EM401 Midterm #2 Review Questions

Q1. Based on your experience of the home you grew up in or the home you have made, which of the concepts of financial statements do you think arise in a personal setting, i.e. how much time is spent determining and discussing the concepts? Comments briefly on your answers.

Income statement: how much money (value) have I made in a given time period?

Statement of retained earnings: of the money made since I started, how much has been kept versus being paid out?

Balance sheet: how much do I have at a given point in time, and where did the money come from to acquire this?

Statement of cash flow: what did I do with my cash?

Q2. Polymerco, a North American manufacturer of specialty polymers, has the following highly condensed income statement:

Polymerco Income Statement ($000)		
	This Year	Last Year
Gross sales	25,421	24,224
Bad debt	nil	nil
Net sales	25,421	24,224
COGS	22,243	21,341
Contribution margin	3,178	2,883
CM (%)	12.5	11.9
SG&A	2,122	2,067
Operating Income	1,056	816
Other income and interest on long-term debt	-60	-50
Net income	996	766

Current sales are to North American customers only. The president casually mentions that it would be nice to have more offshore sales to diversify the company. What are your recommendations for the following situations:

- Polymerco's production is running at 84% of capacity
- Polymerco's production is running at 100% of capacity

Q3. A friend of yours decides to start a hotshot business. A hotshot business involves quick deliveries to operating facilities such as refineries or oil wells that have a high marginal cost of down time. His entire proposed customer base is within a narrow area, so trip length is consistent.

He intends to sell the business after one year in order to return to school and wants to keep monthly books in order to demonstrate the value of the business to a potential purchase.

For each of the following scenarios, what expense items should he consider to be within COGS?

- He is the sole employee and hence, responsible for selling, administration, and driving. He buys a pickup truck.
- He buys a pickup truck but decides to look after the office and selling. He pays a friend on a per trip basis to do the driving.
- He pays a friend a per-trip fee to both supply a pickup truck and do the driving.

If the trip length was highly variable (for example, some trips of 15 km and some of 1,500 km) instead of consistent, what other information would you need?

Can you think of a kind of expense that could go into COGS that might create a time problem within your friend's relevant time frame?

Q4. You are the president of a medium-sized manufacturing company, and you face the following situation:

- Margin is falling, and bad debt is rising, nearly dollar by dollar.
- Margin is falling, and bad debt is rising, but only at a fraction of the margin loss. Unit sales are rising.
- Margin is falling, sales are falling, and bad debt is rising.
- Margin is falling, and warranty claim are rising, nearly dollar for dollar.
- Margin is falling, and COGS is increasing, near dollar for dollar.

You have a Chief Financial Officer (CFO), a vice President of Marketing, and a General Manager of Production reporting to you. With which one or two of your staff do you first discuss the issue, and what questions do you try to get answered (one or two sentences per case).

Q5. Your fiend decides to open a video rental outlet that specializes in classic films. Most of her stock is reissued DVDs, and she doesn't change her stock each year. She is not skilled in financial matters and asks you to help her understand her business. She hands you a shoebox full of her receipts and notes, from which you withdraw the following information:

Rent-a-Classic ($)	
Staff wages, Jan-Jun	24,782
Cash register and computer purchase	9,587
Cash receipts for the 3-month period Jan-Mar	24,478

Store fixtures (shelving and counter)	16,000
Cash receipts for the 3-month period Oct-Dec	51,266
WCB and vacation payments for the year	496
Purchase of video stock, used videos	39,000
Advertising (neighborhood dropping of flyers)	266
Cash receipts for the 3-month period Apr-Jun	36,221
Promotion (support a neighborhood hockey team)	400
Office supplies (pens, paper, etc)	396
General manager (aunt's) monthly pay	3,000
Building rental, annual charge (including snow removal)	38,000
Cash receipts for the 3-month period July-Sept	42,875
Membership, South Side Business Association	400
Subscription, Video World Magazine	120
Staff Christmas Party	475
Telephone annual bill	692
Building cleaning, annual charge	5,600
Natural gas, annual charge	3,678
Sold table and six chairs left in store by the previous occupant	500
Advertising (ad in community paper)	400
Software for title and cash management	650
Annual business tax	425
Staff wages Jul-Dec	26,822
Purchase of video stock, new releases	52,000
Annual fee for payroll preparation	480
Electricity and water, annual bill	1,896
Advertising (neighborhood dropping of flyers)	298

Is your friend's business creating value? Is it generating cash? Should she be in this business?

Some hints to do this exercise:

- Is there cost of sales in a video rent business? If no, then ignore the variable cost components.
- Distinguish between assets and expenses. Remember that asset purchases do not go on an income statement, only depreciation.
- Make any reasonable assumption on depreciation by asset class, but be prepared to justify it. Do you think the depreciation period should be set by the life of the assets or the life of the overall business?
- Simplify the income statement by grouping some expenses (e.g. lump all advertishing and promotional costs into one category).
- In addition to the income statement, think about cash flow from the business and the trend line of sales.

Q6. Answer the following questions about depreciation:

a) In one or two sentences, explain the purpose of putting depreciation into an income statement.

b) If an asset has a depreciation period of 12 years, an original value of $13.45 million, and an estimated salvage value of $250,000, what is its accumulated depreciation (straight-line) at the end of the 5th year?
c) An asset has an original purchase value of $12 million, a depreciation period of 6 years, and an estimated salvage value of zero. What is the entry into other income if it is sold for a salvage value of $6 million after four years of operating the piece of equipment? If the salvage value is $4 million? If the salvage value is $2 million? If the salvage value is zero?
d) Assume an asset has an original value of $5 million, a depreciation period of 5 years, and no salvage value. If it is sold after three years for $1 million, then there is $1 million in non-depreciated value that must be reflected in the income statement as other income. Is it true or false? If true, is the entry in other income a loss or a gain. In hindsight, was the operating income for the business understated or overstated for the three year period in which the piece of equipment was operated?

Q7. Oilpatchco is a stand-alone oil field supply and service firm that is 75% owned by a large public traded company. The company has three business lines: a pump product, a connecting rod product, and a service division that services the company's products. (The connecting rod is the metal shaft that connects an oil well's surface motor to the pump at the bottom of the well. Assume that for the five-year period, activity in the oil patch has been steady or growing slightly. The pump product is a new design that is displacing other styles of pumps in specialized applications. Oilpatchco assembles pump components, so the labor content is low compared to the material. Oilpatchco manufactures the connecting rods from raw steel, with capital-intensive equipment. Service is in the field to operating wells and offered through a fleet of vehicles.

This small business has a vice president of marketing (which includes sales), of finance and admin, of manufacturing (which includes research and new product development), and of service. The VP of marketing is responsible for the pump business, the VP of Manufacturing is responsible for the connecting rod business line, and the VP of Service is responsible for the service business line.

Answer the following questions by making a table of key numbers or ratios you have extracted from the income statements through vertical and horizontal analysis:

- Does the business have a problem? If yes, what is the problem?
- If it has a problem, what do you think are possible causes of the problem? Is one possible cause more likely than others?
- Assume you work for a large publicly traded company. If you agree to a transfer to become the president of this business, what would you focus on in the first six months?
- With which direct report(s) would you spend the most time in the first month? Why?
- Provide a marked-up income statement for Oilpatchco with nay supplemental calculations you have done to help in your analysis of the business.

Following are some hints on doing this problem:

- If the income statement has units sold as well as revenue, you should look at price per unit. If a product line is changing rapidly, this may not have meaning, but it can be a measure of price history for a stable product line.

- In analyzing a business over many years, always look at price history and annual growth rate for sales, preferably by product line.
- Think of yourself as a business manager whose job security depends on your ability to analyze this business and identify any problems you see. Use critical judgment.

Look at the five-year history portrayed in the income statement in the following table.

Oilpatchco Income Statements ($000)

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue					
Pumps					
Units sold	421	466	558	679	779
Growth in unit sales (%)					
Revenue	2,515	2,759	3,175	3,782	4,300
Growth in sales revenue					
Price per unit sold					
Warranty and bad debt	35.2	42.8	59.7	75.3	103.2
W/bad debt as % of sales					
Net revenue	2,480	2,716	3,115	3,707	4,197
Cost of goods sold	1,811	2,066	2,469	3,023	3,499
COGS as a % of sales					
COGS per unit sold					
Contribution margin	669	650	646	684	698
CM as a % of sales					
CM per unit sold					
Rod					
Km sold	312.0	327.6	334.2	357.5	379.0
Growth in unit sales (%)					
Revenue	7,017	7,662	8,116	8,926	9,802
Growth in sales revenue (%)					
Price per unit sold					
Warranty and bad debt	63.2	65.9	66.6	63.4	62.7
W/bad debt as % of sales					
Net revenue	6,954	7,597	8,050	8,862	9,739
Cost of goods sold	3,298	3,563	3,717	4,034	4,342
COGS as a % of sales					
COGS per unit sold					
Contribution margin	3,656	4,034	4,332	4,828	5,397
CM as a % of sales					
CM per unit sold					
Service					
Revenue	42,72	4,656	5,255	5,511	5,853
Growth in sales revenue (%)					
Warranty and bad debt	51.3	51.2	47.3	44.1	41.0
W/bad debt as % of sales					
Net revenue	4,221	4605	5207	5467	5,812
Cost of goods sold	1,837	1979	2207	2287	2,400
COGS as a % of sales					
Contribution margin	2,384	2,626	3,000	3,180	3,412
CM as a % of sales					
Total gross revenue	13,804	15,078	16,546	18,219	19,955

Growth in sales revenue (%)					
Total warranty and bad debt	149.6	159.9	173.5	182.7	206.9
W/bad debt as % of sales					
Total net revenue	13,655	14,918	16,372	18,036	19,748
Total cost of goods sold	6,946	7,608	8,393	9,344	10,240
COGS as a % of sales					
Total contribution margin	6,709	7,310	7,979	8,692	9,507
CM as a % of sales					
SG&A Expense					
All expenses less depreciation	2,457	2,555	2,657	2,764	2,874
Depreciation	3,125	3,301	3,456	3,701	3,812
Total SG&A	5,582	5,856	6,113	6,464	6,687
Growth in SG&A					
SG&A as a % of sales					
Operating income	1,126	1,454	1,866	2,227	2,821
Growth in operating income (%)					

Q8. An abbreviated income statement for Startupco is as follows:

Income Statement for Startupco ($0000)		
	Accounts	**% of Sales**
Sales	1,231	100
Less allowance for bad debt/warranty	18	1.5
Net revenue	1213	98.5
Cost of goods sold	486	59.1
Contribution margin	727	
SG&A excluding depreciation	1,109	
Depreciation	420	
Operating income	-802	-65.2
Other income	0	
Net income	-802	-65.2

- Assuming SG&A excluding depreciation is fixed, what is the breakeven sales level at which Startupco covers the nut?
- Assuming SG&A excluding depreciation increases at 30% of sales, i.e. each $1 increase in sales increases SG&A excluding depreciation by $0.30 above its current level, what is the breakeven sales level at which Startupco covers the nut?

In each case, assume that depreciation is fully fixed and COGS is fully variable. Answer each of the two cases for book and cash. **Note in this question, 'book breakeven' means the sales level at which the operating income turns from negative to positive; 'cash breakeven' means the sales level at which the operating income plus the depreciation becomes positive.**

Q9. For Balanceco's current fiscal year, you have the following information:

- Inventory, receivables, and payables are each up 35%, reflecting an improvement in sales.
- Net income for this year is $142,000.
- Balanceco starts the year with three owners, one of whom wants to retire. The owners agree that the retiring owner will have his shares bought back by Balanceco for $100,000. The two remaining owners each receive a dividend of $50,000 late this year. Other than leaving some retained earnings in the business this year, they do not inject any capital.
- A new piece of equipment is purchased for $120,000, very early this year. Its depreciation period is 10 years (All depreciation is straight line).
- Other than the extra depreciation on the new piece of equipment, depreciation on the balance of equipment is unchanged from last year at $80,000 per year.
- Accrued wages are up 25% compared to last year's year-end, i.e. there are 25% more hours worked but unpaid at year-end.
- Cash in the bank and prepaid expenses are the same at year-end this year as they were at the year-end last year.
- The long-term financing is a loan of $200K with a 10-year straight-line retirement. Last year was the third year of this financing (at the end of last year, three years of financing had been completed).

Shown below is the balance sheet of Balanceco for the end of year last year.

Balanceco Balance Sheet Last Year ($000)

Assets			**Liabilities**	
Current Assets			**Current Liabilities**	
Cash		15	Short-term credit line	96
Receivables		123	Accounts payable	66
Short-term investments		—	Accrued expenses	16
Inventory		98	Taxes payable	—
Prepaid expenses		26	Current portion of long-term debt	20
		262		198
Fixed Assets			**Long-Term Debt**	
Land, building, and equipment at cost	800		Repayable grants	—
Less accumulated depreciation	160		Long-term debt	140
		640		
			Shareholders' Equity	
Long-term investments		—	Capital shares	500
Goodwill		—	Retained earnings	64
Total assets		902	**Total liability and equity**	902

Complete Balanceco's balance sheet for this year. What fraction of Balanceco's assets are tied up in inventory and receivables this year?

Is Balanceco in good shape? If not, are the problems due to operational management or financial management? What could Balanceco have done differently?

Q10. Three people set out to build essentially identical apartment buildings in similar real estate markets for the same cost of $3.2 million. The three developers have the following characteristics:

- John is 45 and married with three children between the ages of 8 and 14. Ten years ago, he went bankrupt and lost the title to his home and all assets. He has reestablished himself again but promised himself that he would never again lose it all. He limits his mortgage financing (by the bank) to maximum of 50% of project value.
- Helen is 24 and a recent graduate in civil engineering. Her uncle has decided to stake her in real estate development (give her equity). Helen thinks of herself as being a moderate risk taker and has little bad experience with failure. After discussions with her uncle, she is prepared to bank finance 70% of the project.
- Donald is 38 and determined to become very rich. He has been involved in a number of small business ventures and now wants to get into property development to get rich in a hurry. He has a strong ego and believes he can tolerate failure and bounce back again. He uses his slick and persuasive style to obtain 90% financing from the bank.

The pro forma highly abbreviated first-year income statement for the apartment complex, used in discussions with the bank that is considering the mortgage, is shown in the following table:

Leverage in Good Times ($) (First Year)	John	Helen	Donald
Number of units	56		
Project cost	3,200,000		
Capital cost per unit	57,143		
Annual rent per unit	11,200		
Income at full occupancy	627,200		
Less vacancy factor (5%)	31,360		
Adjusted gross income	595,840		
Cash expenses	162,366		
Depreciation	128,000		
Income before debt service	305,474		
Cash flow before debt service	433,474		
Earning power of the project (%)	9.5		
Leverage (%)	50		

Equity	1,600,000
Debt	1,600,000
Interest cost	128,000
Pre-tax net income	177,474
Tax	70,989
After-tax net income	106,484
Cash flow before principal repayment	234,484
Principal repayment	34,964
Cash flow after principal repayment	199,521
Cash return on equity (%)	12.5

For each of the three developers, complete the projections by calculating first-year pro forma after tax net income and cash flow and a pro forma first-year return on equity based on cash flow after principal repayment.

a. Does each developer have enough cash to make the principal repayment in year 1?
b. For the pro forma case, approximately how many years would it take for each developer to recover his or her equity?

Develop a downside case, where due to downturn in the local economy, the vacancy rate goes from 5% to 20%, and rental income per unit drops by 20%. For each of the three developers, calculate the same figures as for the pro forma case. Check if any developer has negative cash flow and answer A and B.

What would the mortgage lender do if the developer did not have enough cash to make the mortgage payment?

A developer would frequently focus on the first one to five years of a project rather than do a long-term set of pro forma statements. He or she is mainly concerned with positive cash flow in the early years, i.e. can the development service its debt? The calculation of cash position would assume some short cuts, as is shown in the table. Thus, you can ignore current assets and liabilities (including short-term debt) and just look at the debt on the apartment building. This is pretty accurate for an apartment: inventory is negligible (some light bulbs and faucet washers), and receivables are usually zero since rent is paid in advance. Remember that interest is an expense that is deductible for calculating taxable income (but not principle repayment), so subtract interest cost from income before debt service before calculating tax. In this problem, depreciation for tax and book purposes is the same (which is virtually never true in practice), so you can calculate the tax from the book income. For those that are being taxed, tax cannot be negative, so unless you had other positive income (assue you don't for this problem), a negative income from this apartment does not give you any tax benefit. Principal repayment occurs from after-tax dollars; if you cannot make the principal repayment, the lender will seize the apartment. Finally, return in this problem is cash return on equity: after you service the debt (principal plus interest), how much

cash do you have left over, and what percentage is that of your equity? It is what a developer might focus on.

Why are the returns so different for the three developers? Think about the position of the three developers in good times (when Donald whizzes past you in a Porsche) and bad times (when you step over a homeless Donald on your way to the opera). When the earning power of the investment falls below the cost of money, the interest rate, can John sleep at night through the downturn? Will Helen go under in her first venture? In each case, assume a 20-year mortgage at 8% with an annual level payment of $01.85 per $1,000 original loan, first-year depreciation (book and tax) at 4%, and a tax rate of 40% on net income. Note that the cash expenses of running the apartment complex do not change significantly in the downside case.

For the earning power of the project, use EBIT (Earnings before Income Tax) divided by assets. Think about what happens when the earning power of the project exceeds the cost of debt and when it is lower than the cost of debt. This helps in understanding leverage.

Q11. (Some input information is the same as **Q9**, but provided here again for the completeness of this question) You have been given both 1998 and 1999's balance sheets for Balanceco. Prepare a sources and uses analysis on the two balance sheets and prepare a statement of cash flow, and comment on the health of Balanceco (one paragraph or less).

- The net income for the company in 1999 was $142,000.
- Balanceco starts the year with three owners, one of whom wants to retire. The owners agree that the retiring owner will have his shares bought back by Balanceco for $100,000. The two remaining owners each receive a dividend of $50,000 late this year. Other than leaving some retained earnings in the business this year, they do not inject any capital.
- A new piece of equipment is purchased for $120,000, very early this year. Its depreciation period is 10 years (All depreciation is straight line).
- Other than the extra depreciation on the new piece of equipment, depreciation on the balance of equipment is unchanged from last year at $80,000 per year.
- Accrued wages are up 25% compared to last year's year-end, i.e. there are 25% more hours worked but unpaid at year-end.
- The long-term financing is a loan of $200K with a 10-year straight-line retirement. Last year was the third year of this financing (at the end of last year, three years of financing had been completed).

Shown below is the balance sheet of Balanceco for the end of year 1998

1998 Balanceco Balance Sheet ($000)

Assets		**Liabilities**	
Current Assets		**Current Liabilities**	
Cash	15	Short-term credit line	96
Receivables	123	Accounts payable	66
Short-term investments	—	Accrued expenses	16

Inventory		98	Taxes payable	—
Prepaid expenses		26	Current portion of long-term debt	20
		262		198
Fixed Assets			**Long-Term Debt**	
Land, building, and equipment at cost	800		Repayable grants	—
Less accumulated depreciation	160		Long-term debt	140
		640		
			Shareholders' Equity	
Long-term investments		—	Capital shares	500
Goodwill		—	Retained earnings	64
Total assets		902	**Total liability and equity**	902

Shown below is the balance sheet of Balanceco for the end of year 1999

1999 Balanceco Balance Sheet ($000)

Assets			**Liabilities**	
Current Assets			**Current Liabilities**	
Cash		15	Short-term credit line	252
Receivables		166	Accounts payable	89
Short-term investments		—	Accrued expenses	20
Inventory		132	Taxes payable	—
Prepaid expenses		26	Current portion of long-term debt	20
		339		381
Fixed Assets			**Long-Term Debt**	
Land, building, and equipment at cost	920		Repayable grants	—
Less accumulated depreciation	252		Long-term debt	120
		668		
			Shareholders' Equity	
Long-term investments		—	Capital shares	400
Goodwill		—	Retained earnings	106
Total assets		1,007	**Total liability and equity**	1,007

Q12. Consider the four years of statements of cash flow for the company below. Late in year 2, the ownership of the company changed. From the statements of cash flow, what do you note about the values of the new owners compared to the values of the previous owners?

Statement of Cash Flow ($ million)				
	Year 1	**Year 2**	**Year 3**	**Year 4**
Cash Derived from Operating Activities				
Net income for the year	760	812	740	880
Depreciation and non-cash items	410	510	610	610
Changes in non-cash working capital	-50	-44	28	-34
Total	1,120	1,278	1,378	1,456
Cash Used for Investing Activities				
Purchase of fixed assets	-2,000	-2,000	-580	-595
Loss or gain on sale of assets	0	0	0	0
Total	-2,000	-2,000	-580	-595
Cash Derived from Financing Activities				
Changes in share capital	0	0	0	0
Changes in long-term debt	900	710	-450	-450
Less dividends paid	0	0	-300	-500
Total	900	710	-750	-950
Increase (decrease) in cash	20	-12	48	-89