 x 10,200	540,600
Chocolate	\$53 x 12,500	662,500
Caramel	\$50 x 12,900	645,000
Raspberry	\$50 x 13,600	680,000

D. The preferable pricing method for Kolobok is target costing as it is projected to significantly increase the return on sales from 7% to 18.5% ($\$469,700 \div \$2,528,100$) while maintaining the existing sales level. Target costing will also motivate management to improve internal processes to reduce costs to further improve profitability, particularly for any product where the proposed target price is lower than the previous price. This method will also force Kolobok to be continually aware of the actions of its competitors and trends in the marketplace in order to make adjustments when needed.

Question 2.5 - Langley Industries

A. Financing plan (dollars in millions):

	Current structure	Percent of total	Funds Needed	Retained earnings	External sources
Debt	\$175	35%	\$28		\$28
Preferred	50	10%	8		8
Common	275	55%	44	\$15	29
Totals	\$500	100%	\$80	\$15	\$65

Financing sources will be as follows:

New Debt	\$28 million
New Preferred stock	8 million
Retained earnings	15 million
New Common stock ¹	<u>29 million</u>
Total	<u>\$80 million</u>

¹ \$29 million ÷ \$58 per share = 500,000 new common shares

B. Weighted incremental cost of capital

	% of Capital Structure	Cost	Weighted Cost
Debt	35%	6.00% ¹	2.10%
Preferred	10%	12.00%	1.20%
Common	55%	16.00%	8.80%
Cost of Capital			12.10%

¹ Pre-tax 10% x (1- tax rate) = 6.00%

- C.1. If the corporate tax rate was increased, the after-tax cost of debt would be reduced, thereby reducing the cost of capital. In other words, the tax shield of debt becomes more valuable to the firm.
- C.2. When the banks indicate they are raising rates, the rest of the debt market generally raises rates. The higher cost of debt will increase the overall cost of capital.
- C.3. Beta is a measure of risk. According to the Capital Asset Pricing Model, the cost of equity is directly related to risk. As risk is reduced the cost of equity is reduced and correspondingly the overall cost of capital is reduced.
- C.4. In general, a significant increase in the percent of debt in the capital structure (especially in this case where the current structure is deemed optimal), results in more risk for the firm. This increases its cost of debt and its cost of equity. The increase in the cost of equity will most likely offset the fact that debt has a lower relative. The result here is that the cost of capital should increase.

Question 2.6 - Pearson Foods

A. The strategic advantages that Pearson Foods could realize by expanding internally through the development of new products for the low-fat, high-energy food market include the following.

- The new products complement the existing product line, creating operational efficiencies, and brand loyalty.
- The company would incur less debt than if it purchases another company.
- The company could capitalize on the low-fat diet trend.
- The company has management know-how in the industry.

The strategic disadvantages that Pearson Foods could realize by expanding internally through the development of new products for the low-fat high-energy food market include the following.

- New product development requires large outlays for research, new facilities, test marketing, etc.
- New product development decreases cash availability.
- The increased debt ratio could increase the firm's risk, and thus its stock price is at risk.
- The company would incur the risk of product failure.
- It takes a long time to develop a new product and realize profits.

B. The strategic advantages that Pearson Foods could realize by expanding externally through the acquisition of Safin Bakery include the following.

- The acquisition would result in immediate, quantifiable earnings and cash flows.
- The company would acquire a complete company with a proven track record and established markets.
- Managerial and technical expertise would already be in place.
- Safin's established distribution channels could provide new markets for Pearson's other products.
- The addition of Safin would diversify Pearson's product base.
- The acquisition could create synergies for both companies, accomplishing together what they could not do alone.
- Safin could create new growth possibilities for Pearson's employees.

The strategic disadvantages that Pearson Foods could realize by expanding externally through the acquisition of Safin Bakery include the following.

- In order to make the acquisition, the company would have to incur a large amount of debt, which could impair its financial flexibility, debt rating and stock price.
- Pearson lacks knowledge and experience with Safin's products.
- Safin would have to be integrated with Pearson in two years – including the computer system, the accounting system, and the culture.
- An independent operation could lead to suboptimal decisions.

Question 2.7 - Sentech Scientific Inc.

A. Liquidity is the ability of an asset to be converted into cash without significant price concessions. Liquidity is important to Sentech because current obligations will continue if there is a strike. Understanding the company's ability to meet its obligations even if normal cash receipts are not forthcoming would give management an indication of whether or not – and for how long – it could weather a strike. Lack of liquidity can limit a company's financial flexibility, making it unable to take advantage of discounts and other profitable opportunities. Liquidity problems can also lead to financial distress or bankruptcy.

B. Measures of liquidity include the following.

- Current ratio: $\text{current assets} / \text{current liabilities}$
- Quick ratio (or acid-test ratio): $(\text{cash} + \text{marketable securities} + \text{accounts receivable}) / \text{current liabilities}$. The quick ratio excludes inventory and prepaid expenses from cash resources.
- Cash ratio: $(\text{cash} + \text{marketable securities}) / \text{current liabilities}$
- Only cash and securities that are easily convertible into cash are used.
- Net working capital: $\text{current asset} - \text{current liabilities}$
- Net working capital ratio: $\text{net working capital} / \text{total assets}$
- Sales to working capital: $\text{sales} / \text{average net working capital}$
- Accounts receivable turnover: $\text{net sales} / \text{average gross receivables}$
- This ratio can also be calculated in days.
- Inventory turnover: $\text{cost of goods sold} / \text{average inventory}$
- This ratio can also be calculated in days.

C. Based on the parameters set down by the controller, either the quick ratio or the cash ratio would be best. The reason that these ratios are best is because they focus on the most liquid assets, excluding prepaid expenses and inventories. During a strike inventories would not be a source of cash. The cash ratio excludes receivables as well, and would be the most conservative measure. The cash ratio would reflect the fact that the collection of receivables would be slowed during a strike.

Question 2.8 - Ultra Comp

A. Net present value of each of the alternatives

	Time	Amount	14% PV Factor	Present Value
Vendor A				
Initial investment	0	\$4,000,000	1.000	\$4,000,000
Annual cash outflow	1-6	500,000	3.889	1,944,500
NPV				\$5,944,500
Vendor B				
Initial investment	0	\$1,000,000	1.000	\$1,000,000
Replacement	3	1,250,000	0.675	843,750
Annual cash outflow	1-6	750,000	3.889	2,916.750
NPV				\$4,760,500
Vendor C				
Annual cash outflow	1-6	\$1,400,000	3.889	5,444,600
NPV				\$5,444,600

B. Ultra Comp should select Vendor B. It is the optimal choice from a financial point of view as it meets the requirements at the lowest cost. Since the decision has already been made to implement a new security system, the issue is to decide on a system that meets the requirements at the lowest cost.

C. Sensitivity analysis is a tool to test the impact of changing investment assumptions on the resulting net present values. The method helps determine the “sensitivity” of outcomes to changes in the parameters. It shows how the output of the model depends on the input of the model.

D. Non-financial factors that Ultra Comp should consider prior to making a recommendation include the following.

- Vendor A technology may be more effective in the long term even though it is the highest cost solution. However, there is a risk involved in the fact that this is new technology and may not prove effective.
- Vendor B technology is known to be effective and should be satisfactory for the near term. However, there is uncertainty in the long term.
- Since Vendor C is a nationally recognized leader, it may be in a better position to manage the security of Ultra Comp, especially as new developments arise.
- Ultra Comp should review the management capability and the financial stability of each of the vendors.
- Ultra Comp should contact previous clients of each of the vendors to determine their level of satisfaction with the quality and customer service of each vendor.