Name____

ID#____________

Accounting 15. 501/516

Spring 2004

FINAL EXAM

Exam Guidelines

1. **Fill in your name above. Exams without names will not be graded. If you do not have an ID number, leave the corresponding space blank.**
2. **Place your name tags in front of you.**
3. **You are free to detach any of the pages during the exam. Please make sure you return pages 1 through 17, duly stapled, at the end of the exam.**
4. **You are allowed to refer to a single sheet of size A4 paper that you may have brought with you. You should not refer to sheets brought to the exam by other students. No other reference material is allowed in the exam.**
5. **The exam has to be completed in 180 minutes. The total number of points is 110. Budget your time wisely.**
6. **Work in a clear, readable manner. Ample space is provided for every answer.**
7. **Write answers in the space provided. Unreadable answers will not be graded.**
8. **Show computations for partial credit.**
9. **If you feel assumptions are necessary to answer a question, state all assumptions clearly.**
10. **Laptops and computers are prohibited. You may use calculators.**

Please do not fill in the following table.

Question	**Total points**	**Points lost**
PART A		
Question A1	43	
Question A2	7	
PART B	25	
PART C		
Question C1	19	
Question C2	16	
Total	**110**	

PART A **50 points**

Part A has two questions: A1 and A2. Use the financial statements of CMC Inc., a computer manufacturer based in Texas, to answer all questions in Part A. The financial statements are on pages 16 and 17 of this exam.

Question A1 ***43 points***

(a) What was the value of dividends, if any, paid by CMC in 2003? Show calculations.

2 points

RE_{2002} + Net $Income_{2003}$ – $Dividend_{2003}$ = RE_{2003}
1075 + 861 – $Dividend_{2003}$ = 1786
$Dividend_{2003}$ = 150

(b) What was the value of accounts receivables declared as confirmed defaults and written off in 2003? Show calculations. Assume there are no recoveries when accounts receivables are written off.

3 points

ADA_{BB} + Bad debt expense – write-offs = ADA_{EB}
494 + 75 – Write-offs = 526
Write-offs = 43

(c) 50% of total sales in 2003 were credit sales. What was the value of cash collection on credit sales in 2003? Show calculations. Assume there are no recoveries when accounts receivables are written off.

6 points

Credit sales in 2004 = 50% * 7,000 = 3,500

A/R_{BB} + Credit sales – Cash collection – Write-offs = A/R_{EB}
(1,801+494) + 3,500 – Cash collection – 43* = (2,103+526)
Cash collection = 3,123

* from (b).

(d) You look for the inventory footnote and find the following information: "Inventories are stated at lower of cost or market value. The last-in, first-out (LIFO) method is utilized for reporting inventories. If inventories had been valued using first in, first out (FIFO) method they would have been $302 and $569 higher than amounts reported using LIFO at fiscal year-end 2002 and 2003 respectively. During 2003, the company liquidated certain LIFO inventories that were carried at lower costs prevailing in prior years. The effect of this liquidation was to increase profit before income taxes by $ 141." What "Cost of Goods Sold" would CMC have reported if it had used FIFO? Show calculations.

3 points

$COGS_{LIFO} – COGS_{FIFO}$ = change in LIFO Reserve
$COGS_{FIFO} = COGS_{LIFO}$ - change in LIFO Reserve = 4,550 – (569-302) = 4,283

(e) Using the information in part (d), what was the difference in 2003 between "Cost of Goods Sold" under LIFO and that under FIFO that reflected solely an effect of changing prices? Show calculations.

4 points

$COGS_{LIFO}$ without liquidation – $COGS_{FIFO}$ = change in LIFO Reserve + LIFO liquidation
= (569 – 302) + 141 = 408

(f) In 2003, CMC spent $1,500 on new investments in PP&E. CMC's total depreciation expense in 2003 was $777. What was the book value of assets sold in 2003? Book value of assets is defined as the difference between historical cost of the asset and accumulated depreciation. Show calculations.

5 points

PPE_{BB} + Acquisition – Disposal = PPE_{EB}
7,406 +1,500 – Disposal = 8,156
Disposal = 750

$AccDep_{BB}$ + Depreciation expense – AccDep associated with disposal = $AccDep_{EB}$
3,864 + 777 - AccDep associated with disposal = 4,070
AccDep associated with disposal = 571

Net book value of assets sold in 2003 = 750 – 571 = 179

(g) Report the complete journal entry for recording the sale of assets in 2003 including the cash effect, the balance sheet effect and the income statement effect. Assume all assets sales happened in one transaction and were cash transactions.

6 points

Dr. Cash 309
  Accumulated Depreciation 571
  Cr. PPE 750
    Gain on Sale of Assets 130

(h) Over its entire life CMC has made a single zero-coupon bond issue. This bond was still outstanding at the end of 2003 (Net Bonds Payable of $2,985). On Jan 1st, 2004, CMC retired its bond early. The market interest rate on that date was 7% on these zero coupon bonds. Did CMC record a loss or a gain on retirement of bonds on Jan 1st, 2004? Justify your answer.

4 points

Interest Expense2003 = 2,985 – 2,738 = 247
Market interest rate of the zero-coupon bond at issuance = 247/1,738 = 9%

Current market interest rate = 7% < market interest rate at issuance 9%
→ Current market value > Book value
→ CMC recorded a gain on retirement of bonds.

(i) Assume CMC had only one lease contract outstanding in 2003 and 2002, and no plans to enter another lease contract. What is the effective lease interest rate? What is the value of the annual lease payment? Show calculations. [Hint: Use the information provided under both Current Liabilities and Long-Term Liabilities]

5+5 points

Let y = annual lease payment and r = effective lease interest rate

We can have two equations with two unknowns:
Y – 1,620 * r = 354
Y – (1,620 + 325) * r = 325

Solving these two equations, we have r = 8.9% and y = 500

Question A2 ***7 points***

Accruals are defined as the difference between net income after taxes (NI) and cash flow from operations (CFO). That is, Accruals = NI – CFO. For the following questions, please refer to the Income Statement of CMC.

(a) After the results for 2003 are published, the Chief Accountant at CMC discovers an error in CMC's income statement. "Gain on Sale of Assets" should have been reported as $230 instead of $130, as it was actually reported. [Important: ignore this information for Question A1]. Assume income taxes payable to the government are not affected by this error. Would the correct value of accruals be higher or lower than actually reported in the financial statements of 2003? Justify your answer.

3 points

The correct value of accruals will be higher than reported.

Gain on sale of assets is understated by $100, which means Net income is also understated by $100. There won't be any change on CFO since CFO = Net income – gain on sale of assets and both items are understated by the same amount. However, accruals = net income – CFO. When net income is understated, accruals are also understated.

(b) Your friend, a software programmer with no background in financial reporting asserts "Any difference in net income and CFO must be a result of accounting errors. If companies are following GAAP, accruals should be identically zero for all companies." Would you agree with your friend? Justify your answer.

4 points

No. GAAP has two basic rules:

1) Define revenues as earned, not realized in cash.
2) Define expenses using the matching principle. This leads to a mismatch between net income and cash flow from operations.

PART B **25 points**

Hunter Inc., an industrial chemicals manufacturer in Massachusetts, acquired shares of Sitting Duck Inc. which operates in a similar line of business in New Hampshire. The following events took place:

- Hunter acquired 10,000 shares of Sitting Duck for $10/share on Jan 1st 2002. Hunter classified this investment as AFS (Available For Sale).
- On December 31st, 2002, Sitting Duck was trading for $12.40/share. Hunter decided to hold on to its investment.
- On Jan 1st, 2003, with Sitting Duck still trading at $12.40/share, Hunter acquired another 15,000 shares of the former.
- Finally, on Jan 1st, 2004, Hunter acquired a further 41,000 shares of Sitting Duck for $15 per share.
- Hunter has never made any other equity or debt investment

To determine percentage ownership of Sitting Duck by Hunter, use the proportion of total Sitting Duck shares acquired by Hunter. Sitting Duck had a total of 100,000 shares outstanding through years 2002, 2003 and 2004.. Sitting Duck's net income and dividends for 2002 and 2003 are reported below:

	2002	**2003**
Net income	500,000	600,000
Dividends	100,000	120,000

In answering the questions below, ignore deferred taxes.

(a) Report the adjusting journal entry made by Hunter on Dec 31st, 2002, to record the gain or loss in value of its investment in Sitting Duck.

3 points

Gain in value = (12.4 – 10) *10,000 = 24,000

Dr. Marketable Securities 24,000
Cr. Other Equity 24,000

or Dr. Marketable Securities Adjustment Accounting 24,000
Cr. Other Equity 24,000

(b) Investment Income is the income that Hunter recognizes as a result of its investment in Sitting Duck. What is the Investment Income reported by Hunter in 2002?

2 points

Percentage acquired = 10%
Investment income = 10% of Sitting Duck's dividends in 2002 = 10,000

(c) How is Hunter's investment in Sitting Duck classified in 2003? What is the balance under "Investment in Sitting Duck" on Dec 31st , 2003?

2+5 points

Percentage acquired = 10% + 15% = 25%
Investment income = 25% of Sitting Duck's net income in 2003 = 150,000

(d) Investment Income is the income that Hunter recognizes as a result of its investment in Sitting Duck. What is the Investment Income recorded by Hunter in 2003? Show calculations.

3 points

On Jan.1, 2003, the entire investment of 25% in Sitting Duck is classified as Long Term Investment.

Investment in Sitting Duck on Dec.31, 2003
= 12.4 * 25,000 shares + 25% * 600,000 – 25%* 20,000
= 310k + 150k – 30k
= 430k

(e) As a shareholder of Hunter, you are analyzing Hunter's audited Balance sheet for Year 2004. What balance would you see under "Investments in Sitting Duck" at the end of 2004? Provide reasons/calculations for your answer.

2 points

Zero balance in "Investment in Sitting Duck" since Sitting Duck is consolidated in 2004.
Total percentage of shares acquired in 2004 = 66%

(f) Assume Hunter's complete acquisition of Sitting Duck in 2004 resulted in goodwill of $200,000. How is goodwill defined? What does the value of goodwill represent in an acquisition?

2+1 points

Goodwill = Price paid for the target – Fair value of the target's net assets

Goodwill represents the value of synergies expected from the merger.

(g) What are some of the problems that arise in the implementation of recommended procedures for goodwill impairment testing?

5 points

1) It requires the analysts to value the unlisted business units.
2) Analysts typically write off goodwill following stock price declines. Therefore goodwill impairment is not incrementally informative.
3) Analysts ignore goodwill impairment charge. Managers have an incentive to take big baths through these charges.

PART C **35 points**

Question C1 ***19 points***

Tyson Petrochemicals Inc. buys barrels of crude petroleum and further processes them to extract gasoline, engine oil and paraffin. A single barrel contains 50 gallons of crude petroleum, usually referred to simply as "crude". Each barrel of crude can be further processed to yield 30 gallons of gasoline, 10 gallons of engine oil and 10 gallons of paraffin. Tyson has to incur further processing costs of $45.00 to sell the gasoline it extracts from a single barrel of crude. Similarly, Tyson incurs further processing costs of $10.00 and $2.00 before it can sell the engine oil and paraffin, respectively, that is extracted from a barrel of crude. The gasoline extracted from a barrel sells for $60.00, the engine oil sells for $15.00 and the paraffin sells for $5.00.

Tyson follows a system of allocating the cost of a single barrel of crude to each of its three product lines by proportion of total volume by barrel. Tyson's CFO thinks this is a perfectly reasonable and natural allocation scheme. Recently, prices of crude have risen to $20.00 per barrel and the CFO is worried that at least one of her products will not be profitable after the price rise.

(a) What is the cost of crude allocated to each product line under the existing allocation scheme? Show calculations.

6 points

Answer:

Tyson will allocate the cost of $20 to each of the products on the basis of volume.

	Gas	**Engine Oil**	**Paraffin**	**Total**
Volume	30	10	10	50
-Volume%	*30/50*	*10/50*	*10/50*	
-Volume%	*60%*	*20%*	*20%*	
-Allocation Formula for $20 Based on Volume	*(60%)*20*	*(20%)*20*	*(20%)*20*	
Allocation of $20	**12**	**4**	**4**	20

(b) What is the net profit made by each product line after allocation of the cost of crude, using the current allocation scheme?

3 points

Answer:

Tyson calculates net profit as follows:

	Gas	Engine Oil	Paraffin	Total
Price	60	15	5	
-Processing Costs	-45	-10	-2	
-Allocation of $20 (from above)	-12	-4	-4	20
Net Profit	3	1	-1	

(c) The CFO is extremely worried. Tyson is a price-taker in both the input and output markets and yields per barrel of oil are fixed. If any of three product lines makes losses, the CFO believes she has no choice but to discontinue selling that line. Do you agree with her? Why/why not?

4 points

Answer:

- No, the CFO is not correct.
- Joint costs are not relevant in deciding product line profitability. Total NRV > Total Joint Costs, and each NRV > 0.
- The correct allocation scheme is NRV. Tyson's current scheme is flawed.

(d) What is the cost of crude allocated to each product line under the correct allocation scheme that Tyson should be using? Show calculations.

6 points

Answer:

Tyson should use NRV as follows:

	Gas	Engine Oil	Paraffin	Total
Price	60	15	5	
-Processing Costs	-45	-10	-2	
NRV	15	5	3	23
-NRV%	*15/23*	*5/23*	*3/23*	
-NRV%	*65%*	*22%*	*13%*	
-Allocation Formula for $20 Based on NRV	*(65%)*20*	*(22%)*20*	*(13%)*20*	
-Allocation of $20	**13.04**	**4.35**	**2.61**	20

Question C2 ***16 points***

Easy Kitchen Inc. is a large manufacturer of kitchen appliances. They have three main product lines – dishwashers, refrigerators and ovens. Each product line is a different department, classified as a profit center. Easy Kitchen has a department called IT Support Services (ITSS) that is a service center for the rest of the company. ITSS provides services on the computer information systems installed throughout the company for design, production, inventory control etc.. It costs $100,000 per month to run and maintain ITSS. The three profit centers – dishwashers, refrigerators and ovens - are charged the costs of running and maintaining ITSS. The costs of ITSS are allocated to the three profit centers based on the proportion in which their sales revenues contribute to total revenues. The product lines are viewed as sufficiently profitable, but recently, some product line managers have complained about the allocated charges for ITSS. Here is some data on monthly figures for each profit center.

	Dishwashers	**Refrigerators**	**Ovens**	**Total**
Sales revenue	$250,000	$450,000	$100,000	800,000
Number of exclusive conferences between ITSS personnel and profit center engineers	13	25	7	45
Average length of conference (in hours)	4	3	5	
Conference-hours	52	75	35	162

The total number of hours per month spent by ITSS personnel in exclusive conferences with the engineers of each profit center is referred to as conference-hours. A consultant recommends that Easy Kitchen should shift to an activity-based costing (ABC) system using conference hours as the cost driver to allocate ITSS costs to the three profit centers. This system has not been implemented yet.

(a) What is the allocation of ITSS costs based on the current system?

5 points

Answer:

ITSS's current system:

	Dishwasher	**Refrigerator**	**Oven**	**Total**
Revenue	250	450	100	800
-Revenue%	*250/800*	*450/800*	*100/800*	
-Revenue%	*31%*	*56%*	*13%*	
-Allocation Formula for $100,000 Based on Revenue	*31,250*	*56,250*	*12,500*	

(b) Assume the consultant was successful in identifying the true cost-driver of ITSS costs. If profit center heads also realize what the true cost drivers are, which one is likely to be the most dissatisfied with the current system of allocating costs? Why? Show calculations to support your answer.

6 points

Answer:

	Dishwasher	Refrigerator	Oven	Total
Conference Hours	52	75	35	162
-Conference%	*52/162*	*75/162*	*35/162*	
-Conference%	*32%*	*46%*	*22%*	
-Allocation Formula for $100,000 Based on Revenue	*32,099*	*46,296*	*21,605*	

Refrigerators use much less as a proportion of total conference hours, but they account for a much larger proportion of revenues. If the driver is actually conference hours, then under ITSS's current system, refrigerators are overcosted.

(c) Recall the death spiral problem we discussed in Seligram. Describe how Easy Kitchen could potentially head for a death spiral if the current allocation system is not abandoned. A detailed numerical answer is not necessary, but your arguments should be clear and concise.

5 points

Answer:

Uner ITSS's current system, refrigerators look like an unsatisfactory product. ITSS will receive outside sourcing offers for refrigerators, and ITSS will drop refrigerators and outsource it. Once refrigerators are dropped, the $100,000 now has to be redistributed across the two remaining products of dishwashers and ovens. These products will look unsatisfactory now. It is not easy to immediately reduce ITSS size, which will lead to excess capacity and ultimately a death spiral.

Space for computation

Balance Sheets of CMC Inc.

Year ended Dec 31st,	**2002**	**2003**
ASSETS		
Current Assets		
Cash	1,286	1,387
Accounts Receivables (net of Allowance for Doubtful Accounts of $494 and $526 in 2002 and 2003 respectively)	1,801	2,103
Inventories	1,628	1,896
Total current assets	**4,715**	**5,386**
Long Term Assets		
Property, Plant and Equipment (PP&E)	7,406	8,156
Less: Accumulated Depreciation	3,864	4,070
Net PP&E	**3,542**	**4,086**
Total Assets	***8,257***	***9,472***
LIABILITIES & STOCKHOLERS' EQUITY		
Current Liabilities		
Accounts Payable	1,057	1,527
Present Value of Lease Obligation – current portions	325	354
Other current liabilities	442	554
Total current liabilities	**1,824**	**2,435**
Long Term Liabilities		
Net Bonds Payable	2,738	2,985
Present Value of Lease Obligation – non-current portions	1,620	1,266
Total long term liabilities	**4,358**	**4,251**
Stockholders' Equity		
Capital Stock	1,000	1,000
Retained Earnings	1,075	1,786
Total stockholders' equity	**2,075**	**2,786**
Total Liabilities & Stockholders' Equity	***8,257***	***9,472***

Income Statement of CMC Inc.

During the year	**2003**
Revenues	7,000
Cost of Goods Sold	(4,550)
Gross profits	***2,450***
Selling, General and Administrative Expenses	(803)
Bad Debt Expense	(75)
Total interest and rental expenses*	(472)
Operating profits	***1,100***
Gain on Sale of Assets	130
Profit Before Taxes	***1,230***
Tax expense	(369)
Net Income	***861***

* This includes interest on bonds payable, lease interest and some other miscellaneous interest and rental payments that are not zero.