Wharton MBA • Class of 2018

Waiver

Exam Guide

Wharton
University of Pennsylvania

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Introduction

Prior to Pre-Term, various academic departments will administer waiver and placement exams for the following courses:

- ACCT 611/613 Financial & Managerial Accounting
  - Placement: ACCT 612 Accelerated Financial Accounting
- FNCE 611 Corporate Finance
  - Placement: FNCE 612 Accelerated Corporate Finance
- FNCE 613 Macroeconomics and the Global Economic Environment
- MGEC 612 Microeconomics for Managers: Advanced Applications
- STAT 613 Regression Analysis for Business
  - Placement: STAT 621: Accelerated Regression Analysis for Business

The dates are listed on page 5.

To help you determine if you can realistically pass the exam, each department has provided a sample set of questions similar to those you may encounter during the waiver exam. Use these questions to determine whether or not you are qualified to take the waiver exam and also to study.

■ Prep Coursework for ACCT, FNCE, and STAT

TUESDAY, AUGUST 2 – THURSDAY, AUGUST 4

(Please note that these classes take place before the start of Pre-Term.)

These ACCT, FNCE, and STAT classes are the only classroom reviews offered for waivers. Attendance is not required to take the waiver and placement exams but highly recommended.

ACCT 604: This course is meant for students seeking placement into ACCT 612. ACCT 604 is meant to help qualified students who may need to refresh their knowledge of basic financial accounting concepts. It is not designed for students with little or no previous exposure to accounting.

ACCT 608: This course is designed for students who may be able to waive entirely the accounting requirement but need to refresh their understanding of graduate-level financial accounting concepts. This course is not designed for students with only basic previous exposure to accounting.

FNCE 604: This course is designed for students seeking placement into FNCE 612. FNCE 604 is meant to help qualified students who may need to refresh their knowledge of basic corporate finance concepts. It is not designed for students with little or no previous exposure to corporate finance.

STAT 608: This course is designed for students who wish to review the prerequisite materials for STAT 621 to prepare for the placement exam. It is not designed for students with little or no previous exposure to statistics.

■ Waiver Policies

- There are two deadlines for submitting waiver by credential:
  - **Monday, June 6** – results will be returned by Monday, June 20
  - **Monday, July 11** – results will be returned by Monday, July 25

  We encourage you to submit your credentials as soon as possible in order to determine if you will need to take the waiver prep courses and exams that take place before Pre-Term. **Credentials will not be accepted after the July 11 deadline.**
- To waive by credential, you must meet the stated deadlines. **No credentials will be accepted after Monday, July 11.**
- All waiver exams must be completed by **Monday, August 8**.
- If you do not meet the requirements to waive a course by credential, you may try to waive the same course by taking the waiver exam if one is offered.
- You have only one attempt at each waiver exam and are eligible to take them only in the summer preceding your first year. If you are unable to waive a core course by credential and cannot take the waiver exam at the scheduled time, you must take the course.
- There are no make-up waiver exams.
- If the online waiver module does not recommend you attempt to waive by credential, you may not submit credentials. If you still wish to waive the course, the only way to do so is by taking and passing the waiver exam.
- Students granted waivers for fixed Core courses may still choose to enroll in said courses provided they enroll prior to the close of the add period. To enroll in a waived course, students should contact their academic advisor in the MBA Program Office.

You can register for the exams through the MBA Inside website at mba-inside.wharton.upenn.edu/

Waiver and Placement Exam Schedule 2016 (subject to change)

Friday, August 5 and Monday, August 8

(Exam times to be announced during the summer.)

Course ID	Course Title	Day	Date
ACCT 611/612	Accounting (Waiver and Placement Exams)	Friday	August 5
FNCE 611/612	Corporate Finance†	Friday	August 5
FNCE 613	Macroeconomics and the Global Economic Environment*	Monday	August 8
MGEC 611	Microeconomics for Managers: Foundations	Monday	August 8
STAT 613	Regression Analysis for Managers	Friday	August 5

†Students who score sufficiently well on the FNCE 611 waiver exam are granted waivers for FNCE 611, FNCE 612, and FNCE 614.

**Students who score sufficiently well on FNCE 613 waiver exam will be granted waivers for both FNCE 613 and FNCE 615.*

Accounting ACCT 611

SAMPLE PLACEMENT EXAM

NOTE: This exam reflects coursework for the first 3-4 weeks of ACCT 611 and is a good example of the knowledge needed to place into ACCT 612.

NAME

(Print)

PENN ID NUMBER

(10 middle digits)

■ Instructions

1. This is a 132 point exam. Budget your time to achieve maximum points.

2. Answer the problems only in the space indicated. Answers placed elsewhere will not be graded. Present your work in an orderly fashion to facilitate the awarding of partial credit. Partial credit can only be given for answers that are presented in a manner which is clear, logical, and easily read.

3. There are 18 numbered pages in this booklet. Make sure that you have all of the pages.

4. The exam is closed book and closed notes.

5. Please print your name in the space provided on the first page and on all subsequent pages if you take the exam apart.

6. Hand in the entire exam when you are done.

Question	Points Assigned	Points Scored
Question 1	78	
Question 2	54	
Total	132	

QUESTION I *(78 pts)*

Baiman-Carter Incorporated (BCI) released preliminary financial statements (balance sheet, income statement, and statement of cash flows) in a press release. Subsequent to the release, the company announced that it would have to restate those financial statements because of transactions that the bookkeeper had neglected to record or had recorded incorrectly. Wayne Guay, principal of Guay Capital, has asked you to indicate the effects these errors. In particular, for each transaction, record the transaction to correct the error or omission and indicate the effect on all line items in the Indirect Statement of Cash Flows and the section in which these changes would appear (i.e. operating, investing or financing). Treat each transaction as independent. Wayne did the first transaction as an example.

Example: Services of $5,000 were provided during the period at an expense (all cash) of $1,000, but BCI has not yet been paid for the services. The bookkeeper didn't record these.

Event/Transactions			Statement of Cash Flows	
Dr. Accounts Receivable	5,000		Net Income	+4,000
Cr. Revenue		5,000	- ↑Accts Rec.	-5,000
Dr. Operating Expense	1,000			
Cr. Cash		1,000		
			CFO	-1,000
			CFI	0
			CFF	0

1. *(6 pts)* The company paid cash for next year's insurance coverage ($2,000) on the last day of the accounting period. The bookkeeper never recorded this.

Event/Transactions	Statement of Cash Flows
	NI
	CFO
	CFI
	CFF

2. *(6 pts)* During the year, $3,000 of prepaid advertisements ran in the local newspaper. The bookkeeper recorded the original payment correctly but no other transactions related to this.

Event/Transactions	Statement of Cash Flows
	NI CFO CFI CFF

3. *(6 pts)* The bookkeeper recorded $1,000 of amortization expense during the year. However, that amount should have been $5,000 not $1,000.

Event/Transactions	Statement of Cash Flows
	NI CFO CFI CFF

4. *(6 pts)* Dividends of $5,000 were declared and paid on the last day of the year. The bookkeeper never recorded this.

Event/Transactions	Statement of Cash Flows
	NI CFO CFI CFF

5. *(6 pts)* The company has debt outstanding, with interest expense of $4,000 per year. The interest was incurred this year but will be paid next year. The bookkeeper never recorded this.

Event/Transactions	Statement of Cash Flows
	NI CFO CFI CFF

6. *(6 pts)* The company purchased, for cash, $10,000 worth of PP&E on the last day of the year. The bookkeeper mistakenly recorded it as $1,000.

Event/Transactions	Statement of Cash Flows
	NI CFO CFI CFF

7. *(6 pts)* A new customer placed an order for $3,000 of widgets whose historical cost on BCI's books was $2,000. The customer has not yet paid for the order. This order was not shipped at year end. However, the bookkeeper recorded it as a sale transaction during the year.

Event/Transactions	Statement of Cash Flows
	NI CFO CFI CFF

8. *(6 pts)* Because of an unexpected windfall of cash, the company repaid $8,000 of long-term debt on the last day of the year. The bookkeeper never recorded this event.

Event/Transactions	Statement of Cash Flows
	NI CFO CFI CFF

9. *(6 pts)* The company has a multistage project with a customer that is accounted for using the percentage-of-completion method. In the prior year, the customer paid a $9,000 deposit (total revenues for the project are $9,000). During the year, the company delivered 1/3 of the project to the customer incurring costs of $1,000 in cash (total costs for the project are $3,000). The bookkeeper recorded only the receipt of the deposit and not any other transactions related to this project.

Event/Transactions	Statement of Cash Flows
	NI CFO CFI CFF

10. *(6 pts)* The company issued shares for $5,000 cash. The bookkeeper mistakenly recorded this transaction as a $50,000 increase in owners' equity.

Event/Transactions	Statement of Cash Flows
	NI CFO CFI CFF

11. *(6 pts)* The company incurred $7,000 of administrative expenses, of which $3,000 were paid by year end. The bookkeeper never recorded these transactions.

Event/Transactions	Statement of Cash Flows
	NI CFO CFI CFF

12. *(6 pts)* A customer paid a deposit of $8,000 for an order to be delivered next year. The company acquired $2,000 of inventory on account to begin producing widgets. The bookkeeper never recorded these transactions.

Event/Transactions	Statement of Cash Flows
	NI CFO CFI CFF

13. *(6 pts)* The bookkeeper salary earned for the last month of the year was $10,000. The company will pay the bookkeeper this $10,000 in the next period.

Event/Transactions	Statement of Cash Flows
	NI CFO CFI CFF

QUESTION II *(54 pts)*

Callaway Golf Company designs, manufactures and sells high quality golf clubs and golf balls. The Company also sells golf accessories such as footwear, golf bags, golf gloves, golf headwear, golf towels and golf umbrellas. The Company's products are sold in the United States and in over 100 countries around the world. Refer to the Income Statement, Balance Sheet and Statement of Cash Flows for Callaway which are located on the last three pages of this exam booklet. Please answer the following questions.

Required

1. *(4 pts)* In which year (among those reported) did Callaway raise the most cash from financing activities?

2. *(4 pts)* If Callaway had not paid any dividends in 2003, 2004 and 2005, how much more cash from financing activities would have been raised over this three-year period?

3. *(4 pts)* What was the net book value of long-lived assets sold during 2005?

4. *(4 pts)* If Callaway had not sold any long-lived assets in 2005, how much would cash from investing activities have changed?

Answer _____

(circle one) HIGHER LOWER NO CHANGE

5. *(4 pts)* If Callaway had not sold any long-lived assets in 2005, how much would cash from operating activities have changed?

Answer _____

(circle one) HIGHER LOWER NO CHANGE

6. *(6 pts)* Callaway recognizes warranty expenses as a component of Selling Expenses on the income statement. Assume that Callaway's total costs (cash, replacement equipment, etc) in 2005 to satisfy customers who returned broken golf equipment under warranty was $15,000 thousands (i.e., $15 million). How much warranty expense was included in Selling Expenses by Callaway in their income statement during 2005?

7. *(4 pts)* Provide the entries that reconcile the Retained Earnings T-account between December 31, 2004 and December 31, 2005. Include descriptive titles and amounts for each entry. All dividends declared have been paid by the end of 2005.

Retained Earnings

Beginning Balance	$437,269
Ending Balance	$430,996

8. *(4 pts)* In 2005, Callaway recognized and paid $26,989 in research and development expenses. All of the research was done internally by Callaway. Which section of the Statement of Cash Flows is affected by these expenditures?

9. *(5 pts)* Assume that all of Callaway's 2005 revenues were cash sales. How much cash did Callaway collect from its customers in 2005?

10. *(5 pts)* Now ignore Part 9 above and instead assume that 50% of Callaway's 2005 revenues were cash sales, and the other 50% on account. How much cash would Callaway have collected from its customers in 2005?

11. *(4 pts)* Provide the journal entry to record Callaway's capital expenditures made in cash in 2005. Assume there were no capital expenditures through acquisitions. Include the account titles and amounts. Make as many entries as necessary.

Debit _____

Credit _____

Debit _____

Credit _____

12. *(6 pts)* Assume that all of Callaway's inventory costs are paid in cash except for raw materials that are bought on account from suppliers (also assume that Accounts Payable reflect only raw material purchases). How much cash did Callaway spend on inventory costs in 2005?

CALLAWAY GOLF COMPANY
CONSOLIDATED BALANCE SHEETS
(In thousands, except share and per share data)

	DECEMBER 31, 2005	2004
ASSETS		
Current assets:		
Cash and cash equivalents	$ 49,481	$ 31,657
Accounts receivable, net	98,082	100,378
Inventories, net	241,577	175,982
Deferred taxes	38,192	32,959
Income taxes receivable	2,026	28,697
Other current assets	9,232	14,036
Total current assets	438,590	393,732
Property, plant and equipment, net	127,739	135,865
Intangible assets, net	146,123	159,191
Goodwill	29,068	30,468
Deferred taxes	6,516	9,837
Other assets	16,462	16,667
	$ 764,498	$ 735,737
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 102,134	$ 69,394
Accrued employee compensation and benefits	24,783	26,322
Warranty liability	13,267	12,043
Bank line of credit	—	13,000
Capital leases, current portion	21	39
Total current liabilities	140,205	120,798
Long-term liabilities:		
Deferred compensation	8,323	8,674
Energy derivative valuation account	19,922	19,922
Capital leases, net of current portion	—	26
Commitments and contingencies (Note 13)		
Shareholders' equity:		
Preferred Stock, $.01 par value, 3,000,000 shares authorized, none issued and outstanding at December 31, 2005 and 2004	—	—
Common Stock, $.01 par value, 240,000,000 shares authorized, 84,950,694 shares and 84,785,694 shares issued at December 31, 2005 and 2004, respectively	850	848
Additional paid-in capital	393,676	387,950
Unearned compensation	(9,014)	(12,562)
Retained earnings	430,996	437,269
Accumulated other comprehensive income	3,377	11,081
Less: Grantor Stock Trust held at market value, 5,954,747 shares and 7,176,678 shares at December 31, 2005 and 2004, respectively	(82,414)	(96,885)
Less: Common Stock held in treasury, at cost, 8,500,811 shares and 8,497,667 shares at December 31, 2005 and 2004, respectively	(141,423)	(141,384)
Total shareholders' equity	596,048	586,317
	$ 764,498	$ 735,737

CALLAWAY GOLF COMPANY
CONSOLIDATED STATEMENTS OF OPERATIONS
(In thousands, except per share data)

	YEAR ENDED DECEMBER 31,					
	2005		2004		2003	
Net sales	$ 998,093	100%	$ 934,564	100%	$ 814,032	100%
Cost of sales	583,679	58%	575,742	62%	445,417	55%
Gross profit	414,414	42%	358,822	38%	368,615	45%
Selling expenses	290,074	29%	263,089	28%	207,783	26%
General and administrative expenses	80,145	8%	89,878	10%	65,448	8%
Research and development expenses	26,989	3%	30,557	3%	29,529	4%
Total operating expenses	397,208	40%	383,524	41%	302,760	37%
Income (loss) from operations	17,206	2%	(24,702)	(3)%	65,855	8%
Interest and other income (expense), net	(390)		1,934		3,550	
Interest expense	(2,279)		(945)		(1,522)	
Income (loss) before income taxes	14,537	1%	(23,713)	(3)%	67,883	8%
Provision for (benefit from) income taxes	1,253		(13,610)		22,360	
Net income (loss)	$ 13,284	1%	$ (10,103)	(1)%	$ 45,523	6%
Earnings (loss) per common share:						
Basic	$ 0.19		$ (0.15)		$ 0.69	
Diluted	$ 0.19		$ (0.15)		$ 0.68	
Common equivalent shares:						
Basic	68,646		67,721		66,027	
Diluted	69,239		67,721		66,471	

CALLAWAY GOLF COMPANY
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	YEAR ENDED DECEMBER 31,		
	2005	**2004**	**2003**
CASH FLOWS FROM OPERATING ACTIVITIES:			
Net income (loss)	$ 13,284	$ (10,103)	$ 45,523
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Depreciation and amortization	38,260	51,154	44,496
Loss on disposal of long-lived assets	4,031	7,669	24,163
Tax benefit (reversal of benefit) from exercise of stock options	2,408	2,161	(982)
Noncash compensation	6,527	1,741	15
Net noncash foreign currency hedging loss	—	1,811	2,619
Net loss from sale of marketable securities	—	—	98
Deferred taxes	(3,906)	7,707	(8,320)
Changes in assets and liabilities, net of effects from acquisitions:			
Accounts receivable	2,296	(1,048)	12,698
Inventories	(65,595)	10,299	4,897
Other assets	7,583	1,554	(4,743)
Accounts payable	32,740	(16,945)	(2,561)
Accrued employee compensation and benefits	5,121	(5,895)	(3,898)
Warranty liability	1,224	(584)	(838)
Income taxes receivable and payable	26,676	(40,711)	4,004
Deferred compensation	(351)	(273)	1,572
Net cash provided by operating activities	70,298	8,537	118,743
CASH FLOWS FROM INVESTING ACTIVITIES:			
Capital expenditures on PP&E	(34,259)	(25,986)	(7,810)
Proceeds from sale of long-lived assets	1,363	431	178
Acquisitions, net of cash acquired	—	(9,204)	(160,321)
Proceeds from sale of marketable securities	—	—	24
Net cash used in investing activities	(32,896)	(34,759)	(167,929)
CASH FLOWS FROM FINANCING ACTIVITIES:			
Issuance of Common Stock	14,812	20,311	17,994
Acquisition of Treasury Stock	(39)	(6,298)	(4,755)
Proceeds from (payments on) Line of Credit, net	(13,000)	13,000	—
Dividends paid	(19,557)	(19,069)	(18,536)
Other financing activities	(44)	—	(8,117)
Net cash (used in) provided by financing activities	(17,828)	7,944	(13,414)
Effect of exchange rate changes on cash and cash equivalents	(1,750)	2,595	1,488
Net increase (decrease) in cash and cash equivalents	17,824	(15,683)	(61,112)
Cash and cash equivalents at beginning of year	31,657	47,340	108,452
Cash and cash equivalents at end of year	$ 49,481	$ 31,657	$ 47,340
Supplemental disclosures (See Note 3 for acquisition-related disclosures):			
Cash paid for interest and fees	$ (2,096)	$ (1,384)	$ (835)
Cash paid for income taxes	$ (24,837)	$ (17,379)	$ (30,925)

Accounting ACCT 611

SAMPLE WAIVER EXAM – PART 1

NOTE: The questions in SAMPLE WAIVER EXAM – Part 1 combined with the questions in SAMPLE WAIVER EXAM – Part 2 together comprise a good example of the knowledge needed to waive ACCT 611. SAMPLE WAIVER EXAM – Part 1 covers the topics of accounts receivable, inventory, long-lived assets, and long-term debt. SAMPLE WAIVER EXAM – Part 2 covers the topics of leases, taxes, shareholders' equity, and inter-corporate investments.

NAME

(Print) *Last* *First* *Nickname*

PENN ID NUMBER

(8 middle digits)

■ Instructions

1. Please PRINT your name and Penn ID number on THIS PAGE AND THE NEXT PAGE. USE THE FIRST NAME UNDER WHICH YOU ARE REGISTERED. SEPARATELY LIST YOUR NICKNAME IF YOU USE ONE. Please circle your instructor's name and your class time.

   Please PRINT your name and Penn ID number on the first page of the financial statement packet.

2. This is an 82 point exam. Budget your time to achieve maximum points.

3. This exam consists of a question packet and a separate financial statement packet. The question packet consists of 17 pages. The financial statement packet consists of 10 pages. Make sure you have all of the pages in each packet.

4. Answer the problems **only in the space indicated. Answers placed elsewhere will not be graded.** Present your work in an orderly fashion to facilitate the awarding of partial credit. Partial credit can only be given for answers that are presented in a manner which is clear, logical, and easily read.

5. The exam is closed book and closed notes.

6. Hand in both the question packet and the financial statement packet when you are done.

Question	Points Assigned	Points Scored
Question 1	18	
Question 2	20	
Question 3	23	
Question 4	21	
Total	82	

Questions 1 – 3 are based on the financial statement of Carter's Inc. **for the period ending Jan. 1, 2005 (referred to as fiscal 2004)**. Carter's Inc. is the largest branded marketer of apparel for babies and young children in the department store, national chain, outlet, specialty store, and off-price sales channels, with 8.2% of the market in 2004, up from 7.1% in 2003.

QUESTION I: ACCOUNTS RECEIVABLES AND INVENTORIES

(18 pts assigned) (_____ pts scored)

Assume that Carter's treats Bad Debt Expense as a contra-revenue account, i.e., it is deducted from Sales Revenue to determine Net Sales.

1. *(3 pts)* What was the amount of Bad Debt Expense which Carter's recognized in fiscal 2004?

2. *(3 pts)* By how much would Carter's Inc. net income before taxes have been increased or decreased if they had used the Direct Write-Off method rather than the Allowance method to account for its bad debt? Indicate the amount and whether it would have been an increase or decrease.

$ _____

(circle one) INCREASED DECREASED

3. *(4 pts)* What was the net effect of business acquisitions, business divestitures and foreign currency translation adjustments on Accounts Receivables for fiscal 2004? Indicate the amount and whether the net effect resulted in an increase, decrease or no change in Accounts Receivables. **To receive credit you must show the work behind your answer.**

$ _____

(circle one) INCREASE DECREASE NO CHANGE

4. *(5 pts)* How much in cash did Carter's Inc. collect from its customers in fiscal 2004?

5. *(3 pts)* By how much did Carter's Inc. reduce fiscal 2004's net income before tax as a result of applying Lower of Cost or Market to its inventory?

QUESTION II: LONG-LIVED ASSETS *(20 pts assigned) (_____ pts scored)*

Assume:

1. The depreciation and amortization add-back on the Statement of Cash Flows includes depreciation on Property, Plant and Equipment **as well as amortization on other assets**.
2. The Loss (gain) on disposal of assets on the Statement of Cash Flows includes the loss (gain) on the sale of property, plant and equipment **as well as the loss (gain) on the sale of other assets**.
3. **All depreciation on property, plant and equipment is expensed**.
4. All property, plant and equipment acquired during fiscal 2004 was acquired for cash and all property, plant and equipment sold during fiscal 2004 was sold for cash.
5. Long-lived assets were not affected in fiscal 2004 by any business acquisitions, business divestitures or foreign currency translation adjustments.

1. *(3 pts)* How much depreciation expense on property, plant and equipment did Carter's Inc. recognize in fiscal 2004?

2. *(3 pts)* What was the amount of property, plant and equipment which Carter's Inc. purchased during fiscal 2004?

3. *(4 pts)* What was the net book value of the property, plant and equipment which Carter's Inc. sold (disposed of) during fiscal 2004.

4. *(4 pts)* What was the gain or loss which Carter's Inc. recognized on its sale of property, plant and equipment in fiscal 2004?

$ _____

(circle one) GAIN LOSS NO GAIN OR LOSS

5. *(3 pts)* Refer to the long-lived asset, Trade name. Does Carter's Inc. treat this asset as one that has a definite life (and is therefore amortizable) or as one that has an indefinite life (and therefore not amortizable)? **You must present your reasoning in order to receive any points.**

6. *(3 pts)* In the fiscal year ending December 28, 2002, Carter's Inc. recorded a Write-down of long-lived assets. If that write-down had not been taken, how much greater or less would Carter's Inc. fiscal 2002 Cash from Operating Activities have been?

$ _____

(circle one) GREATER LESS NO EFFECT

QUESTION III: LONG-TERM DEBT *(23 pts assigned) (_____ pts scored)*

Assume:

1. The beginning and ending balances in Current maturities of long-term debt consist entirely of debt that was **issued at par.**
2. All the debt in the fiscal 2004 beginning balance of Current maturities of long-term debt was retired in fiscal 2004.
3. All long-term debt issued in fiscal 2004 was issued for cash.
4. All long-term debt retired during fiscal 2004 was retired with cash.

1. *(3 pts)* What was the amount of long-term debt discount amortized by Carter's Inc. during fiscal 2004?

2. *(2 pts)* What was the amount of long-term debt issued by Carter's Inc. in fiscal 2004?

3a. *(3 pts)* What was the net book value of long-term debt retired **at maturity** by Carter's Inc. in fiscal 2004?

3b. *(3 pts)* What was the gain or loss on the long-term debt which Carter's Inc. retired **at maturity** in fiscal 2004?

$ _____

(circle one) GAIN LOSS NO GAIN OR LOSS

4a. *(5 pts)* What was the cash paid by Carter's Inc. in fiscal 2004 to retire long-term debt **prior to maturity?**

4b. *(4 pts)* What was the **net book value** of long-term debt retired **prior to maturity** by Carter's Inc. in fiscal 2004?

5. *(3 pts)* Consider Carter's Inc. senior subordinated debt. As of the end of fiscal 2004 is the yield to maturity (i.e., the market rate of interest) higher, lower, or the same as it was on the date the senior subordinated debt was issued (i.e., the historical yield to maturity)?

$_____

(circle one) HIGHER LOWER THE SAME

QUESTION IV: INVENTORY *(21 pts assigned) (_____ pts scored)*

Question IV refers to the 2005 financial statements of AK Steel. Assume a 35% tax rate.

1. *(4 pts)* How much greater or less would AK Steel's **2005** cost of goods sold have been if it had always used FIFO for all of its inventory?

$_____

(circle one) GREATER LESS

2. *(5 pts)* What was the dollar effect of input price inflation or deflation on AK Steel's LIFO Reserve during 2005?

3. *(4 pts)* The following statement is made in AK Steel's Management Discussion and Analysis:

"As a result of the progressively increasing cost of raw materials, the Company recorded LIFO charges in both 2005 and 2004, although those charges decreased to $60.1 from $200.7, year over year."

What was AK Steel's LIFO Reserve as of the end of 2003?

4. *(8 pts)* Assume that AK Steel had always used FIFO rather than LIFO for **both** financial reporting and tax reporting purposes. This would have affected its Statement of Cash Flows in each year. Below are several line items from AK Steel's **2005** Operating Activities section of its Statement of Cash Flows. Indicate the effect on the line items in the Cash flows from operating activities that would be different (both the amount of the difference and the sign) if AK Steel had always used FIFO rather than LIFO for financial and tax reporting purposes. **Note that we are just asking for the one-period effect on AK Steel's 2005 Operating Activities section of its Statement of Cash Flows of AK Steel using FIFO vs. LIFO.** Assume that any additional taxes (to be paid or refunded) in 2005 arising from the use of FIFO rather than LIFO have not yet been paid or received. Assume a 35% tax rate.

Name of "Cash flows from operating activities" line item	**Amount and direction of effect (use +/- to indicate increase/decrease)**
Net Income	
Adjustments to reconcile net income (loss) to cash flows	
Changes in Inventory	
Changes in Other Assets	
Changes in Other liabilities	
Net cash flows from operating activities of continuing operations	

CARTER'S, INC.
AND THE WILLIAM CARTER COMPANY
CONSOLIDATED BALANCE SHEETS
(dollars in thousands, except for share data)

	January 1, 2005	January 3, 2004
ASSETS		
Current assets:		
Cash and cash equivalents	$ 33,265	$ 36,061
Accounts receivable, net of reserve for doubtful accounts of $2,878 in fiscal 2004 and $2,363 in fiscal 2003	80,440	65,318
Inventories, net	120,792	104,760
Prepaid expenses and other current assets	4,499	6,625
Deferred income taxes	12,571	9,045
Total current assets	251,567	221,809
Property, plant, and equipment, net	53,187	50,502
Tradename	220,233	220,233
Cost in excess of fair value of net assets acquired	139,282	139,282
Other assets	2,829	3,485
Total assets	$ 672,965	$ 646,102
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Current maturities of long-term debt	$ 724	$ 3,336
Accounts payable	26,453	30,436
Other current liabilities	40,696	37,405
Total current liabilities	67,873	71,177
Long-term debt	183,778	209,377
Deferred income taxes	83,579	83,196
Other long-term liabilities	9,802	9,816
Total liabilities	345,032	373,566
Commitments and contingencies		
Stockholders' equity:		
Carter's, Inc., preferred stock; par value $.01 per share; 100,000 shares authorized; none issued or outstanding at January 1, 2005 and January 3, 2004	—	—
Carter's, Inc., common stock, voting; par value $.01 per share; 40,000,000 shares authorized; 28,432,452 shares issued and outstanding at January 1, 2005; 27,985,360 shares issued and outstanding at January 3, 2004 (TWCC's common stock, voting; par value $.01 per share; 200,000 shares authorized, 1,000 shares issued and outstanding at January 1, 2005 and January 3, 2004)	284	280
Additional paid-in capital	247,610	241,780
Deferred compensation	(95)	—
Retained earnings	80,134	30,476
Total stockholders' equity	327,933	272,536
Total liabilities and stockholders' equity	$ 672,965	$ 646,102

The accompanying notes are an integral part of these financial statements.

CARTER'S, INC.
AND THE WILLIAM CARTER COMPANY
CONSOLIDATED STATEMENTS OF OPERATIONS
(dollars in thousands, except per share data)

	FOR THE FISCAL YEARS ENDED		
	January 1, 2005	**January 3, 2004**	**December 28, 2002**
Net sales	$ 823,121	$ 703,826	$ 579,547
Cost of goods sold	525,082	448,540	352,151
Gross profit	298,039	255,286	227,396
Selling, general, and administrative expenses	208,756	188,028	174,110
Write-down of long-lived assets	—	—	150
Closure costs	620	1,041	—
Deferred charge write-off	—	—	923
Management fee termination	—	2,602	—
Royalty income	(12,362)	(11,025)	(8,352)
Operating income	101,025	74,640	60,565
Income before income taxes	82,508	38,926	32,264
Provision for income taxes	32,850	15,648	13,011
Net income	$ 49,658	$ 23,278	$ 19,253
CARTER'S, INC.			
Basic net income per common share	$ 1.77	$ 0.99	$ 0.86
Diluted net income per common share	$ 1.66	$ 0.92	$ 0.82
Basic weighted average number of shares outstanding	28,125,584	23,611,372	22,453,088
Diluted weighted average number of shares outstanding	29,927,957	25,187,492	23,544,900

The accompanying notes are an integral part of these financial statements.

CARTER'S, INC.
AND THE WILLIAM CARTER COMPANY
CONSOLIDATED STATEMENTS OF CASH FLOWS
(dollars in thousands)

	FOR THE FISCAL YEARS ENDED		
	January 1, 2005	**January 3, 2004**	**December 28, 2002**
CASH FLOWS FROM OPERATING ACTIVITIES:			
Net income	$ 49,658	$ 23,278	$ 19,253
Loss on extinguishment of debt	xxxxxxxxx	xxxxxxxx	xxxxxxx
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	19,536	22,216	18,693
Amortization of long-term debt discount	75	126	130
Non-cash stock compensation expense	xxxxxxxxx	xxxxxxxxx	xxxxxxxxx
Non-cash closure costs	—	184	—
Write-down of long-lived assets	—	—	150
Loss (gain) on disposal of assets	164	61	(9)
Tax benefit from exercise of stock options	xxxxxxxxx	xxxxxxxxx	xxxxxxxxx
Deferred tax (benefit) provision	(3,143)	299	(1,264)
Effect of changes in operating assets and liabilities:			
Increase in accounts receivable	(15,122)	(11,718)	(18,132)
(Increase) decrease in inventories	(16,032)	940	(16,631)
Decrease (increase) in prepaid expenses and other assets	2,132	(2,258)	2,055
(Decrease) increase in accounts payable and other liabilities	(575)	(4,339)	20,660
Net cash provided by operating activities	42,676	40,506	27,304
CASH FLOWS FROM INVESTING ACTIVITIES:			
Purchase of Property, plant and equipment	(20,481)	(17,347)	(18,009)
Proceeds from sale of property, plant, and equipment	1,304	275	955
Collections on loan	600	600	1,500
Net cash used in investing activities	(18,577)	(16,472)	(15,554)
CASH FLOWS FROM FINANCING ACTIVITIES:			
Payments of term loan	(28,286)	(24,138)	(1,250)
Redemption of 10.875% Senior Subordinated Notes	—	(61,250)	—
Payment of debt redemption premium	—	(6,661)	—
Payment of dividend	—	(24,893)	—
Payments of debt issuance costs	—	(799)	—
Proceeds from stock option exercises	1,555	—	—
Proceeds from sale of common stock	—	600	1,000
Net cash used in financing activities	(26,895)	(23,535)	(880)
Net (decrease) increase in cash and cash equivalents	(2,796)	499	10,870
Cash and cash equivalents at beginning of period	36,061	35,562	24,692
Cash and cash equivalents at end of period	$ 33,265	$ 36,061	$ 35,562

The accompanying notes are an integral part of these financial statements.

NOTE 2: Summary of Significant Accounting Policies

Fiscal Year

Our fiscal year ends on the Saturday in December or January nearest to the last day of December. The accompanying consolidated financial statements reflect our financial position as of January 1, 2005 and January 3, 2004 and results of operations for the fiscal years ended January 1, 2005, January 3, 2004, and December 28, 2002. The fiscal year ended January 3, 2004 (fiscal 2003) contains 53 weeks. The fiscal years ended January 1, 2005 (fiscal 2004) and December 28, 2002 (fiscal 2002), each contain 52 weeks.

Property, Plant, and Equipment

Property, plant, and equipment are stated at cost, less accumulated depreciation. When fixed assets are sold or otherwise disposed, the accounts are relieved of the original costs of the assets, and the related accumulated depreciation and any resulting profit or loss is credited or charged to income. For financial reporting purposes, depreciation and amortization are computed on the straight-line method over the estimated useful lives of the assets as follows: buildings—15 to 26 years and machinery and equipment—3 to 10 years. We capitalize the cost of our fixtures designed and purchased for use at major wholesale and mass channel accounts. The cost of these fixtures is amortized over a three-year period.

Cost in Excess of Fair Value of Net Assets Acquired and Other Intangible Assets

Cost in excess of fair value of net assets acquired ("goodwill") represents the excess of the cost of the Acquisition over the fair value of the net assets acquired.

In connection with the Acquisition, we adopted the provisions of Statements of Financial Accounting Standards ("SFAS") No. 141, "Business Combinations" ("SFAS 141"), and applied the required provisions of SFAS No. 142, "Goodwill and other Intangible Assets" ("SFAS 142"). Accordingly, our tradename and goodwill are deemed to have indefinite lives and are not being amortized. Our licensing agreements, however, recognized in the allocation of the Acquisition purchase price, were amortized over the average three-year life of such agreements, as it was determined that these agreements have finite lives. Amortization expense on our licensing agreements was $3.1 million for fiscal 2004 and $5.0 million in fiscal 2003 and fiscal 2002. The licensing agreements were fully amortized as of August 15, 2004.

We adopted the remaining provisions of SFAS 142 as of the beginning of fiscal 2002. In accordance with this statement, we identified our reporting units, and have completed the required assessments for impairment of goodwill (by comparing the fair values of our reporting units to their respective carrying values, including allocated goodwill) and our tradename and found that there was no impairment of either asset, either at the initial adoption date or at the most recent assessment performed as of January 1, 2005.

We measure our goodwill and tradename for impairment on at least an annual basis or if events or changes in circumstances so dictate.

NOTE 4: Property, Plant, and Equipment

Property, plant, and equipment consisted of the following:

(dollars in thousands)

	January 1, 2005	January 3, 2004
Land, buildings, and improvements	$ 27,333	$ 26,326
Machinery and equipment	53,863	41,766
Marketing fixtures	11,301	14,686
Construction in progress	2,064	676
	94,561	83,454
Accumulated depreciation and amortization	(41,374)	(32,952)
Total	$ 53,187	$ 50,502

Depreciation expense on property, plant and equipment was $16,411,000 for the fiscal year ended January 1, 2005, $17,216,000 for the fiscal year ended January 3, 2004, and $13,693,000 for the fiscal year ended December 28, 2002.

NOTE 5: Long-term Debt

Long-term debt consisted of the following:

(dollars in thousands)

	January 1, 2005	January 3, 2004
Senior credit facility term loan	$ 71,326	$ 99,612
10.875% Series B Senior Subordinated Notes due 2011, net of unamortized discount of $574 in fiscal 2004 and $649 in fiscal 2003	113,176	113,101
	184,502	212,713
Current maturities	(724)	(3,336)
Total	$ 183,778	$ 209,377

The fair value of our senior subordinated notes was approximately $13.7 million greater than the book value as of January 1, 2005 and $17.6 million greater than the book value as of January 3, 2004. The fair values were estimated based on similar issues or on current rates offered to us for debt of the same remaining maturity.

NOTE 12: Valuation and Qualifying Accounts

Information regarding accounts receivable and inventory reserves is as follows:

(dollars in thousands)

	Accounts receivable reserves	Inventory reserves
Balance, December 29, 2001	$ 1,673	$ 1,681
Additions, charged to expense	2,578	1,177
Write-offs	(2,371)	—
Balance, December 28, 2002	1,880	2,858
Additions, charged to expense	2,161	6,682
Write-offs	(1,678)	(4,508)
Balance, January 3, 2004	2,363	5,032
Additions, charged to expense	3,520	11,119
Write-offs	(3,005)	(6,267)
Balance, January 1, 2005	$ 2,878	$ 9,884

AK STEEL HOLDING CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(dollars in thousands, except per share data)

Inventories

Inventories are valued at the lower of cost or market. The cost of the majority of inventories is measured on the last in, first out ("LIFO") method. Other inventories are measured principally at FIFO and consist mostly of foreign inventories and certain raw materials.

	2005	2004
Finished and semifinished	$ 776.3	738.7
Raw materials and supplies	344.4	229.4
Adjustment to state inventories at LIFO value	(351.7)	(291.6)
Total	769.0	676.5

During 2005, 2004 and 2003, liquidation of LIFO layers increased net income before taxes of $9.0, 25.1 and $11.1, respectively.

Accounting ACCT 611

SAMPLE WAIVER EXAM – PART 2

NAME

(Print) *Last* *First* *Nickname*

PENN ID NUMBER

(8 middle digits)

■ Instructions

1. Please PRINT your Penn ID number **on this page and every page of the exam**. Please circle your instructor's name and your class time.

2. This is a 99 point exam. Budget your time to achieve maximum points.

3. This exam consists of a question packet and a separate financial statement packet. The question packet consists of 19 pages. The financial statement packet consists of 13 pages. Make sure you have all of the pages in each packet.

4. Answer the problems **only in the space indicated. Answers placed elsewhere will not be graded**. Present your work in an orderly fashion to facilitate the awarding of partial credit. Partial credit can only be given for answers that are presented in a manner which is clear, logical, and easily read.

5. The exam is closed book and closed notes.

6. Hand in both the question packet and the excerpts from the financial statements when you are done.

Question	Points Assigned	Points Scored
Question 1	35	
Question 2	20	
Question 3	15	
Question 4	29	
Total	99	

Questions 1, 2 and 3 are based on the financial statement of Health Net Inc.

Health Net, Inc. is an integrated managed care organization that delivers managed health care services. We are among the nation's largest publicly traded managed health care companies. Our health plans and government contracts subsidiaries provide health benefits through our health maintenance organizations (HMOs), insured preferred provider organizations (PPOs) and point of service (POS) plans to approximately 6.3 million individuals in 27 states and the District of Columbia through group, individual, Medicare, Medicaid and TRICARE programs.

QUESTION I: TAXES *(35 pts assigned) (_____ pts scored)*

1. *(3 pts)* What was the journal entry to record income tax expense in 2005? You may record a "net" Deferred Tax Asset or Liability – you do not need to distinguish between the two.

Account	Debit	Credit

2. *(4 pts)* What was the company's income **before** tax in 2005? Note that the Income Statement has not been provided.

3. *(3 pts)* The company has a valuation allowance for deferred tax assets. What would be the impact on 2006 income **after taxes** if the company reduced the valuation allowance to $16.5 million in 2006?

$ _____

(circle one) INCREASE DECREASE NO CHANGE

4. *(3 pts)* Assume the balance in income taxes payable at January 1, 2005 was $20.3 million. What was the balance in income taxes payable at December 31, 2005?

All the parts of Question 5 pertain to the tax exempt interest income the company earned in 2005.

5a. *(2 pts)* Indicate whether the tax exempt interest income resulted in an INCREASE, DECREASE or NO CHANGE to the statutory tax rate during 2005:

(circle one) INCREASE DECREASE NO CHANGE

5b. *(2 pts)* Indicate whether the tax exempt interest income resulted in an INCREASE, DECREASE or NO CHANGE to the effective tax rate during 2005:

(circle one) INCREASE DECREASE NO CHANGE

5c. *(2 pts)* Indicate whether the tax exempt interest income resulted in an INCREASE, DECREASE or NO CHANGE to the deferred tax expense during 2005:

(circle one) INCREASE DECREASE NO CHANGE

5d. *(2 pts)* Indicate whether the tax exempt interest income resulted in an INCREASE, DECREASE or NO CHANGE to Net Deferred Tax Assets at December 31, 2005:

(circle one) INCREASE DECREASE NO CHANGE

All the parts of Question 6 pertain only to the **Unearned (or Deferred) Revenue** the company recorded in 2005.

6a. *(3 pts)* The company recorded greater revenue for tax purposes than for financial reporting purposes in 2005. Indicate TRUE or FALSE.

(circle one) TRUE FALSE

6b. *(3 pts)* The company has cumulatively recorded greater revenue for tax purposes than for financial reporting purposes as of Dec. 31, 2005. Indicate TRUE or FALSE.

(circle one) TRUE FALSE

6c. *(4 pts)* For this question only, assume that deferred taxes are recorded at 29%.

How much was the difference between the revenues recognized in 2005 for financial reporting purposes and for tax reporting purposes?

a. 27.7
b. 58.3
c. 2
d. 6.9
e. 3.3
f. 16.9

7. *(4 pts)* Note that Health Net has net Deferred Tax Assets (Deferred Tax Assets are greater than Deferred Tax Liabilities). Suppose Congress announced a tax rate increase commencing in 2006. What effect would this increase in expected future tax rates have on the following for the end of 2005. Indicate whether it would result in an: INCREASE, DECREASE, or NO EFFECT

Net Deferred Tax Asset _____

Income Taxes Payable _____

Income Tax Expense _____

QUESTION II: INTERCORPORATE INVESTMENTS *(20 pts assigned) (_____ pts scored)*

Assume:

1. All of Health Net's intercorporate investments are classified as Available for Sale
2. There were no business acquisitions, business divestitures, foreign currency translation adjustments or impairments which affected Health Net's intercorporate investments during 2005
3. All purchases of intercorporate investments were for cash and all sales were for cash.

1. *(4 pts)* What was the journal entry to record Health Net's overall adjustment to its cumulative unrealized holding gains and losses in 2005 arising either from increases or decreases in the market prices of investments or from the sales of investments for 2005? There is no need to distinguish between a Deferred Tax Asset and Deferred Tax Liability.

Account	Debit	Credit

2. *(4 pts)* What was the historical cost of the Available for Sale securities which Health Net sold or matured in 2005?

3. *(3 pts)* What was the realized holding or loss that Health Net recognized in 2005 on the sale of Available for Sale securities? Indicate the amount and whether it was a realized holding gain or loss.

$_____

(circle one) REALIZED HOLDING GAIN REALIZED HOLDING LOSS

4. *(3 pts)* How much greater or smaller would Health Net's 2005 income before tax have been if it had always accounted for its Available for Sale securities as Trading Securities? Indicate the amount and whether income before tax would have been greater or smaller.

$_____

(circle one) GREATER SMALLER NO DIFFERENT

5. *(3 pts)* **For this question, ignore information from all other parts of this exam.**

What tax rate is Health Net using in 2005 to account for the Deferred Taxes arising from the unrealized holding gain and loss of its Available for Sale securities?

6. *(3 pts)* Assume that Health Net had sold all of its Available for Sale securities on Dec. 31, 2005. How much greater or less would its net income after tax have been? Assume a 40% tax rate. Indicate the amount and whether net income after tax would have been greater or smaller.

_____

(circle one) GREATER SMALLER NO DIFFERENT

QUESTION III: SHAREHOLDERS' EQUITY *(15 pts assigned) (_____ pts scored)*

Please refer to the 2005 financial statements and footnote disclosures of Health Net Inc.

1. *(3 pts)* How many common shares does Health Net have outstanding at Fiscal year-end 2005?

2. Refer to the Treasury Stock that Health Net held at Fiscal year-end 2005. Assume that all of these shares had been repurchased at the same stock price.

a. *(3 pts)* What is the average price per share that Health Net paid for its treasury shares held as of Fiscal year-end 2005?

b. *(3 pts)* Provide the journal entry that Health Net would have recorded if it had decided to reissue all of the treasury shares held at Fiscal year-end 2005 for $750 million.

Account	Debit	Credit

3. Consider the following information disclosed by Health Net:

Earnings Per Share

Diluted earnings per share is based upon the weighted average shares of common stock and dilutive common stock equivalents (this reflects the potential dilution that could occur if stock options were exercised and restricted stocks were vested) outstanding during the periods presented.

For the year ended December 31, 2004, common stock equivalents arising from dilutive stock options and restricted common stock amounted to 6,179 shares (thousands).

Health Net's 2004 Basic EPS = $ 0.38

Weighted average number of shares used in Health Net's 2004 Diluted EPS = 118,038 shares (thousands

a. *(3 pts)* What is Health Net's 2004 Net Income?

b. *(3 pts)* For this question only, assume Health Net's 2004 net income is $50 million. Also, assume Health Net had paid $10 million in preferred dividends in 2004 (in reality, they paid no preferred dividends in 2004). Compute diluted earnings per share in 2004 under this assumption.

QUESTION IV: LEASES *(29 pts assigned) (_____ pts scored)*

Please refer to the 2005 financial statements and footnote disclosures of Safeway Inc.

Safeway Inc. is one of the largest food and drug retailers in North America, with 1,775 stores at year-end 2005. The Company's U.S. retail operations are located principally on the West Coast. The Company's Canadian retail operations are located principally in British Columbia.

Assume that there were no business acquisitions, business divestitures, foreign currency translation adjustments or impairments associated with Safeway's leases during 2005. Further assume that all required payments on all leases are made on the last day of the fiscal year.

1. *(2 pts)* Safeway is considering a new noncancelable lease. The asset to be leased is worth $65,000 and has a useful life of 7 years. The lease would require the firm to pay $11,000 per year for 5 years. There would be no bargain purchase option or transfer of ownership at the end of the lease. Would Safeway categorize this lease as capital or operating?

(circle one) CAPITAL OPERATING

2. *(3 pts)* Record the journal entry that Safeway expects to make in 2006 related to obligations under capital leases. Assume that no leases are prematurely canceled in 2006 and no new leases are entered into in 2006. You are not required to record the journal entry for the capital leased assets (i.e., you are only required to record the entry for the capital lease liabilities).

Account	Debit	Credit

3. *(3 pts)* Estimate the average interest rate that Safeway is using to determine the net book value of its

capital lease liabilities as of fiscal year-end 2005?

4. *(2 pts)* Relative to having no leases, what will be the total effect of Safeway's operating and capital leases on Cash Flow from Operations in 2006? Assume no leases are prematurely canceled in 2006 and no new leases are entered into in 2006.

(circle one) NO EFFECT GREATER SMALLER

by $ _____

5. *(2 pts)* Relative to having no leases, what will be the total effect of Safeway's operating and capital leases on Cash Flow from Investing Activities in 2006? Assume no leases are prematurely canceled in 2006 and no new leases are entered into in 2006.

(circle one) NO EFFECT GREATER SMALLER

by $ _____

6. *(2 pts)* Relative to having no leases, what will be the total effect of Safeway's operating and capital leases on Cash Flow from Financing Activities in 2006? Assume no leases are prematurely canceled in 2006 and no new leases are entered into in 2006.

(circle one) NO EFFECT GREATER SMALLER

by $ _____

7. *(5 pts)* Safeway did cancel capital leases early in 2005. What was the net book value of the assets under capital leases that were cancelled in 2005?

8. *(7 pts)* Assume Safeway were to capitalize its operating leases on January 1, 2006. Further assume that the present value of the operating lease cash flows — using a discount rate of 10% — is $3,589 (millions) and that any resulting assets are amortized straight-line with no salvage value over 10 years.

a. Give the all journal entries for the fiscal year 2006 related to these leases.

Account	Debit	Credit

b. *(3 pts)* How would Safeway's 2006 Cash Flow from Operations be different as a result of capitalizing its operating leases. You need to provide only the direction of the difference — not the dollar value. Assume no leases are prematurely canceled in 2006 and no new leases are entered into in 2006.

(circle one) NO CHANGE GREATER SMALLER

HEALTH NET, INC.
CONSOLIDATED BALANCE SHEETS
(Amounts in thousands)

	DECEMBER 31, 2005	2004
ASSETS		
Current Assets:		
Cash and cash equivalents	$ 742,485	$ 722,102
Investments-available for sale	1,363,800	1,060,000
Premiums receivable, net of allowance for doubtful accounts (2005–$7,204, 2004–$9,016)	132,019	118,521
Amounts receivable under government contracts	122,796	129,483
Other assets	111,512	97,163
Total current assets	2,911,618	2,492,314
Property and equipment, net	125,773	184,643
Goodwill, net	723,595	723,595
Other noncurrent assets	130,267	207,050
Total Assets	$ 3,940,722	$ 3,653,194
LIABILITIES AND STOCKHOLDERS EQUITY		
Current Liabilities:		
Reserves for claims and other settlements	$ 1,040,171	$ 1,169,297
Health care and other costs payable under government contracts	62,536	119,219
IBNR health care costs payable under TRICARE North contract	265,517	173,951
Unearned premiums	106,586	139,766
Accounts payable and other liabilities	364,266	258,923
Total current liabilities	1,839,076	1,861,156
Senior notes payable	387,954	397,760
Other noncurrent liabilities	124,617	121,398
Total Liabilities	2,351,647	2,380,314
Commitments and contingencies		
Stockholders Equity:		
Preferred stock ($0.001 par value, 10,000 shares authorized, none issued and outstanding)	—	—
Common stock ($0.001 par value, 350,000 shares authorized; issued 2005-137,898 shares; 2004-134,450 shares)	137	134
Restricted common stock	6,883	7,188
Unearned compensation	(2,137)	(4,110)
Additional paid-in capital	906,789	811,292
Treasury common stock, at cost (2005-23,182 shares; 2004-23,173 shares)	(633,375)	(632,926)
Retained earnings	1,324,165	1,094,380
Accumulated other comprehensive loss	(13,387)	(3,078)
Total Stockholders Equity	1,589,075	1,272,880
Total Liabilities and Stockholders Equity	$ 3,940,722	$ 3,653,194

See accompanying notes to consolidated financial statements.

HEALTH NET, INC.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(Amounts in thousands)

	Common Stock		Restricted Common Stock	Unearned Compensation	Additional Paid-In Capital	Common Stock Held in Treasury		Retained Earnings	Accumulated Other Comprehensive (Loss) Income	Total
	Shares	Amount				Shares	Amount			
Balance as of December 31, 2004	134,450	134	7,188	(4,110)	811,292	(23,173)	(632,926)	1,094,380	(3,078)	1,272,880
Comprehensive income:										
Net income										
Minimum pension liability adjustment										
Change in unrealized holding gain or loss on investments, net of tax benefit									(10,341)	(10,341)
Total comprehensive income										219,476
Exercise of stock options including related tax benefit	3,411	3			94,106					94,109
Repurchases of common stock						(9)	(449)			(449)
Issuance of restricted stock	30		869	(869)						—
Forfeiture of restricted stock	(13)		(345)	345						—
Amortization of restricted stock grants				2,497						2,497
Lapse of restrictions of restricted stock grants			(829)		829					—
Employee stock purchase plan	20				562					562
Balance as of December 31, 2005	137,898	$137	$6,883	$(2,137)	$906,789	(23,182)	$(633,375)	$1,324,165	$(13,387)	$1,589,075

See accompanying notes to consolidated financial statements.

HEALTH NET, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(amounts in thousands)

	YEAR ENDED DECEMBER 31,		
	2005	**2004**	**2003**
CASH FLOWS FROM OPERATING ACTIVITIES:			
Net income	$ xxxxx	$ xxxxx	$ xxxxx
Adjustments to reconcile net income to net cash provided by (used in) operating activities:			
Other changes	12,550	3,969	5,138
Changes in assets and liabilities, net of effects of dispositions:			
Premiums receivable and unearned premiums	(46,678)	(18,402)	20,163
Other current assets, receivables and noncurrent assets	2,356	(86,499)	35,915
Amounts receivable/payable under government contracts	(49,996)	(175,345)	23,596
Reserves for claims and other settlements	(129,126)	143,012	2,737
Accounts payable and other liabilities	117,556	(15,749)	(13,686)
Net cash provided by (used in) operating activities	191,394	(54,912)	379,772
CASH FLOWS FROM INVESTING ACTIVITIES:			
Proceeds from Sales and Maturities of investments	513,640	556,774	867,221
Purchases of investments	(833,593)	(498,355)	(977,266)
Sales of property and equipment	79,845	9,670	37
Purchases of property and equipment	(48,846)	(47,616)	(54,952)
Cash received from the sale of businesses and properties	1,949	11,112	90,316
Other			
Net cash used in investing activities	(244,046)	(14,242)	(105,522)
CASH FLOWS FROM FINANCING ACTIVITIES:			
Proceeds from exercise of stock options and employee stock purchases	73,484	19,091	42,330
Proceeds from issuance of notes payable and other financing arrangements	—	—	5,680
Repurchases of common stock	(449)	(88,706)	(288,318)
Repayment of debt and other noncurrent liabilities	—	—	(5,864)
Net cash provided by (used in) financing activities	73,035	(69,615)	(246,172)
Net increase (decrease) in cash and cash equivalents	20,383	(138,769)	28,078
Cash and cash equivalents, beginning of year	722,102	860,871	832,793
Cash and cash equivalents, end of year	742,485	$ 722,102	$ 860,871
SUPPLEMENTAL CASH FLOWS DISCLOSURE:			
Interest paid	$ 41,120	$ 30,722	$ 36,296
Income taxes paid	96,324	110,316	126,709

See accompanying notes to consolidated financial statements.

HEALTH NET, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

NOTE 2: Significant Accounting Policies

Cash and Cash Equivalents

Cash equivalents include all highly liquid investments with a maturity of three months or less when purchased.

Investments

Investments classified as available-for-sale are reported at fair value based on quoted market prices, with unrealized gains and losses excluded from earnings and reported as other comprehensive income, net of income tax effects. The cost of investments sold is determined in accordance with the specific identification method and realized gains and losses are included in net investment income.

NOTE 4: Investments

As of December 31, 2005 and 2004, the cost, gross unrealized holding gains and losses, and fair value of our available-for-sale investments were as follows:

	2005			
	COST	GROSS UNREALIZED HOLDING GAINS	GROSS UNREALIZED HOLDING LOSSES	CARRYING VALUE
	(Dollars in millions)			
Mortgage-backed securities	$ 368.1	$ 0.4	$ (7.2)	$ 361.3
U.S. government and agencies	371.6	—	(8.7)	362.9
Obligations of states and other political subdivisions	462.8	1.3	(2.4)	461.7
Corporate debt securities	182.6	—	(4.9)	177.7
Other securities	0.2	—	—	0.2
	$ 1,385.3	$ 1.7	$ (23.2)	$ 1,363.8

	2004			
	COST	GROSS UNREALIZED HOLDING GAINS	GROSS UNREALIZED HOLDING LOSSES	CARRYING VALUE
	(Dollars in millions)			
Mortgage-backed securities	$ 379.1	$ 0.8	$ (2.9)	$ 377.0
U.S. government and agencies	446.0	0.7	(2.9)	443.8
Obligations of states and other political subdivisions	34.8	0.3	(0.1)	35.0
Corporate debt securities	204.6	1.0	(1.4)	204.2
	$ 1,064.5	$ 2.8	$ (7.3)	$ 1,060.0

As of December 31, 2005, the contractual maturities of our available-for-sale investments were as follows:

	COST	ESTIMATED FAIR VALUE
	(Dollars in millions)	
Due in one year or less	$ 94.7	$ 93.9
Due after one year through five years	546.3	533.7
Due after five years through ten years	224.1	222.2
Due after ten years	152.1	152.7
Mortgage-backed securities	368.1	361.3
Total available for sale	$ 1,385.3	$ 1,363.8

NOTE 10: Income Taxes

Significant components of the provision for income taxes are as follows for the years ended December 31:

	2005
	(Dollars in millions)
CURRENT:	
Federal	$ 111.4
State	31.0
Total current	142.4
DEFERRED:	
Federal	3.6
State	0.5
Total deferred	4.1
Total income tax provision	$ 146.5

A reconciliation of the statutory federal income tax rate and the effective income tax rate on income is as follows for the years ended December 31:

	2005	2004	2003
Statutory federal income tax rate	35.0%	35.0%	35.0%
State and local taxes, net of federal income tax effect	5.4	4.1	3.6
Tax exempt interest income	(0.5)	(0.3)	(0.1)
Goodwill and intangible assets amortization	0.1	0.5	0.1
Examination settlements	—	(2.7)	(1.9)
Other, net	(1.1)	0.2	0.8
Effective income tax rate	38.9%	36.8%	37.5%

Significant components of our deferred tax assets and liabilities as of December 31 are as follows:

	2005	2004
	(Dollars in millions)	
DEFERRED TAX ASSETS:		
Accrued liabilities	$ 100.9	$ 101.0
Unearned (or Deferred) Revenues	16.9	18.9
Tax credit carryforwards	0.5	0.8
Accrued compensation and benefits	38.1	32.6
Net operating loss carryforwards	57.8	54.6
Other	9.1	2.9
Deferred tax assets before valuation allowance	223.3	210.8
Valuation allowance	(19.7)	(19.8)
Net deferred tax assets	$ 203.6	$ 191.0
DEFERRED TAX LIABILITIES:		
Depreciable and amortizable property	$ 45.5	$ 44.1
Deferred revenue	19.0	15.1
Other	14.2	9.4
Deferred tax liabilities	$ 78.7	$ 68.6

The net deferred tax assets and liabilities are reported as current and noncurrent deferred tax assets in our consolidated balance sheets for the years ended December 31, 2005 and 2004 based on when the amounts are expected to be realized.

As of December 31, 2005, we had federal and state net operating loss carryforwards of approximately $119.4 million and $282.0 million, respectively. The net operating loss carryforwards expire between 2007 and 2026. Limitations on utilization may apply to approximately $36.4 million and $126.0 million of the federal and state net operating loss carryforwards, respectively. Accordingly, valuation allowances have been provided to account for the potential limitations on utilization of these tax benefits.

SAFEWAY INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(In millions, except per-share amounts)

	YEAR-END 2005	YEAR-END 2004
ASSETS		
Current assets:		
Cash and equivalents	$ 373.3	$ 266.8
Receivables	350.6	339.0
Merchandise inventories, net of LIFO reserve of $48.4 and $48.6	2,766.0	2,740.7
Prepaid expenses and other current assets	212.5	251.2
Total current assets	3,702.4	3,597.7
Property:		
Land	1,413.9	1,396.0
Buildings	4,419.1	4,269.7
Leasehold improvements	2,958.0	2,621.9
Fixtures and equipment	6,558.7	5,981.3
Property under capital leases	779.1	773.8
	16,128.8	15,042.7
Less accumulated depreciation and amortization	(7,031.7)	(6,353.3)
Total property, net	9,097.1	8,689.4
Goodwill	2,402.4	2,406.6
Prepaid pension costs	179.4	321.0
Investments in unconsolidated affiliates	201.8	187.6
Other assets	173.8	175.1
Total assets	$ 15,756.9	$ 15,377.4
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Current maturities of notes and debentures	$ 714.2	$ 596.9
Current obligations under capital leases	39.1	42.8
Accounts payable	2,151.5	1,759.4
Accrued salaries and wages	526.1	426.4
Income taxes	124.2	270.3
Other accrued liabilities	708.8	696.3
Total current liabilities	4,263.9	3,792.1
Long-term debt:		
Notes and debentures	4,961.2	5,469.7
Obligations under capital leases	644.1	654.0
Total long-term debt	5,605.3	6,123.7
Deferred income taxes	223.1	463.6
Accrued claims and other liabilities	744.9	691.1
Total liabilities	10,837.2	11,070.5
Commitments and contingencies		
Stockholders' equity:		
Total stockholders' equity	4,919.7	4,306.9
Total liabilities and stockholders' equity	$ 15,756.9	$ 15,377.4

SAFEWAY INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In millions)

	52 WEEKS 2005	52 WEEKS 2004	53 WEEKS 2003
OPERATING ACTIVITIES:			
Net income (loss)	$ 561.1	$ 560.2	$ (169.8)
Reconciliation to net cash flow from operating activities:			
Net cash flow from operating activities	1,881.0	2,226.4	1,609.6
INVESTING ACTIVITIES:			
Cash paid for property additions	(1,383.5)	(1,212.5)	(935.8)
Proceeds from sale of property	105.1	194.7	189.0
Other	(35.1)	(52.5)	(48.2)
Net cash used by investing activities	(1,313.5)	(1,070.3)	(795.0)
FINANCING ACTIVITIES:			
Additions to short-term borrowings	$ 13.0	$ 11.2	$ 2.6
Payments on short-term borrowings	(23.8)	(1.5)	(3.1)
Additions on long-term borrowings	754.5	1,173.5	1,592.0
Payments on long-term borrowings	(1,188.6)	(2,278.6)	(2,331.0)
Purchase of treasury stock	(1.5)	(0.4)	—
Dividends paid	(44.9)	—	—
Net proceeds from exercise of stock options	18.9	24.8	19.1
Other	5.5	(6.6)	(3.6)
Net cash flow used by financing activities	(466.9)	(1,077.6)	(724.0)
Effect of changes in exchange rates on cash	5.9	13.5	8.2
Increase in cash and equivalents	106.5	92.0	98.8
CASH AND EQUIVALENTS:			
Beginning of year	266.8	174.8	76.0
End of year	$ 373.3	$ 266.8	$ 174.8
OTHER CASH INFORMATION:			
Cash payments during the year for:			
Interest	$ 412.1	$ 434.8	$ 464.2
Income taxes, net of refunds	624.4	43.8	361.6
NON-CASH INVESTING AND FINANCING ACTIVITIES:			
Tax benefit from stock options exercised	$ 9.1	$ 17.4	$ 13.6
Capital lease obligations entered into	27.1	35.9	113.2
Mortgage notes assumed in property additions	3.2	5.5	—

See accompanying notes to consolidated financial statements.

NOTE E: Lease Obligations

Approximately 62% of the premises that the Company occupies are leased. The Company had approximately 1,600 leases at year-end 2005, including approximately 225 that are capitalized for financial reporting purposes. Most leases have renewal options, some with terms and conditions similar to the original lease, others with reduced rental rates during the option periods. Certain of these leases contain options to purchase the property at amounts that approximate fair market value.

As of year-end 2005, future minimum rental payments applicable to non-cancelable capital and operating leases with remaining terms in excess of one year were as follows (in millions):

	CAPITAL LEASES	OPERATING LEASES
2006	$ 105.7	$ 426.1
2007	104.3	410.6
2008	103.9	397.3
2009	94.7	359.9
2010	86.1	330.2
Thereafter	875.0	2,645.9
Total minimum lease payments	1,369.7	$ 4,570.0
Less amounts representing interest	(686.5)	
Present value of net minimum lease payments	683.2	
Less current obligations	(39.1)	
Long-term obligations	$ 644.1	

Amortization expense for property under capital leases was $43.0 million in 2005, $43.4 million in 2004 and $35.4 million in 2003. Accumulated amortization of property under capital leases was $256.7 million at year-end 2005 and $230.9 million at year-end 2004.

The following schedule shows the composition of total rental expense for all operating leases (in millions).

	2005	2004	2003
Property leases:			
Minimum rentals	$ 422.4	$ 406.9	$ 411.4
Contingent rentals[1]	10.8	9.4	11.5
Less rentals from subleases	(30.2)	(28.1)	(31.4)
	403.0	388.2	391.5
Equipment leases	25.7	24.1	25.2
	$ 428.7	$ 412.3	$ 416.7

(1) In general, contingent rentals are based on individual store sales.

Sample Placement Exam Answers ACCT 611

QUESTION I *(78 pts)*

1.

Event/Transactions			Statement of Cash Flows	
Dr. Prepaid Expense	*2000*		NI	*0*
Cr. Cash		*2000*	*- Increase in Prepaid*	*-2000*
			CFO	*-2000*
			CFI	
			CFF	

2.

Event/Transactions			Statement of Cash Flows	
Dr. Advertising Expense	*3000*		NI	*-3000*
Cr. Prepaid Expense		*3000*	*+ Decrease in Prepaid*	*+3000*
			CFO	*0*
			CFI	
			CFF	

3.

Event/Transactions			Statement of Cash Flows	
Dr. Amortization Expense	*4000*		NI	*-4000*
Cr. Accumulated Amortization (or Intangible Assets)		*4000*	*+ Amortization*	*+4000*
			CFO	*0*
			CFI	
			CFF	

4.

Event/Transactions			Statement of Cash Flows	
Dr. Retained Earnings	*5000*		NI	*0*
Cr. Cash		*5000*		
			CFO	*0*
			CFI	
			Dividends Paid	*-5000*
			CFF	*-5000*

5.

Event/Transactions			Statement of Cash Flows	
Dr. Interest Expense	*4000*		NI	*-4000*
Cr. Interest Payable		*4000*	*+ Increase in Interest Pay*	*+4000*
			CFO	*0*
			CFI	
			CFF	

6.

Event/Transactions			Statement of Cash Flows	
Dr. PPE	*9000*		NI	*0*
Cr. Cash		*9000*		
			CFO	*0*
			Purchase PPE	*-9000*
			CFI	*-9000*
			CFF	

7.

Event/Transactions			Statement of Cash Flows	
Dr. Revenue	*3000*		NI	*-1000*
Cr. A/R		*3000*	*+ Decrease AR*	*+3000*
			- Increase Inventory	*-2000*
Dr. Inventory	*2000*		CFO	*0*
Cr. COGS		*2000*		
			CFI	
			CFF	

8.

Event/Transactions			Statement of Cash Flows	
Dr. Long Term Debt	*8000*		NI	*0*
Cr. Cash		*8000*		
			CFO	*0*
			CFI	*0*
			Repay Debt	*-8000*
			CFF	*-8000*

9.

Event/Transactions			Statement of Cash Flows	
Dr. Unearned Revenue	*3000*		NI	*+2000*
Cr. Revenue		*3000*	*- Decrease in Unearned Rev*	*-3000*
Dr. Expense	*1000*			
Cr. Cash		*1000*	CFO	*-1000*
			CFI	
			CFF	

10.

Event/Transactions			Statement of Cash Flows	
Dr. Contributed Capital	*45000*		NI	*0*
Cr. Cash		*45000*		
			CFO	*0*
			CFI	*0*
			- Reversal of issuance	*-45000*
			CFF	*-45000*

11.

Event/Transactions			Statement of Cash Flows	
Dr. Administrative Expense	*7000*		NI	*-7000*
Cr. Cash		*3000*	+ Increase in Accrued Exps	+4000
Cr. Accrued Expenses		*4000*		
			CFO	*-3000*
			CFI	
			CFF	

12.

Event/Transactions			Statement of Cash Flows	
Dr. Cash	*8000*		NI	*0*
Cr. Unearned Revenue		*8000*	*+ Increase in Unearned Rev*	*+8000*
			- Increase in Inventory	*-2000*
Dr. Inventory	*2000*		*+ Increase in Accts Payable*	*+2000*
Cr. Accts Payable		*2000*	CFO	*+8000*
			CFI	
			CFF	

13.

Event/Transactions			Statement of Cash Flows	
Dr. Salary Expense	*10000*		NI	*-10000*
Cr. Salary Payable		*10000*	*+ Increase in Salary Payable*	*+10000*
			CFO	*0*
			CFI	
			CFF	

QUESTION II *(54 pts)*

1. 2004

$7,944 in financing cash flow was raised in 2004.

2. $57,162

Total dividends = $19,557 + $19,069 + $18,536 = $57,162

3. $5394

Proceeds from sale of long-lived assets	$1,363
Add: Loss on disposal of long-lived assets	+$4,031
Book value of long-lived assets sold	$5,394

4. $1,363 LOWER

5. $0 NO CHANGE

All cash flow from the sale of long-lived assets is reflected in investing activities. The loss on the sale is a non-cash item that affects net income, but not cash flow. Therefore, it is added back in the operating activities section but does not result in higher operating cash flow.

6. $16,224

	Warranty Liability
Beginning Balance	12,043
Less: warranties serviced	(15,000)
Warranty expense (plug)	16,224
Ending Balance	13,267

Alternatively, change in warranty liability from CFO ($1,224) can be added to Warranties Serviced to obtain $16,224.

7.

Retained Earnings		
	Beginning Balance	$437,269
	+ Net Income	*13,284*
- Dividends 19,557		
	Ending Balance	$430,996

8. CFO

9. $1,000,389

Accounts Receivable	
Beginning Balance	100,378
Add: Sales on account	0
Less: Cash collected from A/R (plug)	(2,296)
Ending Balance	98,082

Cash revenues of $998,093 + $2,296 collected from A/R equals $1,000,389 in total cash collected from customers.

10. $1,000,389

Accounts Receivable	
Beginning Balance	100,378
Add: Sales on account	499,046.5***
Less: Cash collected from A/R (plug)	(501,342.5)
Ending Balance	98,082

*** 998,093 x 50%

Cash revenues of $499,046.5 + $501,342.5 collected from A/R equals $1,000,389 in total cash collected from customers.

11.

Debit	PPE	34,259
Credit	Cash	34,259

12. $616,534

Inventory		**A/P**	
BB	175,982	BB	69,394
Add: New Raw Mats.	649,274 (plug)	Add: New Raw Mats.	649,274
Less: COGS	(583,679)	Less: Cash paid for A/P	(616,534) (plug)
EB	241,577	EB	102,134

Note: Here, all new inventory is assumed to be raw materials. But, any amount of raw materials up to $649,274 may be assumed as long as the same figure is added to both inventory and A/P, and the remainder of new inventory is assumed to be paid directly in cash.

Sample Waiver Exam – Part 1 Answers ACCT 611

QUESTION I: ACCOUNTS RECEIVABLES AND INVENTORIES

(18 pts assigned) (_____ pts scored)

1. 3520

See Note 12

2. $ 515 INCREASED

Expense – Allowance Method	3520
Expense – Direct Write off Method	3005
Difference	515

3. $0 NO CHANGE

ΔAR – BS	15,122
ΔAR – CFS	15,122

Since the reported changes are the same, the net effect of business acquisitions, etc. must have been zero.

4. $807,999

Sales - ΔAR = 823,121 -15,122 = 807,999

Also

GROSS AR		
BB	65,318+2363	3005 Write-Offs
Sales	823,121 + 3520	
		807,999 Cash Collected (Plug)
EB	80,440 + 2878	

5. $11,119

See Note 12, the column dealing with inventory

QUESTION II: LONG-LIVED ASSETS *(20 pts assigned) (_____ pts scored)*

1. $16,411

See Note 4

2. $20,481

See SCF

3. $1385

PPE, NET			
BB	50,502		
Additions	20,481		
		16,411	Depreciation
		1385	*NBV Disposals - Plug*
EB	53,187		

4. $81 LOSS

Proceeds – NBV sold = 1304 – 1385 = 81

5. INDEFINITE

No change in NBV number on Balance Sheet. Also see Note 2

6. $0 NO EFFECT

QUESTION III: LONG-TERM DEBT *(23 pts assigned) (_____ pts scored)*

1. $ 75

See CFO

2. $0

The change in the net book value of debt as reported in the footnote is completely explained by the discount amortization and the change in the reported NBV of the senior credit facility term loan.

3a. 3336

See beginning balance of Current maturities of long-term debt

3b. $0 NO GAIN OR LOSS

There is never a gain or loss on the retirement of debt at maturity.

4a. 24,950
See SCF

Total cash paid to retire debt - cash paid to retire debt at maturity = cash paid to retire debt prior to maturity

28,286 – 3,336 = 24,950

4b. 24,950

LONG-TERM DEBT, NET			
		209,377	BB
724	debt reclassified as current	0	issued
24,950	*nbv retired prior to maturity - PLUG*	75	discount amortized
		183,778	EB

5. LOWER

See note 5

QUESTION IV: INVENTORY *(21 pts assigned) (_____ pts scored)*

1. $60.1

LESS

Since the question is asking for the effect in just one year, 2005, use change in the lifo reserve

2. $69.1

ΔLifo Reserve = price effect – liquidation effect
60.1 = price effect - 9
price effect = 69.1

3. $90.9

291.6 – 200.7 = 90.9

4.

Name of "Cash flows from operating activities" line item	**Amount and direction of effect (use +/- to indicate increase/decrease)**
Net Income	*39.07 = 60.1 x (1-.35)*
Adjustments to reconcile net income (loss) to cash flows	
Changes in Inventory	*-60.1*
Changes in Other Assets	
Changes in Other liabilities	*21.04 = 60.1 x .35*
Net cash flows from operating activities of continuing operations	*0*

Sample Waiver Exam – Part 2 Answers ACCT 611

QUESTION I: TAXES *(35 pts assigned) (_____ pts scored)*

1.

Account	Debit	Credit
Tax Expense	*146.5*	
Deferred Tax (Asset or Liability)		*4.1*
Tax payable		*142.4*
See the first tax table		

2. $376.6

Effective Tax Rate = Tax Expense/Earnings before Taxes
Earnings before taxes = Tax expense/ETR = 146.5/.389 = 376.6

ETR comes from the second tax table.

3. $3.2 INCREASE

The journal entry for reducing the valuation allowance account is:
Allowance 3.2
Tax expense 3.2

4. $66.376

TAX PAYABLE	
	20.3 BB
Payment 96.324 See the supplementary cash flow information	142.4 current tax expense (see table 1 in the tax footnote and the answer to question 1)
	66.376 EB

5a. NO CHANGE

Tax exempt interest does not affect the statutory tax rate. The statutory tax rate is set by the taxing authorities.

5b. DECREASE

Tax exempt interest reduces the effective tax rate since it increases earnings before taxes but does not increase tax expense.

5c. NO CHANGE

Tax exempt interest represents a permanent difference. Deferred taxes arise from timing differences.

5d. NO CHANGE

Tax exempt interest represents a permanent difference. Deferred taxes arise from timing differences.

6a. FALSE

Notice that the deferred tax asset decreased in 2005, therefore there was a credit entry to the account. Hence, Tax expense must have been greater than Tax payable, hence financial income must have been greater than taxable income, hence more revenue must have been recorded for financial than for tax.

6b. TRUE

Since there is a deferred tax asset associated with the Unearned Revenue, cumulatively, more revenue has been recognized for tax than for financial.

6c. d. Change in deferred tax asset/.29 = (18.9 – 16.9)/.29 = 6.9

7. Net Deferred Tax Asset INCREASE
Income Taxes Payable NO EFFECT
Income Tax Expense DECREASE

With a higher tax rate the tax shield associated with the deferred tax asset becomes more valuable, reducing *future* tax payments associated with present and past deferrals, resulting in lower tax expense this period.

QUESTION II: INTERCORPORATE INVESTMENTS *(20 pts assigned) (_____ pts scored)*

1.

Account	Debit	Credit
Other Comprehensive Income	*10.341*	
Deferred Tax Liability (or Asset)	*6.659*	
Allowance for unrealized price changes		*17*
The credit entry is the change in the allowance account reported in the footnote. The entry to OCI is found in the statement of shareholders' equity. The entry to DTL is the plug.		

2. $512.793

AVAILABLE FOR SALE – HISTORICAL COST			
BB	1064.5		
Purchases	833.593 from the SCF	512.793	Historical cost sold - plug
EB	1385.3		

3. $847 REALIZED HOLDING GAIN

Gain = Proceeds – Historical Cost = 513.64 (from SCF) – 512.793 = 847

4. $17 SMALLER

NIBT(trading) = NIBT(afs) + ΔAllowance

5. 39.2 %

(17 – 10.341)/17 = .392
(Pretax effect – after tax effect)/pretax effect

6. $12.9 SMALLER

21.5 x (1 - .4) = cumulative unrealized holding loss x after tax rate

QUESTION III: SHAREHOLDERS' EQUITY *(15 pts assigned) (_____ pts scored)*

1. 114,716

Number of shares issued – treasury = 137,898 – 23,182 = 114,716

2. a. $27.33

633,375/23,173 = $27.33

b.

Account	Debit	Credit
Cash	*750*	
APIC		*116.625*
Treasury Shares		*633.375*

3. a. $42,506,420

Basic EPS x (weighted average number of shares – Basic)
.38 x (118,038,000 – 6,179,000) = $42,506,420

b. $.34

(50,000 – 10,000)/118,038 = .34

QUESTION IV: LEASES *(29 pts assigned) (_____ pts scored)*

1. OPERATING

None of the criteria for capital leases hold

2.

Account	Debit	Credit
Interest expense	*66.6*	
Current maturities of leases	*39.1*	
Cash		*105.7*
The cash payment and the current maturities come from the lease footnote		

3. 9.7 %

Interest expense/net book value of liability = 66.6/683.2 = 9.7%

4. SMALLER by $492.7

Interest expense (capital lease) + operating lease payment = 66.6 + 426.1 = 492.7

5. NO EFFECT

6. SMALLER by $39.1

The effect is the principal payment

7. $4.6

LEASE ASSET — NBV			
BB	773.8 – 230.9	4.6	retirements - plug
New leases	27.1	43	amortization expense
EB	779.1 – 256.7		

8.

Account	Debit	Credit
PPE		
Long Term Lease Obligations	*3589*	*3589*
Long Term Lease Obligation		
Current Portion of Lease Obligation	*67.2*	*67.2*
Interest Expense		
Current Portion of Lease Obligation	*358.9*	
Cash	*67.2*	*426.1*
Amortization Expense		
Accumulated Amortization	*358.9*	*3589*

b. GREATER

Cash flow from operations would be greater because instead of subtracting the entire lease payment you would only be subtracting the principal payment

Corporate Finance (FNCE 611/612)

PLACEMENT/WAIVER EXAM–PART 1

■ Instructions

1. **Please don't open the exam until you are told to do so.**

2. This exam is being administered under the University's rules for academic conduct; the Code of Academic Integrity applies.

3. The exam consists of 5 multiple choice questions and 4 essay questions.

4. Use the white spaces (and backs of pages) in this question booklet as scratch paper for the multiple choice questions. Your final answers should be indicated **with a pen** in the appropriate boxes on page 1 of your answer sheet booklet.

5. Write your answers to the essay questions in the answer sheet booklet. You can use a pen or a pencil. If you need more answer sheets, you can request them, and they will be provided for you. *Do not use the backs of answer sheets, since these back pages will not be graded.*

6. IMPORTANT: Print your name and Penn ID number on the first page of your answer sheet booklet.

7. This is an open-book exam, i.e. you are free to use any course material. You are allowed to use a pocket calculator. Laptop computers and cell phones are not allowed.

8. You have two hours. The time left in the exam will be announced periodically. If you finish early, you can quietly hand in your answer sheet booklet and leave, *unless there is less than ten minutes left in the exam.*

9. **Please stop writing when requested to. There will be a penalty of 20 points for the people who don't.**

10. Remain seated until all the answer sheet booklets (not just yours) have been collected.

PART I: MULTIPLE CHOICE QUESTIONS *(Total points: 25)*

*INSTRUCTIONS: A correct answer to each of these questions is worth 5 points. An incorrect answer is worth 0. Also, for each question that you choose not to answer, you get 1 point. If you do choose to answer, write your answer **clearly** in the appropriate box on page 1 of your Answer Sheet Booklet. Your answers should be **capital** letters written with a **pen**. An empty box will be interpreted as a "no answer."*

1. A 10-year annuity paying $\$x$ at the beginning of every year (i.e. the first of ten payments is made today) is worth the same (today) as an annuity of $300 payable every 6 months for 10 years (20 payments), the first payment of which is due 66 months from now. If the annual interest rate (compounded annually) is 3%, find x.

a. $232.73 **d.** $508.11

b. $502.48 **e.** $521.42

c. $506.23

2. A machine costing $3,000 must be replaced at the end of 8 years. The resale value of the machine at the time of replacement is $600. At what annual discount rate (compounded annually) would it be equally economical to use a similar machine costing $4,000 with a life of 8 years and a resale value of $1,900? (Assume that there is no taxes.)

a. 2.4% **d.** 3.3%

b. 2.7% **e.** 3.6%

c. 3.0%

3. What is the present value of 15 payments of $100 each received every 18 months (the first one occuring in 18 months from now), if the annual discount rate (compounded annually) is 9%?

a. $620.43 **d.** $951.28

b. $875.56 **e.** $1,209.10

c. $930.61

4. Corporate managers can maximize shareholder wealth by choosing positive NPV projects because:

a. all investors have the same preferences.

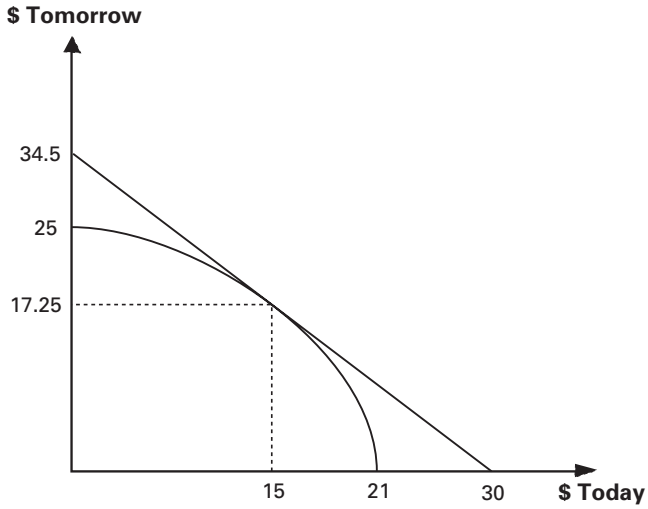
b. the unhappy shareholders can sell off their shares.

c. given the existence of financial markets, investors will be satisfied with the same real investment decisions regardless of personal preferences.

d. managers are wiser than shareholders regarding investments.

e. none of the above.

5. In the figure below, the sloping straight line represents the opportunities for investment in the capital market, and the solid curved line represents the opportunities for investment in plant and machinery (real assets). The company's only asset at present is $21 million in cash.



Note that the figure is not drawn to scale, and that all the numbers are in millions.

Let I denote the optimal amount that should be invested in real assets, and r the interest rate in capital markets. Calculate I/r.

a. 3.2 million
b. 12 million
c. 32 million
d. 40 million
e. 60 million

PART II: ESSAY QUESTIONS *(Total points: 75)*

INSTRUCTIONS: Each of the following questions is to be answered in the Answer Sheet Booklet. You can use a pen or a pencil. If you need more answer sheets, you can request them, and they will be provided for you. ***Do not use the backs of answer sheets****, since these back pages will not be graded. The number of points for each question is indicated in parentheses at the beginning of the question. In answering these questions, make sure to show all your calculations; in particular,* ***no points will be given for calculator shortcuts.***

1. *(20 points)* Every year, you receive your entire annual salary at the end of the year. This year, your end-of-year salary will be $50,000 (in nominal terms). In real terms, you expect your salary to increase at a rate of 2% per year in the future.

You have decided to start saving for retirement by putting money in a savings account. You plan to retire in 35 years, and you expect to live for 25 years after that. You assess that a reasonable lifestyle during those 25 years will require you to have, at the end of every year, a disposable income of $25,000 in real terms (i.e. the same purchasing power as $25,000 today). The nominal interest rate on your savings account is 8%, and it is expected to stay at that rate forever. The real interest rate is also expected to stay at its current level of 3.5%.

a. What is the inflation rate?

b. How much money (in nominal terms) will you need to have in your savings account when you retire, in 35 years (end of year 35), in order to be able to enjoy the lifestyle that you find reasonable? *HINT: First calculate the amount that you will need in real terms.*

c. Suppose that you will start saving for retirement at the end of the current year. Suppose further that you plan to make 35 deposits (one at the end of every year). All deposits are a fixed fraction x of your salary. Find the fraction x that will allow you to reach your "reasonable lifestyle" objective. *HINT: You will need to make use of the growing annuity formula.*

2. *(15 points)* You are a financial analyst for a company that is considering a new project. If the project is accepted, it will use a fraction of a storage facility that the company already owns but currently does not use. The project is expected to last 10 years, and the annual discount rate is 10% (compounded annually).

You research the possibilities, and find that the entire storage facility can be sold for $100,000 and a smaller (but big enough) facility can be acquired for $40,000. The book value of the existing facility is $60,000, and both the exisiting and the new facilities (if it is acquired) would be depreciated straight line over 10 years (down to a zero book value). The corporate tax rate is 40%. What is the opportunity cost of using the existing storage capacity? *HINT: Think about what you would gain and lose if you did not.*

3. *(15 points)* You own a rental building in the city and are interested in replacing the heating system. You are faced with the following alternatives:

a. A solar system, which will cost $12,000 to install and $500 at the end of every year to run, and will last forever (assume that your building will too).

b. A gas-heating system, which will cost $5,000 to install and $1,000 at the end of every year to run, and will last 20 years.

c. An oil-heating system, which will cost $3,500 to install and $1,200 at the end of every year to run, and will last 15 years.

If your opportunity cost of capital (discount rate) is 10%, which of these three options is best for you?

4. *(25 points)* The following bonds are traded in a well functioning market:

BOND	TYPE	FACE VALUE	COUPON	MATURITY	PRICE
A	Zero Coupon Bond	$100	—	1 year	$92.00
B	Coupon Bond	$100	8%	2 years	$101.32

a. Assuming that the coupon bond (bond B) makes only annual payments, what discount factors (DF_1, DF_2) are imbedded in these prices? *NOTE: Show all your calculations; no points will be given for answers found by a sophisticated calculator.*

b. What are the 1-year, and 2-year spot rates (r_1 and r_2)?

c. Suppose that you would like to purchase a two-year coupon bond with a face value of $10,000 and a coupon rate of 6% (with annual coupon payments). Since such a bond is not traded in this economy, what portfolio of bonds A and B could you form to satisfy your needs (i.e. how can you replicate this bond using the original two bonds). *NOTE: Make sure to describe that portfolio clearly, i.e. what you are buying/selling.*

d. What is the exact yield to maturity on

i. bond A;

ii. bond B.

NOTE: Again, show all your calculations; no points will be given for answers found by a sophisticated calculator. In particular, you will need to use the following formula for the roots of $ax^2 + bx + c = 0$*:*

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

Your answers should have at least two decimals, like 9.53%.

Corporate Finance (FNCE 611/612)

PLACEMENT/WAIVER EXAM–PART 2

■ Instructions

PLEASE READ THESE INSTRUCTIONS

1. **Please don't open the exam until you are told to do so.**

2. This exam is being administered under the University's rules for academic conduct; the Code of Academic Integrity applies.

3. The exam consists of 5 multiple choice questions and 4 essay questions.

4. Write all of your answers in the blue booklets. If you need more booklets, you can request them, and they will be provided for you.

5. You must cross out anything that you do not wish to have marked. For the multiple choice questions, please write your letter answers **with a pen**. (You can do your calculations in either pen or pencil. The calculations will not be marked, only the letter answer, so no partial credit is given). For the essay questions, you may use either a pen or a pencil; partial credit may be given.

6. **Important:** Print your name and Penn ID number on the first page of your answer sheet booklet. Also indicate which section of the course you attend, so I can return your exam in the proper section.

7. This is an open-book exam, i.e., you are free to use any course material. You are allowed to use a pocket calculator. Laptop computers and cell phones are not allowed.

8. You have two hours. The time left in the exam will be announced periodically. If you finish early, you can quietly hand in your answer sheet booklet and leave, *unless there is less than ten minutes left in the exam.*

9. **Please stop writing when requested to. There will be a penalty of 20 points for the people who don't.**

10. Remain seated until **all** the answer sheet booklets (not just yours) have been collected.

PART I: MULTIPLE CHOICE QUESTIONS *(Total points: 25)*

*INSTRUCTIONS: A correct answer to each of these questions is worth 5 points. An incorrect answer is worth 0. Also, for each question that you choose not to answer, you get 1 point. If you do choose to answer, write your answer **clearly** on page 1 of your blue booklet. Your answers should be **capital** letters written with a **pen**. Only the final answer will be marked and there shall be no partial credit for the multiple choice questions.*

1. *(5 points)* Suppose that the price of the stock is S_0, and its annual volatility is σ. Suppose also that the annual riskfree rate is r_f. According to Black-Scholes, what is the price of a European put option with a strike price of X maturing in T years? NOTE: In the answers below, we use

$$x = \frac{\log\left(\frac{S_0}{X/(1+r_f)^T}\right)}{\sigma\sqrt{T}} + \frac{1}{2}\sigma\sqrt{T}.$$

a. $\dfrac{X}{(1+r_f)^T}\Big[1 - N(x - \sigma\sqrt{T})\Big] - S_0\Big[1 - N(x)\Big]$

b. $S_0\, N(x) - \dfrac{X}{(1+r_f)^T}\, N(x - \sigma\sqrt{T})$

c. $S_0\, N(x - \sigma\sqrt{T}) - \dfrac{X}{(1+r_f)^T}\, N(x)$

d. $S_0\Big[1 - N(x)\Big] - \dfrac{X}{(1+r_f)^T}\Big[1 - N(x - \sigma\sqrt{T})\Big]$

e. $S_0\Big[1 - N(x - \sigma\sqrt{T})\Big] - \dfrac{X}{(1+r_f)^T}\Big[1 - N(x)\Big]$

2. *(5 points)* Which of the following statements are true?

I. In a perfect capital market, it is advantageous for the firm to issue debt (vs. equity) to finance a project, because the cost of debt (r_D) is always smaller than the cost of equity (r_E).

II. The reason that Modigliani and Miller's Proposition I does not hold in the presence of corporate taxes is because levered firms pay less taxes than identical unlevered firms.

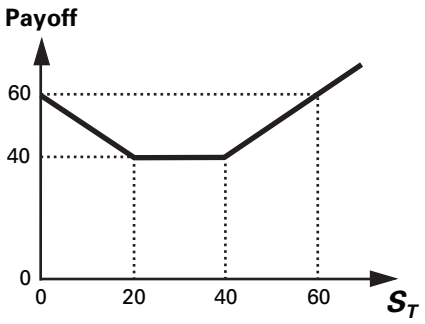
III. Equity financing is always better than debt financing when the personal tax rate on equity income (t_E) is smaller than the personal tax rate on interest income (t_D).

a. I and II
b. I and III
c. II and III
d. I, II and III
e. fewer than two statements are true.

3. *(5 points)* If a firm borrows $50 million for one year (i.e., the firm is levered for one year only) at an interest rate of 9%, what is the present value of the interest tax shield? Assume that there are no personal taxes, and that the corporate tax rate is 35%.

a. $50.000 million
b. $17.500 million
c. $4.128 million
d. $1.575 million
e. $1.445 million

4. *(5 points)* Suppose that you would like to take a position that will give you the following payoff at time T, as a function of the stock price S_T at that time:



Which of the following strategies will give you this position (assume that all the call and put options are European options maturing at T, and are written on the given stock)?

I. Buy 1 put with a strike price of 60, buy 1 call with a strike price of 40, and buy 1 call with a strike price of 20.

II. Buy 1 call with a strike price of 40, buy 1 put with a strike price of 20, and lend (at the riskfree rate) the present value of $40 deliverable at time T.

III. Buy 1 put with a strike price of 40, buy 1 put with a strike price of 20, and buy 1 share of the stock.

a. I and II
b. I and III
c. II and III
d. I, II and III
e. fewer than two positions will give you the desired payoff.

5. *(5 points)* The Hifalutin Corporation has no debt in its capital structure, and the expected rate of return on its equity is 15%. There are 300,000 shares outstanding. The company has expected annual pre-tax earnings of $3 million in perpetuity. The corporate tax rate is 40%. If Hifalutin announces that it will issue $3.75 million worth of perpetual debt and use the entire proceeds to buy back some stocks, what will be its new share price? (Ignore personal taxes.)

a. 40.00
b. 45.00
c. 48.50
d. 50.00
e. 52.50

PART II: ESSAY QUESTIONS *(Total points: 75)*

INSTRUCTIONS: Each of the following questions is to be answered in the blue booklets. You can use a pen or a pencil. If you need more booklets, you can request them, and they will be provided for you. The number of points for each question is indicated in parentheses at the beginning of the question. In answering these questions, make sure to show all your calculations; in particular, ***no points will be given for calculator shortcuts****. Finally, please keep in mind that I can't grade what I can't read.*

1. *(20 points total)* Stiphla Inc.'s real assets are expected to generate earnings before interest and taxes (EBIT) of $102,000 at the end of every year in perpetuity. The firm is currently financed by 50,000 shares each worth $6.11 and by $130,000 worth of perpetual debt issued at a rate of 12%. The corporate tax rate is 35%. Ignore personal taxes and bankruptcy costs.

a. *(2 points)* What is the current total firm value of Stiphla Inc.?

b. *(3 points)* What is the current expected return on Stiphla's equity?

c. *(2 points)* What is Stiphla's weighted average cost of capital (WACC)?

d. *(2 points)* Show that the value of the firm can be obtained by discounting its after-tax earnings at the weighted average cost of capital.

Janine Finch, the CFO of the company, has just found out that Stiphla could issue an additional $130,000 worth of perpetual debt to buy back some equity. However, because the new debt will be junior to the original debt, Stiphla will have to pay a rate of 14% on that new debt.

e. *(2 points)* What is the value of the firm after it goes ahead with the new debt issue?

f. *(4 points)* What is the new expected return on the firm's equity?

g. *(2 points)* Explain why the shareholders are better off (in terms of their total wealth).

h. *(3 points)* What is Stiphla's new weighted average cost of capital (WACC)?

2. *(10 points total)* Firms A and B are both unlevered. The shares of both companies are currently trading at $100, and both offer an annual pre-tax return of 10%. In the case of firm A, the return is entirely in the form of a dividend yield (i.e., the company pays a regular annual dividend of $10 a share). In the case of firm B, the return comes entirely as capital gain (the shares appreciate by 10% a year). Suppose that an investor buys a share of each firm today, and plans to sell them in 10 years. Suppose that dividends and capital gains are both taxed at 30%.

a. *(5 points)* What is the annual after-tax yield (rate of return) on firm A's share over the 10-year period?

b. *(5 points)* What is the annual after-tax yield (rate of return) on firm B's share over the 10-year period?

3. *(25 points total)* The Jack & Diane (JD) Corporation is considering a new 5-year project. Since this project is very different from JD's current operations, the adjusted present value will be used to value the project.

The project requires an initial investment of $750,000 in new assets, which will be depreciated straight-line to 0 over the project's 5-year life. These assets will be worthless in five years, i.e., they will not be resold. (Assume that the depreciation tax shields can be discounted at the project discount rate). Each year for five years, the project is expected to generate pre-tax revenues of $600,000 and to require pre-tax costs of $240,000. The entire project will be financed through a 5-year bank loan with an annual rate of 10%. The principal on the loan will be repaid in equal installments of $150,000 each (i.e., each year, the company pays $150,000 in principal, and pays the interest on the outstanding loan). It is estimated that the pre-tax costs (payable at time zero) of negotiating the loan will be 4% of the amount borrowed.

The project's risk is very similar to the risk of Tommy & Gina (TG) Inc.'s assets. This firm is currently financed by 100,000 shares worth $12.50 each, and $750,000 worth of debt. The beta of TG's stock is 1.5, and the company borrows at a rate of 11%. The riskfree rate in the economy is 8%, and the expected return on the market is 18%. The current corporate tax rate is 45% (assume that it applies to both JD and TG). Ignore personal taxes.

a. *(8 points)* What would be the appropriate discount rate for the project, if it were all-equity financed?

b. *(17 points)* What is the adjusted present value of the project?

4. *(20 points total)* During the upcoming year, the stock price of Delinquent Jesters Inc. (DJ) is expected to go up to $290 or down to $170 with equal probabilities. The beta of the stock is equal to 0.75. The annual riskfree rate is 10.5%, and the expected annual return on the market is 16.5%. You are interested in replicating and pricing a European call option on DJ's stock. The option has a strike price of $212, and will mature in one year.

a. *(4 points)* What is the current price of DJ's stock?

b. *(6 points)* Using the stock and borrowing/lending (at the riskfree rate), form a portfolio that will replicate the call option. How many shares of DJ will you buy/sell, and how much money will you borrow/lend?

c. *(3 points)* Use the portfolio derived in part (b) to price the call option.

d. *(4 points)* What is the beta and expected return of the call option?

e. *(3 points)* Using the result from part (d), show that the price of the call option found in part (c) can also be derived by discounting the expected cash flow of the option.

Placement/Waiver Exam-Part 1 Answers FNCE 611/612

PART I: Multiple Choice Questions

1. **C**. We must have

$$x\,\ddot{a}_{\overline{10}|3\%} = \frac{300}{(1.03)^5} a_{\overline{20}|\hat{r}},$$

where the equivalent semiannual interest rate $\hat{r}$ must satisfy

$$(1+\hat{r})^2 = 1.03 \quad \Rightarrow \quad \hat{r} = 1.4889157\%.$$

Since $\ddot{a}_{\overline{10}|3\%} = 8.7661089$ and $a_{\overline{20}|\hat{r}} = 17.1874132$, we find $x = 506.23$.

2. **D**. The interest rate r must satisfy:

$$\begin{aligned} & -3{,}000 + \frac{600}{(1+r)^8} = -4{,}000 + \frac{1{,}900}{(1+r)^8} \\ \Leftrightarrow \quad & 1{,}000 = \frac{1{,}300}{(1+r)^8} \\ \Leftrightarrow \quad & r = \left(\frac{1{,}300}{1{,}000}\right)^{1/8} - 1 = 3.33\%. \end{aligned}$$

3. **A**. First, let us find the equivalent 18-month rate $\hat{r}$:

$$(1.09)^{3/2} = 1 + \hat{r} \quad \Rightarrow \quad \hat{r} = 13.79934\%.$$

The present value PV of the annuity is therefore

$$PV = 100 a_{\overline{15}|\hat{r}} = \frac{100}{0.1379934}\left[1 - \frac{1}{(1.1379934)^{15}}\right] = 620.43.$$

4. **C**. See section I.3.1 of the lecture notes.

5. **D**. The amount invested in real assets is given by

$$I = 21 \text{ million} - 15 \text{ million} = 6 \text{ million}.$$

The slope of the straight line (capital market investment opportunities) is $-(1+r)$, that is

$$-(1+r) = -\frac{34.5}{30} \quad \Rightarrow \quad r = 15\%.$$

Therefore, $I/r = 40$ million.

PART II: Essay Questions

1. (a) (4 points) The inflation rate is given by

$$i = \frac{1+r}{1+R} - 1 = \frac{1.08}{1.035} - 1 = 4.3478261\%.$$

(b) (8 points) At the end of 35 year, the present value PV_R in real terms of your retirement income is

$$PV_R = 25{,}000 a_{\overline{25}|3.5\%} = \frac{25{,}000}{0.035}\left[1 - \frac{1}{(1.035)^{25}}\right] = 412{,}037.86.$$

Since this amount is in real terms, we need to inflate it for 35 years. Therefore, the nominal amount PV_n needed in the account in 35 years is

$$PV_n = 412{,}037.86(1.043478261)^{35} = 1{,}827{,}495.55.$$

(c) (8 points) The present value at time 0 of the amount needed in the account in 35 years is

$$PV_0 = \frac{412{,}037.86}{(1.035)^{35}} = 123{,}601.83.$$

Alternatively, we could do the calculations in nominal terms:

$$PV_0 = \frac{1{,}827{,}495.55}{(1.08)^{35}} = 123{,}601.83.$$

The present value of your 35 contributions should be equal to this amount. In real terms:

$$123{,}601.83 = \frac{50{,}000x/(1.043478261)}{0.035 - 0.02}\left[1 - \left(\frac{1.02}{1.035}\right)^{35}\right] \quad \Rightarrow \quad x = 9.6713\%.$$

Again, the calculations could have been done in nominal terms, in which case they grow at $g = (1.02)(1+i) - 1 = 6.4347826\%$:

$$123{,}601.83 = \frac{50{,}000x}{0.08 - 0.064347826}\left[1 - \left(\frac{1.064347826}{1.08}\right)^{35}\right] \quad \Rightarrow \quad x = 9.6713\%.$$

2. (15 points) By selling the existing facility, the company would

- gain \$100,000 from the sale;
- pay a tax of

$$(\$100{,}000 - \$60{,}000)(40\%) = \$16{,}000$$

on the capital gain resulting from this sale;

- lose the yearly depreciation tax shield of

$$\frac{\$60{,}000}{10}(40\%) = \$2{,}400$$

for 10 years.

By acquiring the new facility, the company would

- pay \$40,000 to buy the facility;
- gain a yearly depreciation tax shield of

$$\frac{\$40{,}000}{10}(40\%) = \$1{,}600$$

for 10 years.

The present value PV of all these gains and losses represents the opportunity cost of using the existing storage capacity:

$$\begin{aligned} PV &= 100{,}000 - 16{,}000 - 2{,}400a_{\overline{10}|10\%} - 40{,}000 + 1{,}600a_{\overline{10}|10\%} \\ &= 100{,}000 - 16{,}000 - \frac{2{,}400}{0.10}\left[1 - \frac{1}{(1.10)^{10}}\right] - 40{,}000 + \frac{1{,}600}{0.10}\left[1 - \frac{1}{(1.10)^{10}}\right] \\ &= 39{,}084.35. \end{aligned}$$

3. (15 points) There are two equivalent approaches for solving this problem: (i) repeat the cash flows to infinity (which is already done for alternative A), and calculate and compare the net present values; (ii) Calculate and compare the equivalent annual costs of the three alternatives. Let us use the second approach.

   A. The present value of the costs is

$$PV_A = 12{,}000 + \frac{500}{0.10} = 17{,}000.$$

   The equivalent annual cost C_A must solve

$$17{,}000 = \frac{C_A}{0.10} \quad \Rightarrow C_A = 1{,}700.$$

   B. The present value of the costs is

$$PV_B = 5{,}000 + \frac{1{,}000}{0.10}\left[1 - \frac{1}{(1.10)^{20}}\right] = 13{,}513.56.$$

   The equivalent annual cost C_B must solve

$$13{,}513.56 = \frac{C_B}{0.10}\left[1 - \frac{1}{(1.10)^{20}}\right] \quad \Rightarrow C_B = 1{,}587.30.$$

   C. The present value of the costs is

$$PV_C = 3{,}500 + \frac{1{,}200}{0.10}\left[1 - \frac{1}{(1.10)^{15}}\right] = 12{,}627.30.$$

   The equivalent annual cost C_C must solve

$$12{,}627.30 = \frac{C_C}{0.10}\left[1 - \frac{1}{(1.10)^{15}}\right] \quad \Rightarrow C_C = 1{,}660.16.$$

Therefore, alternative B is the best alternative, since it involves the lowest costs.

4. (a) (6 points) Since the price of every bond must be the sum of its discounted cash flows, the discount factors must solve:

$$\begin{array}{rcrcrl} 100DF_1 & + & & = & 92.00 & (1) \\ 8DF_1 & + & 108DF_2 & = & 101.32 & (2) \end{array}$$

Using (1), we have $DF_1 = 0.92$. Using this value for DF_1 in (2), we get

$$DF_2 = \frac{101.32 - 8(0.92)}{108} = 0.87.$$

(b) (4 points) The discount factors can be written as

$$DF_t = \frac{1}{(1+r_t)^t}.$$

Therefore,

$$r_1 = \frac{1}{DF_1} - 1 = 8.69565\%, \quad \text{and}$$
$$r_2 = \frac{1}{DF_2^{1/2}} - 1 = 7.21125\%.$$

(c) (7 points) The bond that you would like to purchase will pay 6%($10,000) = $600 at the end of the first year, and $10,600 at the end of the second year. Let us form a portfolio containing a quantity n_A of bond A, and n_B of bond B. We would like this portfolio to pay $600 at the end of the first year, and $10,600 at the end of the second year. Mathematically we would like n_A and n_B to satisfy:

$$\begin{array}{rcrcrl} 100\ n_A & + & 8\ n_B & = & 600 & (1) \\ & + & 108\ n_B & = & 10{,}600 & (2) \end{array}$$

Using (2), we have $n_B = \frac{10{,}600}{108} = 98.148148$. Using this value for n_B in (1), we get

$$n_A = \frac{600 - 8(98.148148)}{100} = -1.851852.$$

Therefore, the portfolio that would replicate the 6% coupon bond would consist in selling 1.851852 units of bond A, and buying 98.148148 units of bond B.

(d) (i) (3 points) The yield on a zero-coupon bond with a maturity of t years is simply the t-year spot rate. Therefore the yield y_A of bond A is $y_A = r_1 = 8.69565\%$.

(ii) (5 points) The yield to maturity y_B for bond B has to satisfy

$$101.32 = \frac{8}{1+y_B} + \frac{108}{(1+y_B)^2} \quad \Leftrightarrow \quad 108x^2 + 8x - 101.32 = 0, \text{ where } x = \frac{1}{1+y_B}.$$

Solving for x using the quadratic equation formula, we find

$$\frac{1}{1+y_B} = x = \frac{-8 \pm \sqrt{(8)^2 - 4(108)(-101.32)}}{2(108)} = 0.9327379.$$

Solving for y_B (ignoring the "minus" root, which has no economic meaning), we find $y_B = 7.26721\%$.

Placement/Waiver Exam-Part 2 Answers FNCE 611/612

PART I: Multiple Choice Questions

1. **A**. We know from Black-Scholes that the price of a call option with strike X maturity T is

$$C_0 = S_0\,N(x) - \frac{X}{(1+r_f)^T}\,N(x-\sigma\sqrt{T}).$$

We can then find the price of the put by using the put-call parity relationship:

$$\begin{aligned} P_0 &= C_0 - S_0 + \frac{X}{(1+r_f)^T} \\ &= S_0\,N(x) - \frac{X}{(1+r_f)^T}\,N(x-\sigma\sqrt{T}) - S_0 + \frac{X}{(1+r_f)^T} \\ &= \frac{X}{(1+r_f)^T}\Big[1-N(x-\sigma\sqrt{T})\Big] - S_0\Big[1-N(x)\Big]. \end{aligned}$$

2. **E**. (I) FALSE. In a perfect capital market, the capital structure of a firm does not affect its value. (II) TRUE. The advantage of debt financing comes from the very fact that less taxes are being paid. (III) FALSE. Equity financing is better if $(1-t_E)(1-t_c) > (1-t_D)$. This is not always the case when $t_E < t_D$: if t_c is large enough, the inequality goes the other way, and debt financing is more advantageous.

3. **E**. The interest payment at the end of the year is $0.09 \times 50 = 4.5$. This amount is expected to shield $0.35 \times 4.5 = 1.575$ of the firm's profits from taxes. The present value of this amount is $1.575/1.09 = 1.445$.

4. **C**. It can be shown graphically that the last two strategies will give you the desired position. The first one is incorrect for $S_T > 60$ (the slope after that point is 2, not 1, as desired).

5. **B**. The value of the unlevered company (before the debt issue) is

$$V_U = \frac{(1-0.4)3{,}000{,}000}{0.15} = 12{,}000{,}000.$$

The value of the levered company (after the debt issue) will be

$$V_L = V_U + t_c D = 12{,}000{,}000 + 0.4(3{,}750{,}000) = 13{,}500{,}000.$$

The new equity value will be

$$E = V_L - D = 13{,}500{,}000 - 3{,}750{,}000 = 9{,}750{,}000.$$

Letting n denote the number of shares repurchased and S the new price per share, we must have

$$\begin{aligned} nS &= 3{,}750{,}000 \\ (300{,}000 - n)S &= 9{,}750{,}000 \end{aligned}$$

Solving for n and S gives $n = 83{,}333.33$ and $S = 45$.

PART II: Essay Questions

1. (20 points total)

   (a) (2 points) We have $D_L = 130{,}000$ and $E_L = 50{,}000 \times 6.11 = 305{,}500$, so that $V_L = D_L + E_L = 435{,}500$.

   (b) (3 points) The value of the equity can be obtained by discounting the after-tax earnings that will be received by the shareholders:

$$E_L = \frac{(1 - t_c)(\text{EBIT} - r_D D_L)}{r_E}.$$

   This implies

$$\begin{aligned} r_E &= \frac{(1 - t_c)(\text{EBIT} - r_D D_L)}{E_L} \\ &= \frac{(1 - 0.35)[102{,}000 - (0.12)(130{,}000)]}{305{,}500} \\ &= 18.38298\%. \end{aligned}$$

   (c) (2 points) Stiphla's weighted average cost of capital is

$$\begin{aligned} \text{WACC} &= (1 - t_c) r_D \frac{D_L}{V_L} + r_E \frac{E_L}{V_L} \\ &= (1 - 0.35)(0.12)\frac{130{,}000}{435{,}500} + (0.1838298)\frac{305{,}500}{435{,}500} \\ &= 15.22388\%. \end{aligned}$$

   (d) (2 points) The value of the firm can also be obtained as follows:

$$V_L = \frac{(1 - t_c)\text{EBIT}}{\text{WACC}} = \frac{(1 - 0.35)102{,}000}{0.1522388} = 435{,}500.$$

   (e) (2 points) Let us denote by primed variables all the quantities after the new debt issue. The firm's value will go up by the present value of its additional tax shields:

$$V_L' = V_L + t_c(D_L' - D_L) = 435{,}500 + 0.35(260{,}000 - 130{,}000) = 481{,}000.$$

(f) (4 points) The equity is now worth

$$E'_L = V'_L - D'_L = 481{,}000 - 260{,}000 = 221{,}000.$$

As before, the value of the equity can be obtained by discounting the after-tax earnings that will be received by the shareholders:

$$E'_L = \frac{(1-t_c)[\text{EBIT} - (0.12)(130{,}000) - (0.14)(130{,}000)]}{r'_E}.$$

This implies

$$\begin{aligned} r'_E &= \frac{(1-t_c)[\text{EBIT} - (0.12)(130{,}000) - (0.14)(130{,}000)]}{E'_L} \\ &= \frac{(1-0.35)[102{,}000 - (0.12)(130{,}000) - (0.14)(130{,}000)]}{221{,}000} \\ &= 20.05882\%. \end{aligned}$$

(g) (2 points) The shareholders are better off because their wealth went from \$305,500 (in equity only) to \$351,000 (\$221,000 in equity, and \$130,000 in cash from the debt issue).

(h) (3 points) Stiphla's new weighted average cost of capital will be given by

$$\text{WACC}' = (1-t_c)(12\%)\frac{130{,}000}{481{,}000} + (1-t_c)(14\%)\frac{130{,}000}{481{,}000} + r'_E\frac{221{,}000}{481{,}000} = 13.78378\%.$$

Equivalently, the total debt of \$260,000 is issued at an average rate of $\frac{12\%+14\%}{2} = 13\%$, so that

$$\text{WACC}' = (1-t_c)(13\%)\frac{260{,}000}{481{,}000} + r'_E\frac{221{,}000}{481{,}000} = 13.78378\%.$$

Finally, the firm's weighted average cost of capital can also be found by using the fact that the firm's value is given by the after-tax earnings discounted at the WACC:

$$V'_L = \frac{(1-t_c)\text{EBIT}}{\text{WACC}'} \quad \Leftrightarrow \quad \text{WACC}' = \frac{(1-0.35)102{,}000}{481{,}000} = 13.78378\%.$$

(10 points total)

(a) (5 points) Every year, the investor receives \$10, which is taxed at 30%. So, after taxes, the investor receives \$7 each year. At the end of year 10, the investor will sell his share of firm A for \$100, and so will not have any capital gain. His annual after-tax return on his \$100, is therefore $7/100 = 7\%$.

(b) (5 points) The investor will not receive any money until year 10, at which point he will sell his share of firm B for $100(1.10)^{10} = 259.37$. The capital gains of $259.37 - 100 = 159.37$ will then be taxed at 30%. Therefore, the annual after-tax rate of return r satisfies

$$(1+r)^{10} = \frac{259.37 - 0.30(159.37)}{100} \quad \Leftrightarrow \quad r = 7.781\%.$$

3. (25 points total) We are given $r_f = 0.10$, $r_m = 0.18$, and $t_c = 45\%$.

(a) (8 points) Let us first calculate the expected return on TG's stock using the CAPM:

$$r_E = r_f + (r_m - r_f)\beta_E = 0.08 + (0.18 - 0.08)(1.5) = 0.23.$$

TG is financed with $100{,}000 \times \$12.50 = \$1{,}250{,}000$ of equity and \$750,000 of debt, i.e., $E = 1{,}250{,}000$, $D = 750{,}000$, $V = D + E = 2{,}000{,}000$, $D/V = 0.375$, and $E/V = 0.625$. This means that the present value of its tax shields is $t_c \times D = 0.45 \times 750{,}000 = 337{,}500$, and the value of its assets is

$$A = V - \text{PV(tax shields)} = 2{,}000{,}000 - 337{,}500 = 1{,}662{,}500.$$

In other words, a fraction $\frac{1{,}662{,}500}{2{,}000{,}000} = 0.83125$ of the firm's value comes from its assets, and a fraction $1 - 0.83125 = 0.16875$ comes from its tax shields. Since the firm's tax shields have the same risk as its debt, we have

$$\begin{aligned} & 0.83125r_A + 0.16875r_D = 0.375r_D + 0.625r_E \\ \Leftrightarrow \quad & 0.83125r_A + 0.16875(0.11) = 0.375(0.11) + 0.625(0.23) \\ \Leftrightarrow \quad & r_A = 0.2002. \end{aligned}$$

Since the project has the same risk as TG's assets, the appropriate discount rate is $r = r_A = 0.2002$.

Note that this rate could also have been calculated by unlevering TG's weighted average cost of capital (WACC). Indeed, TG's WACC is

$$\text{WACC}_L = (1-t_c)r_D\frac{D}{V} + r_E\frac{E}{V} = (1-0.45)(0.11)(0.375) + (0.23)(0.625) = 0.1664375.$$

Since $\text{WACC}_L = \text{WACC}_U\left(1 - t_c\frac{D}{V}\right)$, we have

$$r_A = \text{WACC}_U = \frac{\text{WACC}_L}{1 - t_c\frac{D}{V}} = \frac{0.1664375}{1 - (0.45)(0.375)} = 0.2002.$$

(b) (17 points) The adjusted present value (APV) of the project is given by

$$\begin{aligned} \text{APV} = -750{,}000 \quad & + \text{NPV(project)} \\ & + \text{PV(interest tax shields)} \\ & - \text{PV(after-tax issuance costs)}. \end{aligned}$$

In each of the project's five years, the after-tax cash flows will be

$$\begin{aligned} \text{CF} &= (\text{after-tax profits}) + (\text{depreciation tax shields}) \\ &= 360{,}000(1-t_c) + t_c\frac{750{,}000}{5} \\ &= 360{,}000(1-0.45) + 0.45(150{,}000) \\ &= 265{,}500. \end{aligned}$$

Therefore, using the discount rate r calculated in part (a), we have

$$\text{NPV(project)} = 265{,}500a_{5|0.2002} = \frac{265{,}500}{0.2002}\left[1 - \frac{1}{(1.2002)^5}\right] = 793{,}613.59.$$

Note that it could also be argued that the depreciation tax shields should be discounted at a rate lower than r, since they are not directly part of the project. For example, we could discount them at $r_D = 10\%$, since the company will benefit from these tax shields in the same years that it will benefit from the interest tax shields. They are also often discounted at $r_f = 8\%$ in practice. In the first case you would then get

$$\text{NPV(project)} = 360{,}000(1-0.45)a_{5|0.2002} + 0.45(150{,}000)a_{5|0.10} = 847{,}725.53.$$

In the second case, you would get

$$\text{NPV(project)} = 360{,}000(1-0.45)a_{5|0.2002} + 0.45(150{,}000)a_{5|0.08} = 861{,}355.35.$$

The present value of the interest tax shields can be calculated using the following table:

Year	Debt outstanding at start of year	Interest	Interest tax shield
1	750,000	75,000	33,750
2	600,000	60,000	27,000
3	450,000	45,000	20,250
4	300,000	30,000	13,500
5	150,000	15,000	6,750

Therefore, we have

$$\text{PV(interest tax shields)} = \frac{33{,}750}{1.10} + \cdots + \frac{6{,}750}{(1.10)^5} = 81{,}621.89.$$

Finally, the after-tax issuance costs are

$$\text{PV(after-tax issuance costs)} = 4\% \times 750{,}000 \times (1-0.45) = 16{,}500.$$

The adjusted present value of the project is therefore

$$\text{APV} = -750{,}000 + 793{,}613.59 + 81{,}621.89 - 16{,}500 = 108{,}735.48.$$

4. (20 points total) We are given $\beta_s = 0.75$, $r_f = 0.105$, and $r_m = 0.165$.

   (a) (4 points) Using the CAPM, the expected return on the stock is

   $$r_s = r_f + (r_m - r_f)\beta_s = 0.105 + (0.165 - 0.105)(0.75) = 0.15.$$

   We can find S_0, the current price of the stock, by discounting the expected cash flow from the stock at r_s:

   $$S_0 = \frac{290(0.5) + 170(0.5)}{1.15} = 200.$$

   (b) (6 points) In the up state, the option will be exercised and will pay $\$290 - \$212 = \$78$. In the down state, the option will not be exercised; the payoff is therefore zero. Let us form a portfolio by buying Δ shares of DJ's stock, and by lending $\$B$. In the up (down) state, this portfolio pays $290\Delta + 1.105B$ ($170\Delta + 1.105B$). We want

   $$\begin{aligned} 290\Delta + 1.105B &= 78; \\ 170\Delta + 1.105B &= 0. \end{aligned}$$

   Solving for Δ and B, we find $\Delta = 0.65$ and $B = -100$. This means that the call option can be replicated by buying 0.65 shares of the stock, and borrowing \$100.

   (c) (3 points) Since the portfolio has exactly the same payoff as the call option, its cost ($200\Delta + B$) should be the price of the call option in a well-functioning market:

   $$C_0 = 200\Delta + B = 200(0.65) + (-100) = 30.$$

   (d) (4 points) Since the call option is a portfolio of the stock and riskfree borrowing, the beta of the call option, β_c, is given by

   $$\begin{aligned} \beta_c &= \frac{200(0.65)}{30}\beta_s + \frac{-100}{30}\beta_{r_f} \\ &= \frac{200(0.65)}{30}(0.75) + \frac{-100}{30}(0) \\ &= 3.25. \end{aligned}$$

   The expected return r_c on the call option can then be obtained using the CAPM:

   $$r_c = r_f + (r_m - r_f)\beta_c = 0.105 + (0.165 - 0.105)(3.25) = 0.30.$$

   (e) (3 points) The expected payoff of the call option is $78(0.5) + 0(0.5) = 39$. The price of the option should therefore be

   $$C_0 = \frac{39}{1 + r_c} = \frac{39}{1.30} = 30.$$

Macroeconomics and the Global Economic Environment (FNCE 613)

SAMPLE EXAM 1

NAME

(IN BLOCK LETTERS)

Class time *(CIRCLE ONE)*: 9:00 a.m. 10:30 a.m. 1:30 p.m.

DO NOT OPEN BOOKLET UNTIL TOLD TO BY PROCTOR

PLEASE DO NOT TURN THE PAGE UNTIL THE EXAM BEGINS.

1. This examination consists of 4 major parts. Altogether there are 11 pages (including this page). When the examination begins, **check immediately to make sure that you have all pages.**

2. PRINT your name LEGIBLY - IN BLOCK LETTERS - at the top of EVERY PAGE immediately after the exam begins. The exam pages will be separated after the exam ends, and it is important that your name be printed on every page. **YOU WILL RECEIVE A BONUS OF 1 POINT FOR EVERY PAGE THAT YOU WRITE YOUR NAME ON USING BLOCK LETTERS.**

3. CIRCLE your CLASS TIME at the top of this page. **YOU WILL RECEIVE ONE BONUS POINT FOR CIRCLING YOUR CLASS TIME AT THE TOP OF THIS PAGE.**

4. Answer all questions concisely in the space provided. If you need additional space to answer a question, use the back of the page **on which the question is typed**, and **indicate clearly on the front of the page** that part of the answer is on the back of the page.

5. This examination is a **closed-book, closed-notes exam**, except that you may use **two sheets of paper** (no larger than 8.5 inches by 11 inches) with anything you want to write on the front and back of these sheets.

6. You may use a calculator, but you may **NOT** use a computer or any other device with communication capability.

7. You will have 2 hours to complete this examination. When time is called at the end of the examination, you must **STOP WRITING IMMEDIATELY**. Heavy penalties will be assessed against students who are observed writing after time is called.

Grading: There are **264** points possible, plus there are 12 bonus points available for writing your name **IN BLOCK LETTERS** at the top of every page and for circling your section time at the top of this page.

QUESTION I. *(104 points)* Each of the following multiple choice questions is worth 4 points. Be sure to write the letter (a, b, c, d) of your response in the space indicated by "Answer _____".

1. Automatic stabilizers Answer _____

a. lead to smaller government budget deficits during recessions than without these stabilizers.

b. reduce the variance of government budget balances.

c. are a step toward creating balanced budgets in recessions and booms.

d. lead to larger government budget deficits during recessions than without these stabilizers.

2. Which of the following does NOT shift the FE line to the left? Answer _____

a. a temporary decline in total factor productivity

b. a decrease in the future marginal product of capital

c. a decline in the labor force participation rate

d. a sudden reduction in the physical capital stock

3. An increase in foreign income that increases the home country's net exports at any given levels of output and real interest rate in the home country will Answer _____

a. shift the home country's FE line to the right.

b. decrease the real interest rate in the home country.

c. shift the home country's IS curve up and to the right.

d. shift the IS curve down and to the left in both countries.

4. A temporary decline in productivity would _____ output, _____ the real interest rate, and _____ the price level when prices adjust. Answer _____

a. reduce; reduce; reduce

b. reduce; increase; reduce

c. reduce; increase; increase

d. not affect; reduce; increase

5. The IS curve would unambiguously shift down and to the left if there were Answer _____

a. an increase in the government budget deficit.

b. an increase in net exports at any given combination of output and the real interest rate.

c. a decrease in both personal taxes and the corporate tax rate.

d. an increase in the corporate tax rate and a decrease in the expected future marginal product of capital.

6. An open-market purchase of bonds by the central bank Answer _____

a. initially leads to an excess supply of both money and bonds.

b. reduces monetary base.

c. reduces the government's budget deficit.

d. increases bond prices and reduces the interest rate at the initial level of output.

7. In a Keynesian economy, if banks increase the interest rate they pay on checking accounts, output would _____ and the real interest rate on nonmonetary assets would _____ in the short run. Answer _____

a. fall; increase

b. remain unchanged; increase

c. increase; increase

d. fall; decrease

8. If the IS/LM intersection is to the right of the FE line, the economy is in a _____, the price level will eventually _____, and the LM curve will then shift _____. Answer _____

a. recession; fall; downward

b. recession; rise; upward

c. boom; rise; upward

d. boom; fall; downward

9. Suppose that the intersection of the IS and LM curves is to the left of the FE line. What would happen to restore general equilibrium in the absence of any monetary or fiscal policy actions? Answer _____

a. Full-employment output would fall, shifting the FE line to the left.

b. Wealth would fall, shifting the LM curve upward and to the left.

c. The price level would fall, shifting the LM down and to the right.

d. The FE line would shift to the left and the IS curve would shift to the right.

10. Which of the following would shift the FE line to the right? Answer _____

a. A rightward shift of the labor supply curve

b. An increase in the expected future marginal product of capital

c. A credible plan to restore solvency to the Social Security system, which induces people to retire earlier

d. A burst of inflation resulting from a sharp increase in the growth rate of money

11. In the classical model with misperceptions, an unanticipated decrease in the money supply would cause output to _____ and the price level to _____ in the short run. Answer _____

a. remain unchanged; increase

b. increase; decrease

c. increase; remain unchanged

d. decrease; decrease

12. An adverse productivity shock that increases both the expected rate of inflation and the natural rate of unemployment would Answer _____

a. shift the short-run Phillips curve upward and rightward and shift the long-run Phillips curve rightward.

b. shift the short-run Phillips curve upward and rightward and leave the long-run Phillips curve unchanged.

c. leave both the short-run Phillips curve and long-run Phillips curve unchanged.

d. twist the short-run Phillips curve and the leave the long-run Phillips curve unchanged.

13. A high value of the sacrifice ratio indicates that Answer _____

a. the future marginal product is low, so that it takes a large increase in capital investment to increase future output.

b. a large part of federal government spending is devoted to the military.

c. consumers have a high rate of time preference and hence do not like to defer consumption to the future.

d. there is a large cost, in terms of lost output, associated with a reduction in the rate of inflation.

14. Over the period of time from the beginning of a hyperinflation to the end of the hyperinflation Answer _____

a. governments tend to run budget surpluses.

b. the average rate of inflation is higher than the average rate of monetary growth.

c. the average rate of inflation equals the average of monetary growth.

d. the average rate of inflation is somewhat lower than the average rate of monetary growth.

15. From January 2001 to May 2012, the Canadian dollar/euro exchange rate changed from 1.41 Canadian dollars/euro to 1.30 Canadian dollars/euro, while the Japanese yen/euro exchange rate changed from 109.5 yen/euro to 106.1yen/euro. Thus, Answer _____

a. the euro appreciated relative to both the Canadian dollar and the yen.

b. the euro appreciated relative to the Canadian dollar, but depreciated relative to the yen.

c. the euro depreciated relative to both the Canadian dollar and the yen.

d. the euro depreciated relative to the Canadian dollar, but appreciated relative to the yen.

16. Over the course of a year, the nominal exchange rate rises by 2%, domestic inflation is 3% per year, and foreign inflation is 1% per year. What is the percentage change in the real exchange rate over the course of the year? Answer _____

a. 0%

b. 2%

c. 4%

d. 6%

17. In the very short run, before the J curve takes effect, a real depreciation will Answer _____

a. have no effect on net exports measured in terms of the home good.

b. reduce net exports measured in terms of the home good.

c. reduce exports and reduce net exports measured in terms of the home good.

d. reduce exports and increase imports measured in terms of the foreign good.

18. Since the beginning of the financial crisis in 2008, U.S. monetary base Answer _____

a. has shrunk by about 50%.

b. has grown steadily by 1% to 3% per year.

c. has been increasingly composed of currency rather than reserve deposits of banks.

d. has roughly tripled in size.

19. According to the Taylor Rule, a 2-percentage-point increase in the inflation rate would lead the Fed to Answer _____

a. reduce the real Federal Funds rate by 2 percentage points.

b. reduce the rate of monetary growth by 2 percentage points.

c. increase the nominal Federal Funds rate by 3 percentage points.

d. conduct open-market purchases of bonds.

20. The actual deficit is _____ than the full-employment deficit at business cycle troughs and _____ than the full-employment deficit at business cycle peaks. Answer _____

a. larger in magnitude; larger in magnitude

b. larger in magnitude; smaller in magnitude

c. smaller in magnitude; larger in magnitude

d. smaller in magnitude; smaller in magnitude

21. A procylical variable Answer _____

a. promotes economic well-being by reducing the misery index.

b. has high volatility over the course of a business cycle.

c. increases during booms and decreases during recessions.

d. makes monetary policy more independent of the treasury.

22. The public, including overseas holders of U.S. Treasury securities, holds about _____ of U.S. Treasury securities; other agencies of the Federal government hold about _____ of U.S. Treasury securities. Answer _____

a. $15 billion; $10 billion

b. $5 trillion; $20 trillion

c. $10 trillion; $5 trillion

d. $15 trillion; $10 trillion

23. For a saver with a zero intertemporal elasticity of substitution, the introduction of IRAs, which increase the after-tax rate of return on saving, will Answer _____

a. either increase or decrease saving depending on whether the rate of time preference is small or large.

b. unambiguously increase saving because the increase in the after-tax rate of return has a larger effect than the zero elasticity of substitution.

c. have offsetting income and substitution effects so that saving is unchanged.

d. unambiguously reduce saving because the substitution effect is zero and the income effect increases consumption.

24. The introduction of a one-time tax increase of $1000 per person (regardless of the amount worked) **next year** will Answer _____

a. have no effect on labor supply in the current year because there is no substitution effect.

b. decrease the amount of labor employed in the current year but increase the real wage rate in the current year.

c. decrease the amount of labor employed in the current year and reduce the real wage rate in the current year.

d. increase the amount of labor employed in the current year and reduce the real wage rate in the current year.

25. In recent years, the United States had _____ net factor payments from abroad and a _____ net international asset position. Answer _____

a. positive; positive

b. positive; negative

c. negative; negative

d. negative; positive

26. The current nominal yield on 10-year nominal Treasury bonds is 1.95% per year and the current real yield on 10-year TIPS is -0.33% per year. Therefore, Answer _____

a. only a foolish investor would hold TIPS.

b. if investors no have aversion to risk or illiquidity, they expect inflation to average about 2.28% per year over the next 10 years.

c. the expected real marginal product of capital is slightly negative.

d. risk-neutral investors expect deflation over the next 10 years.

QUESTION II *(68 points)* Consider the following Keynesian open economy.

Consumption:	C	=	$2740 + 0.6(Y - T) - 1000r$
Investment:	I	=	$1500 - 3500r$
Government purchases:	G	=	3750
Taxes:	T	=	2750
Net exports:	NX	=	$-0.1Y - 500r + 0.1Y_{For} + 1000r_{For}$
Full-employment output:	$\overline{Y}$	=	$15{,}000$
Nominal money supply:	M	=	$48{,}000$
Real money demand:	L	=	$140 + 0.1Y - 4000(r + \pi^e)$
Expected inflation rate:	π^e	=	0
Foreign income:	Y_{For}	=	$12{,}000$
Foreign real interest rate:	r_{For}	=	0.01

[Assume that $NFP = NUT = 0$.]

A. *(5 points)* What is the equation of the *IS* curve?

B. *(26 points)* Suppose that the price level is fixed at $P = 32$ in the short run.

1. *(5 points)* What is the equation of the LM curve in the short run, while the price level remains fixed?

2. *(21 points)* What are the short-run equilibrium values of output, the real interest rate, consumption, investment, net exports, national saving, and velocity?

C. *(16 points)* What are the long-run equilibrium values of output, the real interest rate, consumption, investment, net exports, the price level, national saving, and velocity?

D. *(21 points)* Suppose that the government wants choose values for taxes (T), government purchases (G), and the nominal money supply (M) to reach a long-run equilibrium with (a) $NX = -300$; (b) a government budget deficit, $G - T$, equal to 630; and (c) a price level $P = 31$. This question will guide you through the analysis.

1. *(5 points)* What value of the real interest rate will achieve $NX = -300$ in general equilibrium?

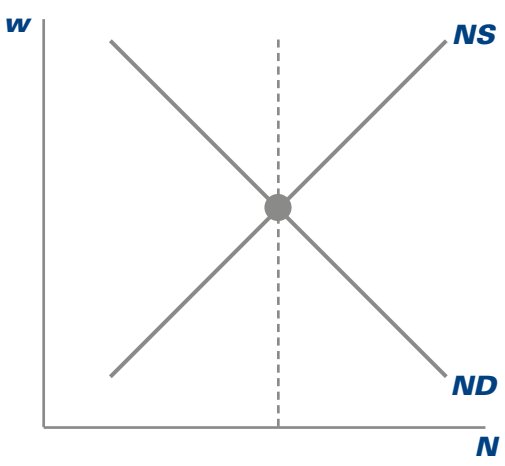
2. *(4 points)* What is the value of $C + G$ in long-run equilibrium with $NX = -300$?

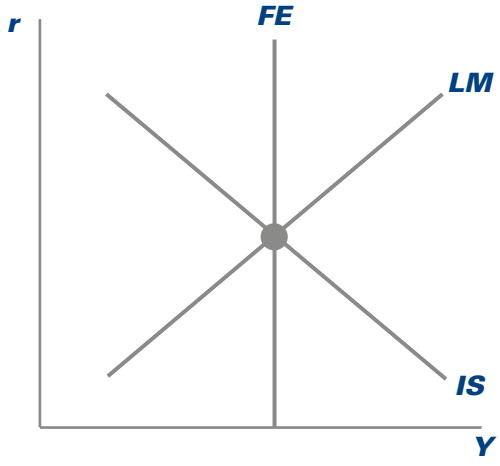
3. *(8 points)* What values of G and T will lead to long-run equilibrium with $NX = -300$ and $G - T = 630$? [Hint: What value of $G = T + 630$ will achieve $C + G$ equal to the value in part D.2?]

4. *(4 points)* What value of the nominal money supply will achieve a long-run equilibrium with $P = 31$ when $NX = -300$ and $G - T = 630$?

QUESTION III. *(44 points)* Consider a classical closed economy that suffers a temporary adverse productivity shock. The government in this economy is committed to adjusting the level of government purchases to maintain employment unchanged. The central bank is committed to maintaining a constant price level.

A. *(12 points)* Using the labor supply/labor demand graph below, (1) show the effect of the temporary adverse productivity shock. BE SURE TO IDENTIFY WHICH CURVE (OR CURVE) SHIFTS AND TO EXPLAIN THE SHIFT; (2) show the effect of the change in government purchases that will maintain employment unchanged. BE SURE TO STATE WHETHER GOVERNMENT PURCHASES INCREASE, DECREASE, OR REMAIN UNCHANGED, AND EXPLAIN WHY ANY CURVES SHIFT IN RESPONSE.





B. *(32 points)* Use the IS/LM diagram shown above to illustrate the effects of the temporary adverse productivity shock, any change in government purchases to maintain constant employment, and any change in the nominal money supply to maintain a constant price level.

1. *(8 points)* In the IS/LM diagram above, illustrate any changes in the *FE* line resulting from the temporary adverse productivity shock and the changes in government purchases and the nominal money supply needed to maintain constant employment and a constant price level. BE SURE TO EXPLAIN ANY SHIFT OF THE FE LINE.

2. *(8 points)* In the IS/LM diagram on the previous page, illustrate any changes in the IS curve resulting from the temporary adverse productivity shock and the changes in government purchases and the nominal money supply needed to maintain constant employment and a constant price level. BE SURE TO EXPLAIN ANY SHIFT OF THE IS CURVE.

3. *(8 points)* In the IS/LM diagram on the previous page, illustrate any change in the LM curve resulting from the temporary adverse productivity shock and the changes in government purchases and the nominal money supply needed to maintain constant employment and a constant price level. BE SURE TO EXPLAIN ANY SHIFT OF THE LM CURVE AND TO EXPLAIN WHY THE NOMINAL SUPPLY INCREASES, REMAINS CONSTANT, OR DECREASES.

4. *(8 points)* If aggregate economic activity is measured by output, is the nominal money supply procyclical, countercyclical, or acyclical? EXPLAIN.

QUESTION IV *(48 points)* The left-side of the table contains data for 12 variables in a closed economy. Fill in the values of the 12 variables on the right-side of the table, being sure to give both the numerical value (in the column headed "number") and the units (in the column headed "units"). If there are no units, indicate "none". The tax function in this economy is $T = t \times Y$, where T is taxes, t is the tax rate on output, and Y is *GDP*. Assume that Okun's Law holds. Also assume that the price level is $P = 1$, so that you don't need to worry about the distinction between real and nominal flows. BE SURE TO SHOW YOUR WORK. [YOU CAN USE THE SPACE AT THE BOTTOM OF THIS PAGE AND THE NEXT PAGE TO SHOW WORK.]

	NUMBER	UNITS		NUMBER	UNITS
Velocity	1.8	Per year	**Reserves**		
Deposits	6500	Billions of dollars	**Money supply**		
Currency	1500	Billions of dollars	**Money multiplier**		
Monetary base	4000	Billions of dollars	**GDP**		
Average product of labor	80	Thousands of dollars per year per worker	**Employment (number of people)**		
Natural rate of unemployment	0.08	(none)	**Unemployment (number of people)**		
Labor force	200	Millions of people	**Unemployment rate**		
Tax rate, *t*	0.2	(none)	**Full-employment GDP**		
Interest payments by government	300	Billions of dollars per year	**Taxes**		
Transfer payments	1200	Billions of dollars per year	**Government purchases**		
Primary deficit	1000	Billions of dollars per year	**Deficit**		
Investment	2500	Billions of dollars per year	**Full-employment deficit**		

Macroeconomics and the Global Economic Environment (FNCE 613)

SAMPLE EXAM 2

NAME

(IN BLOCK LETTERS)

READ THE FOLLOWING DIRECTIONS CAREFULLY.

PLEASE DO NOT TURN THE PAGE UNTIL THE EXAM BEGINS.

1. PRINT your name LEGIBLY IN BLOCK LETTERS at the top of THIS PAGE
2. You will have **90 minutes** to complete this examination. When time is called at the end of the examination, you must **STOP WRITING IMMEDIATELY.**
3. Only short answers are required
4. You can use one double sided sheet of letter-size paper with formulas
5. You may use a calculator, but you may **NOT** use a computer.

QUESTION I *(24 points)*

Argentina pegged its currency against the US dollar since about 1991 until December of 2001. During this period major competitors like Mexico and Brazil devalued their currency substantially.

A. What are the consequences of these devaluations by Brazil and Mexico to Argentina's international competitiveness and to its trade deficit?

B. Illustrate the effect of these devaluations on the IS/LM model. What is the impact on short term GDP and employment in Argentina?

Argentina fell into a recession in 1999 that produced a drop of almost 10% in GDP between late 1998 and the end of 2001. It became increasingly clear that the only alternative to a currency devaluation was a sharp drop in prices and wages.

C. Why would a drop in wages and prices have similar effects to that of a currency devaluation?

Unfortunately given public resistance to significant cuts in wages and public spending foreign investors became increasingly nervous and begun to speculate against the currency.

D. What is the effect of this speculation on Argentina's foreign exchange market and on its short-term interest rates?

E. What is the effect of this lack of confidence by international investors on GDP and employment in Argentina? Show these effects in the IS/LM model.

Suppose Argentina prohibits capital outflows. Formally the central bank suspends the convertibility of its currency into dollars.

F. What is the effect of this policy on their reserve losses and money supply?

QUESTION II *(18 points)*

Suppose a closed economy was operating close to full employment and experiences a sudden collapse in housing prices.

A. Show the corresponding **short run** effects on the IS/LM diagram. What are the short run effects of this sudden drop on:

- **a.** GDP
- **b.** Employment
- **c.** Output gap
- **d.** Real interest rates
- **e.** Prices

B. Show the **long run** effects of persistently low consumer confidence on the same diagram. How does the new **long run** equilibrium compare with the one before the shock in terms of:

- **a.** GDP
- **b.** Employment
- **c.** Output gap
- **d.** Real interest rates
- **e.** Prices

C. What should the Central Bank do to speed up an economic recovery? Starting from the short run equilibrium in part A show the effects of your policy recommendation on the IS/LM diagram. What would be the effects of this policy on:

- **a.** Consumption
- **b.** Investment
- **c.** Interest rates
- **d.** Unemployment rate
- **e.** Potential output

QUESTION III *(24 points)*

Consider an economy characterized by the following equations

$$C = 50 + 0.8(Y - T) - 150r$$
$$I = 100 - 250r$$
$$G = 50$$
$$T = 50$$
$$L = Y - 500r$$
$$M / P = 500$$

Full employment output is 600.

A. What is the equation for the IS curve?

B. What is the equation of the LM curve?

C. What is the equation for the FE line?

D. What is the short run equilibrium level of national income and real interest rates for this economy?

E. What is the long run value of real interest rates?

F. In the long run investment will ____ and consumption will ____ relative to the short-run equilibrium.

G. Converging to the long run equilibrium requires that either prices will ____ or that nominal money supply will ____ .

H. Converging to the long run equilibrium requires that employment will ____ and that the budget deficit will ____.

QUESTION IV *(10 points)*

Consider an economy where the only source of business cycle fluctuations is the foreign sector. No shocks originate in this economy, but shocks in the rest of the world sometimes increase this country's net exports and sometimes decrease this country's net exports.

A. Use an IS-LM diagram to illustrate the short-run effect of an increase in income in the rest of the world that increases this country's net exports. What are the short-run effects on this country's output and real interest rate?

B. Briefly explain whether each of the following variables is procyclical (increases during expansions) or countercyclical (increases in recessions).

Employment:

Real interest rate:

Investment:

Saving:

Trade surplus:

QUESTION V *(12 points)*

Consider the following data regarding the monetary statistics of an economy. The currency-deposit ratio (cu) is 0.6 and the reserve-deposit ratio (res) is 0.2. The monetary base in this country is 400 dollars.

A. What is the value of the money multiplier in this economy?

B. What is the value of the money supply in this economy?

C. What are the values of currency and deposits in this economy?

QUESTION VI *(12 points)*

Over the last decade several countries in Europe have begun to reform their labor markets to increase the labor force participation and employment. For the purposes of this question consider only two specific measures: increasing retirement age and reducing unemployment benefits.

A. Show graphically the effect of an increase in labor force participation on the labor market equilibrium?

B. Show graphically the effect of these policies on the IS/LM/FE diagram

C. What are the long run effects of these policies on Europe's GDP and its international competitivess?

D. What are the long run effects of these policies on the government budget deficits?

Sample Exam 1 Answers FNCE 613

QUESTION I

1. **d**
2. **b**
3. **c**
4. **c**
5. **d**
6. **d**
7. **a**
8. **c**
9. **c**
10. **a**
11. **d**
12. **a**
13. **d**
14. **b**
15. **c**
16. **c**
17. **b**
18. **d**
19. **c**
20. **b**
21. **c**
22. **c**
23. **d**
24. **d**
25. **b**
26. **b**

QUESTION II

A. $Y=C+I+G+NX = [2740 + 0.6(Y - T) - 1000r]+[1500 - 3500r]+3750+[-0.1Y - 500r + 0.1Y_{For} + 1000r_{For}] = [2740 + 0.6(Y - 2750) - 1000r]+[1500 - 3500r]+3750+[-0.1Y - 500r + 0.1(12{,}000) + 1000(0.01)]$, *so* $0.5Y = 7550 - 5000r$. *Therefore,* $\mathbf{Y = 15{,}100 - 10{,}000r}$ *or, equivalently,* $\mathbf{r = 1.51 - 0.0001Y}$.

B. **1.** $(48{,}000)/(32) = M/P = L = 140 + 0.1Y - 4000(r + \pi^e) = 140 + 0.1Y - 4000r$. *Therefore,* $1500 = 140 + 0.1Y - 4000r$, *which implies* $1360 = 0.1Y - 4000r$. *Therefore,* $\mathbf{Y = 13{,}600 + 40{,}000r}$ *or, equivalently,* $\mathbf{r = 0.000025Y - 0.34}$.

B. 2. *IS/LM intersection: 15,100 – 10,000r = Y = 13,600 + 40,000r, which implies 1500 = 50,000r, so* ***r = 0.03****. Substitute r = 0.03 into IS curve: Y = 15,100 – 10,000r = 15,100 – (10,000)(0.03), so* ***Y = 14,800****.*
[check: substitute r = 0.03 into LM curve: Y = 13,600 + 40,000r = 13,600 + (40,000)(0.03) = 14,800.]
Consumption = C = 2740 + 0.6(Y – T) – 1000r = 2740 + 0.6(14,800 – 2750) – (1000)(0.03), so ***C = 9940****.*
Investment = I = 1500 – 3500r = 1500 – (3500)(0.03), so ***I = 1395****.*
Net Exports = NX = – 0.1Y – 500r + 0.1Y_{For} + 1000r_{For} = – 0.1(14,800) – 500(0.03) + 0.1(12,000) + 1000(0.01), so ***NX = -285****.*
[check: 14,800 = Y = C+I+G+NX = 9940 + 1395 + 3750 – 285 = 14,800.]
National Saving = S = Y – C – G = 14,800 – 9940 – 3750, so ***national saving = 1110.***
.
[check: with NFP=NUT = 0, -285 = NX = CA = S – I = 1110 – 1395 = -285.]
Velocity = V = (P)(Y)/M = (32)(14,800)/(48,000), so ***velocity = 9.866667****.*

C. *In long-run equilibrium, Y = $\overline{Y}$, so* ***Y = 15,000****. Substitute Y = 15,000 into the IS curve to obtain r = 1.51 – (0.0001)(15,000), so* ***r = 0.01****.*
Consumption = C = 2740 + 0.6(Y – T) – 1000r = 2740 + 0.6(15,000 – 2750) – (1000)(0.01), so ***C = 10,080****. Investment = I = 1500 – 3500r = 1500 – (3500)(0.01), so* ***I = 1465****.*
Net Exports = NX = – 0.1Y – 500r + 0.1Y_{For} + 1000r_{For} = – (0.1)(15,000) – (500)(0.01) + (0.1)(12,000) + (1000)(0.01), so ***NX = -295****.*
[check: 15,000 = Y = C+I+G+NX = 10,080+1465+3750 –295 = 15,000.]
P = M/L = (48,000)/(140+0.1Y–4000(r + π^e)) = (48,000)/(140 + (0.1)(15,000) – (4000)(0.01 + 0)) = 48,000/1600, so ***P = 30****.*
National saving = S = Y – C – G = 15,000 – 10,080 – 3750, so ***national saving = 1170****.*
[check: with NFP=NUT = 0, -295 = NX = CA = S – I = 1170 – 1465 = -295.]
Velocity = V = (P)(Y)/M = (30)(15,000)/(48,000), so ***velocity = 9.375.***

D. 1. *In general equilibrium, Y = $\overline{Y}$ = 15,000. Find the value of r for which -300 = NX = – 0.1Y – 500r + 0.1Y_{For} + 1000r_{For} = – 0.1(15,000) – 500r + 0.1(12,000) + 1000(0.01) = -290 – 500r, which implies 500r = 10. Therefore,* ***r = 0.02*** *will achieve NX = -300 in long-run equilibrium.*

2. *In long-run equilibrium with NX=-300, r = 0.02 (from part D.1), so I = 1500 – 3500r = 1500 – 3500(0.02) = 1430. Hence, in long-run equilibrium with NX = -300, Y = $\overline{Y}$ = 15,000, and I = 1430, so 15,000 = Y = C + I + G + NX = C + 1430 + G – 300. Therefore,* ***C + G = 13,870*** *in long-run equilibrium with NX = -300.*

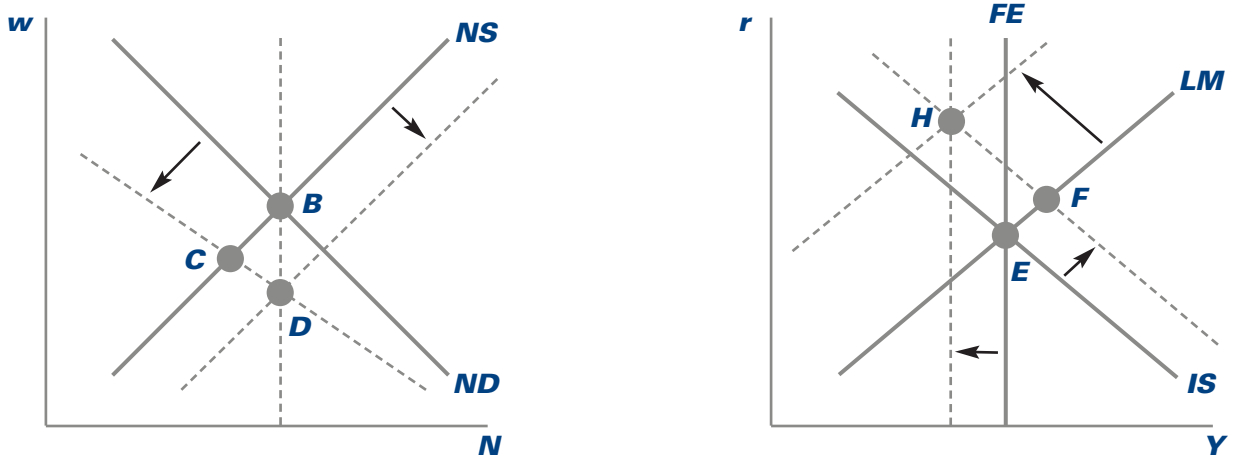
3. *Set Y = $\overline{Y}$ = 15,000, r = 0.02, and G = T + 630 in 13,870 = C + G = (2740 + 0.6(Y – T) – 1000r) + G = (2740 + 0.6(15,000 – T) – 1000(0.02)) + T + 630 to obtain 13,870 = 2740 + 9000 – 0.6T – 20 + T + 630 = 12,350 + 0.4T. Therefore, 1520 = 0.4T, so* ***T = 3800****, and G = T + 630 so* ***G = 4430****.*
[check: C = 2740 + 0.6(15,000 – 3800) – 1000(0.02), so C = 9440. As shown in part D.2, I = 1430. Therefore, NX = Y – (C+I+G) = 15,000 – (9440+1430+4430) = 15,000 – 15,300=-300.]

4. *M = (P)(L) = (31)(140+0.1Y – 4000(r+π^e) = (31)(140 + 0.1(15,000) – 4000(0.02 + 0)) = (31)(1560), so* ***M = 48,360*** *will achieve a short-run equilibrium with P = 31, G – T = 630, and NX = -300.*

QUESTION III.

A. (1) The temporary adverse productivity shock reduces the MPN at every level of employment. Since the labor demand is the MPN curve, the **labor demand curve shifts downward**. The labor supply curve does not change in response to the temporary productivity shock. In the absence of a change in government purchases, the equilibrium moves to point C from point B.

(2) An **increase in government purchases** will make workers poorer (because of an increase in current or future taxes) and hence workers can afford less leisure and will supply more labor, shifting the labor supply to the right, until it passes through point D, with the same level of employment as in the original equilibrium at point B.



B. **1.** *The FE line is a vertical line at $Y = \bar{Y} = A \times F(K, \bar{N})$. The temporary adverse productivity shock is a reduction in A. In the absence of a change in G, equilibrium in the labor market would move to point C, with a decline in employment. However, government purchases are increased to maintain $\bar{N}$ unchanged. So, with $\bar{N}$ unchanged, the fall in A implies that $\bar{Y}$ falls and hence the FE line shifts to the left.*

2. The increase in government purchases causes the IS curve to shift upward and to the right (an increase in government purchases causes an excess demand for goods at the initial values of Y and r, and this excess demand for goods can be eliminated by an increase in Y and/or an increase in r, so the IS curve shifts upward). Neither the temporary productivity shock nor any change in the nominal money supply directly shifts the IS curve.

3. The upward shift of the IS curve moves the IS/LM intersection to point F, which is to the right of the new FE line. Therefore, output at the new IS/LM intersection is higher than the new full-employment level of output, which puts upward on prices. If the nominal money supply were to remain unchanged, the price level would increase, reducing the real money supply M/P, and shifting the LM curve upward until it passes through the FE/IS intersection at point H. To prevent the price level from rising, **the central bank can reduce the nominal money supply,** which reduces the real money for a given price level, thereby shifting the LM curve upward until it passes through point H.

4. In response to a temporary adverse productivity shock, the economy moves from point E to point H in the IS/LM diagram, so output falls, which means that aggregate economic activity falls, i.e. the economy goes into a recession. As explained in part B.3, the nominal money supply falls in order to keep the price level from rising. Since the nominal money supply falls during recessions, **the nominal money supply is procyclical.**

QUESTION IV

	NUMBER	UNITS		NUMBER	UNITS
Velocity	1.8	Per year	**Reserves**	2500	Billions of dollars
Deposits	6500	Billions of dollars	**Money supply**	8000	Billions of dollars
Currency	1500	Billions of dollars	**Money multiplier**	2	None
Monetary base	4000	Billions of dollars	**GDP**	14,400	Billions of dollars per year
Average product of labor	80	Thousands of dollars per year per worker	**Employment (number of people)**	180	Millions of people
Natural rate of unemployment	0.08	(none)	**Unemployment (number of people)**	20	Millions of people
Labor force	200	Millions of people	**Unemployment rate**	0.10	None
Tax rate, *t*	0.2	(none)	**Full-employment GDP**	15,000	Billions of dollars per year
Interest payments by government	300	Billions of dollars per year	**Taxes**	2880	Billions of dollars per year
Transfer payments	1200	Billions of dollars per year	**Government purchases**	2680	Billions of dollars per year
Primary deficit	1000	Billions of dollars per year	**Deficit**	1300	Billions of dollars per year
Investment	2500	Billions of dollars per year	**Full-employment deficit**	1180	Billions of dollars per year

Monetary base = currency plus reserves, so reserves = monetary base – currency = 4000 billions of dollars = 1500 billions of dollars. Therefore, **reserves = 2500 billions of dollars.**

Money supply = M = currency + deposits = 1500 billions of dollars + 6500 billions of dollars, so **M = 8000 billions of dollars.**

Money multiplier = (money supply)/(monetary base) = (8000 billions of dollars)/(4000 billions of dollars), so **money multiplier = 2.**

Velocity = GDP/M, so GDP = (velocity)(M) = (1.8 per year)(8000 billions of dollars). Therefore, **GDP = 14,400 billions of dollars per year.**

APL = average product of labor = GDP/E, where E is number of people employed, so E = GDP/APL = (14,400 billions of dollars per year)/(80 thousands of dollars per year per worker). Therefore, **employment = 180 millions of workers.**

U = LF – E = 200 millions of people – 180 millions of people, so **unemployment = 20 millions of people.**

Unemployment rate = u = U/LF = (20 millions of people)/(200 millions of people) = 0.10.

Okun's Law: $(\bar{Y} - Y)/\bar{Y} = 2(u - \bar{u})$, *so* $1 - \frac{Y}{\bar{Y}} = 2(u - \bar{u})$, *which implies* $\bar{Y} = \frac{Y}{1-2(u-\bar{u})} = \frac{14{,}400 \text{ billions of dollars per year}}{1-2(0.10-0.08)}$. *Therefore,* $\boldsymbol{\bar{Y} = 15{,}000 \text{ billions of dollars per year}}$.

Taxes = t × Y = (0.2)(14,400 billions of dollars per year) so **Taxes = 2880 billions of dollars per year.**

Primary deficit = G + TR – T, so G = primary deficit – TR + T = 1000 billions of dollars per year – 1200 billions of dollars per year + 2880 billions of dollars per year. Therefore, **G = 2680 billions of dollars per year.**

Deficit = primary deficit + interest payments by government = 1000 billions of dollars per year + 300 billions of dollars per year. Therefore, **deficit = 1300 billions of dollars per year.**

Full-employment deficit = G + TR + INT – t × (Full-employment GDP) = 2680 billions of dollars per year + 1200 billions of dollars per year + 300 billions of dollars per year – (0.2)(15,000 billions of dollars per year), so **full-employment deficit = 1180 billions of dollars per year.**

Sample Exam 2 Answers FNCE 613

QUESTION I

A. Argentina's exports become less competitive as the real exchange rate appreciates. This increases the country's trade deficit.

B. The IS curve shifts down and to the left. This reduces output and employment.

C. Essentially because it would make Argentina more competitive and boost its net exports. In either case the IS curve would shift up.

D. The speculation lowers the reserves of the central bank and the money supply. This will push up short term interest rates.

E. The contraction in the money supply will shift the LM curve up and pushes up short term interest rates. The speculation makes the recession worst by further reducing employment and GDP.

F. This reduces or eliminates sales of the domestic currency and eliminates the loss of reserves by the central bank. The money supply stops falling and the LM curve no longer shifts up.

QUESTION II *(18 points)*

A. **a.** GDP Falls
- **b.** Employment Falls
- **c.** Output gap Rises
- **d.** Real interest rates Fall
- **e.** Prices No Change

B. **a.** GDP Same
- **b.** Employment Same
- **c.** Output gap Same
- **d.** Real interest rates Lower
- **e.** Prices Lower

C. **a.** Consumption Rises
- **b.** Investment Rises
- **c.** Interest rates Fall
- **d.** Unemployment rate Falls
- **e.** Potential output None

QUESTION III

A. C+I+G=Y
0.2Y = 160 – 400r

B. M/P = L
500 = Y – 500r

C. Y = 600

D. In the short run we look at the intersection of the IS and LM curves only.
Y = 560, r = 12%

E. We know output is at FE = 600.
In the long run the LM curve shifts as necessary to meet the IS curve where this curve crosses FE.
So we just compute the interest rate by plugging Y=600 in the IS curve.
r = 10%

F. Rise; Rise
Since interest rates fall this will increase consumption and investment.

G. Fall; Rise
The LM curve must shift down, which implies real money supply (M/P) will rise.

H. Rise; Fall
Output increases so employment must also increase. This will also raise tax revenues and lower any budget deficit.

QUESTION IV

A. The increase in this country's net exports causes the IS curve to shift up and to the right in this country. In the short run, output and the real interest rate both increase.

B. Employment: procyclical
Real interest rate: procyclical
Investment: countercyclical
Saving: procyclical
Trade surplus: procyclical

The IS-LM diagram shows that output (Y) and the real interest rate (r) both increase so the real interest rate is procyclical.

In order for output to increase, firms must use more labor so employment increases, and thus is procyclical. The increase in r implies that investment falls and thus is countercyclical.

Since interest rates and income go up in expansions so does private (and national) saving.

The increase in net exports was the original source of our expansion, so the trade surplus is procyclical.

QUESTION V

A. mm = (1+cu)/(res+cu) = (1+0.6)/(0.2+0.6) = 1.6/0.8 = 2.

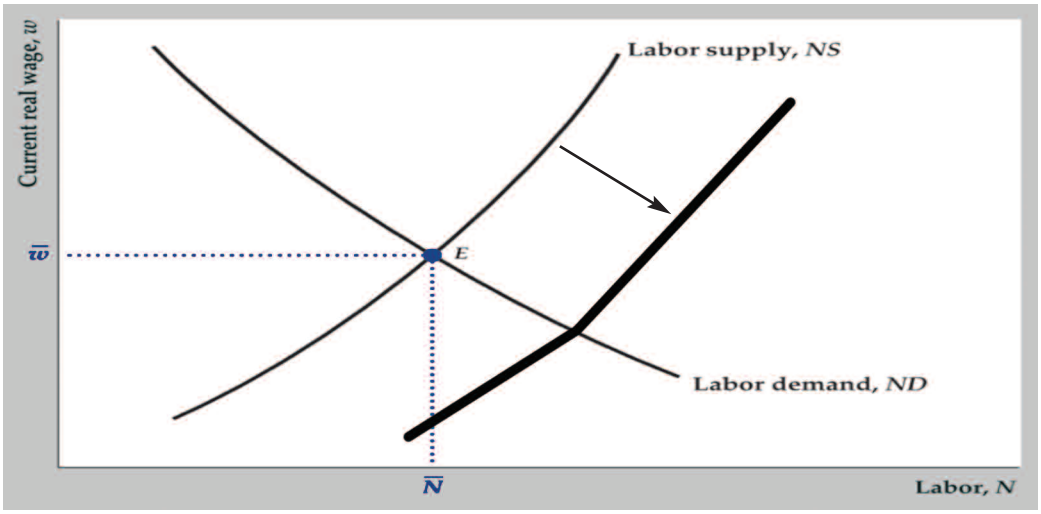
B. M = (mm)Base = 2(400 dollars) = 800 dollars.

C. M = CU + DEP. Dividing both sides of this equation by DEP yields M/DEP = cu + 1 which implies DEP = M/(cu+1) = (800 dollars)/(0.6+1). Therefore, DEP = 500 dollars. CU = (cu)(DEP) = 0.6(500 dollars) = 300 dollars.
[check: CU + DEP = 300 dollars + 500 dollars = 800 dollars = M.]

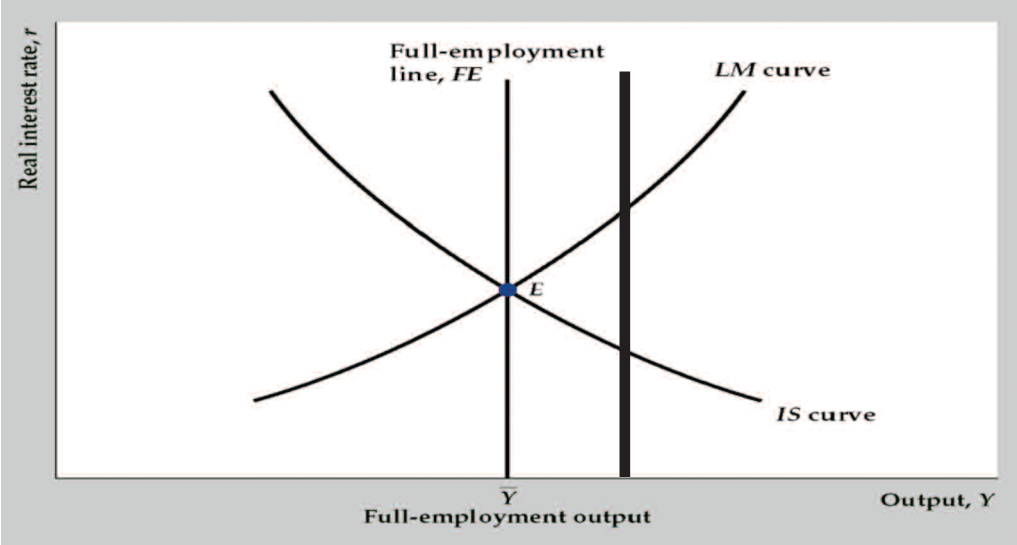
QUESTION VI

Over the last decade several countries in Europe have begun to reform their labor markets to increase the labor force participation and employment. For the purposes of this question consider only two specific measures: increasing retirement age and reducing unemployment benefits.

A. The labor supply curve shifts down and to the right. This increases the equilibrium level of employment – the "full employment."



B. An increase in full employment increases potential GDP. The FE line shifts to the right.



Note: To reach the new long run equilibrium prices will have to fall.

C. A reduction in wages and prices will make exports cheaper and improve competitiveness. Long run GDP will be higher as we have seen above.

D. Government spending on these programs will fall.
In the long run tax revenues will also increase since national income increases.
Together they imply a lower budget deficit.

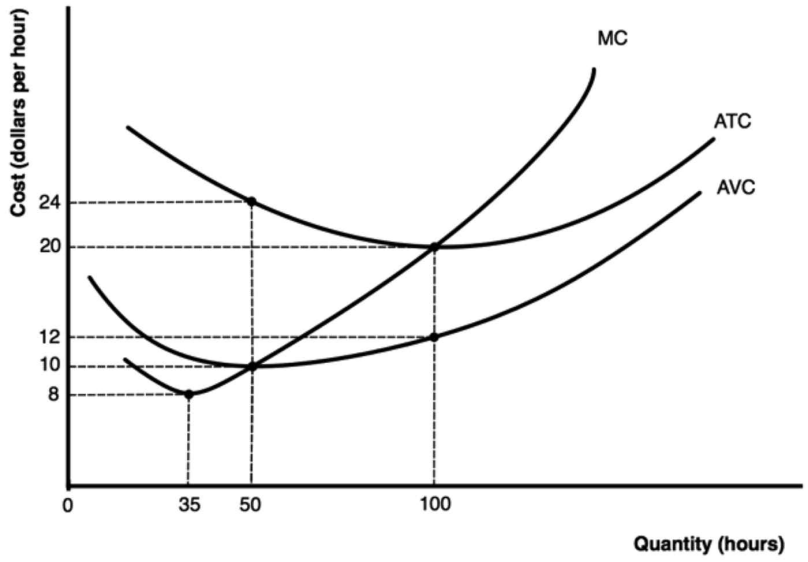
Economics of Managerial Decision Making (MGEC 611)

SAMPLE EXAM

QUESTION 1

Short Questions. This part consists of three short, stand-alone questions of lower math intensity. Please provide an answer or check the box corresponding to the correct answer (you are not required to show supporting work for this section).

A. **Cleaning Service.** Center City Cleaners offers office-cleaning services. Their costs (in dollars per hour) can be summarized by the graphs below. Assume that the market for office cleaning in Center City is perfectly competitive (therefore anyone can enter).



i. What is the lowest price above which Center City cleaners make a profit?

Price: _____

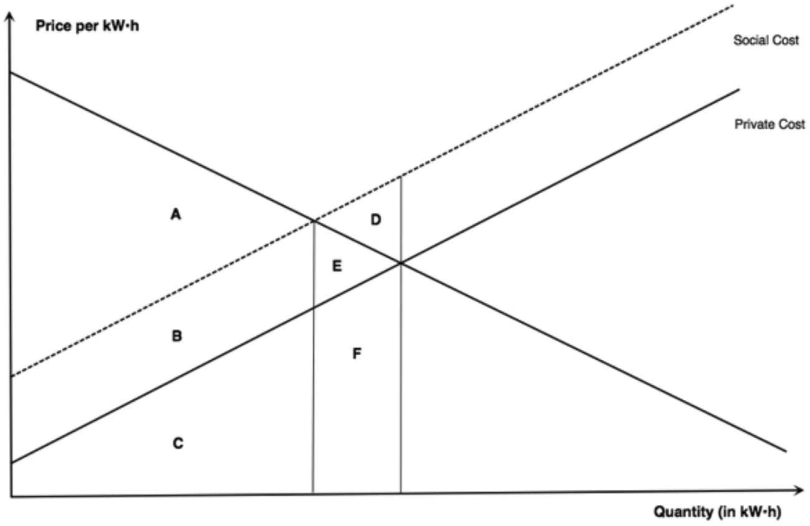
ii. Between which two prices per hour would Center City Cleaners continue to produce in the short run, but shut down once there are no longer any fixed costs?

Prices: _____ and _____

iii. Below which price per hour would Center City Cleaners shut down even in the short run?

Price: _____

B. **Electricity.** A recent government study finds that the production of electricity causes a negative externality of $0.10 per kilowatt hour (increased levels of acid rain reduce public health and destroy local crops). This is depicted in the graph below.



i. In general, if a good imposes a negative externality on society, _____ will be produced in the absence of intervention. If a good imposes a positive externality on society, _____ will be produced in the absence of intervention.

- Too much; too much _____
- Too much; too little _____
- Too little; too much _____
- Too little; too little _____

ii. Write the social welfare (or surplus) generated by this market with no intervention in terms of the labeled regions on the graph above (For example, A+B):

Social Welfare: _____

iii. What would be the optimal tax per kilowatt hour for the government to levy?

Tax: _____

iv. Write the social welfare (or surplus) generated by this market if the optimal tax were levied in terms of the labeled regions.

Social Welfare: _____

C. Auctions

i. For each of the following auction types, indicate whether someone making an optimal bid decides to "shade" (i.e. bid lower than their perceived valuation).

Private Value Second-price Sealed Bid Auction

_____ Shade

_____ Don't Shade

Common Value Second-price Sealed Bid Auction

_____ Shade

_____ Don't Shade

ii. If an auctioneer is choosing a format for a sealed-bid auction, and the same number of bidders will enter no matter the format, which one will have higher expected revenue?

_____ First price

_____ Second price

_____ They will be the same

iii. You are entering a first-priced, sealed bid auction for pay-per-click advertising. You have some estimates on the probability of winning at each bid (represented as a payment per click) based on past auctions. You value each click at $0.70. Use the table below to select the optimal bid.

Optimal?	Bid (per click payment)	Probability of winning
_____	$0.75	100%
_____	$0.70	90%
_____	$0.65	70%
_____	$0.55	40%
_____	$0.50	10%
_____	$0.45	0%

QUESTION 2

Apple watch. Apple has recently introduced a new marquee product, the Apple Watch. Before they launched, they used focus groups with beta testers to estimate a demand curve, in order to decide on pricing. They estimated daily market demand for the Apple watch as:

$$P = 900 - \frac{1}{2}q$$

Apple's total cost to produce q units of Apple watch is:

$$TC\ (q) = 108q + 0.1q^2$$

A. What price should Apple set to maximize profits?

Price: $P =$ _____

B. What is the profit that Apple will earn at this price?

Profit: _____

C. What is the consumer surplus created at this price?

Consumer Surplus: _____

Remember that Apple had estimated its demand curve from beta tester reports. Now, it wants to do a potentially more accurate job using real data. So, Apple sends 5% off coupons to a randomly selected group of potential customers and finds that it sells 15% more units of Apple watch to customers who get the discount.

D. Using this experiment, what is the own-price elasticity of demand for the Apple Watch?

Elasticity of Demand: _____

E. Assume that the coupon experiment represents a more accurate picture of demand than the beta tester reports. What should Apple do with the price charged in Part A?

_____ DO NOT CHANGE

_____ RAISE

_____ LOWER

Why?

QUESTION 3

New Release. Paramount Studios has struck a deal with Netflix to allow the streaming service to show its new movie line-up through a "New Release" channel. "New Release" would be available as a premium subscription service, where Paramount would license the content to Netflix, and Netflix would resell it to customers at a price of p dollars per subscriber per month. Beyond payment to Paramount for the content, Netflix does not incur any additional distribution costs. Additionally, Paramount's marginal cost for providing the movies to Netflix is zero, as in this case the movies are already made and streaming-ready.

The companies agree that the monthly market demand for the "New Release" channel is:

$$q^D(p) = 15 - \frac{1}{3}p$$

where q is in millions of subscribers.

Under one possible payment structure, Paramount would license its content to Netflix for a monthly charge, called a "carriage charge," of c dollars per subscriber per month.

A. In terms of the carriage charge c, what is Netflix's profit maximizing number of subscribers and price for "New Release"?

Subscribers: _____

Price: _____

B. What is Paramount's optimal per-subscriber carriage charge? How much profit will Paramount make from "New Release" per month?

Carriage Charge: _____

Profit: _____

C. Given the carriage charge set by Paramount in B., what price will Netflix charge customers for "New Release"? How much profit does Netflix earn per month?

Price: _____

Profit: _____

Instead, Paramount decides that it would only be willing to sell content to "New Release" if Netflix pays a flat monthly fee, F (independent of the number of subscribers) and a per-subscriber carriage charge, c.

D. How should Paramount set c to maximize joint profit, and what will be the total profit between both companies?

Optimal carriage charge c: _____

Profit: _____

E. What is the range of possible values of F, the fee paid by Netflix to Paramount, where both Netflix and Paramount would be willing to sign on to this new pricing scheme, and launch "New Release"?

_____ > F > _____

QUESTION 4

T-shirts. Everlane has cut through the middleman by taking t-shirts direct from factories to consumers. These t-shirt factories produce t-shirts using labor (L) and fabric (F). At a particular factory, a new technique of cutting fabric allows for less fabric waste if more labor is put in. Combining L units of labor and F units of fabric produces t-shirts according to the following production function.

$$q = f(L,F) = 4 * L^{0.5} F^{0.5}$$

L costs \$80/unit while F costs \$20/unit.

A. Compute the marginal productivity of labor and fabric.

MP_L = _____

MP_F = _____

B. If this factory produces optimally, how many units of F should be used for every unit of L?

C. Suppose the manager of this factory wants to product q t-shirts. How many units of L and F should be used?

(Note that both of these answers should be in terms of q)

L = _____

F = _____

In general, the market for t-shirts is perfectly competitive with a large number of small factories each operating with a variable cost of

$$VC(q) = 0.25 * q^2$$

for producing q t-shirts. Throughout, let p denote the price per t-shirt.

D. In this perfectly competitive environment, at a given price p, how many t-shirts would a factory optimally choose to produce?

q^* = _____

This is the factory's supply curve, $q^S(p)$.

Assuming that there are 100 such factories (all with identical cost structures) in the market, what is the market supply of t-shirts, Q^S (p)?

Market supply curve: $Q =$ _____

Daily demand for t-shirts in the market is given by:

$$Q^D(p) = 12{,}000 - 2{,}200p$$

E. What is the equilibrium price and daily quantity of t-shirts sold?

Equilibrium price: _____

Quantity: _____

Let's say all t-shirts are currently produced in China, but many manufacturers are considering leaving for Vietnam, due to cheaper labor costs. As a result, the Chinese government offers a subsidy *(a negative tax)* of $ 0.60 per t-shirt produced domestically.

F. Find an individual factory's supply curve once the subsidy takes effect. Then find the total market supply curve under the subsidy program.

Firm supply curve: $q =$ _____

Market supply curve: $Q =$ _____

What would the equilibrium price and daily quantity of t-shirts sold be now?

Equilibrium price: _____

Quantity: _____

QUESTION 5

Rock Band. A famous rock band is getting back together for a one-night-only event. They are allowing two local theaters, Roxy Theater and Rave Cinemas, to simulcast the performance.

The owners of both theaters estimate the market for simulcast concert tickets is a total of 1,000 people in the town. Each theater can seat at most 800 people and wants to maximize revenue (they've each already paid to simulcast the performance and have zero marginal costs, so maximizing revenue is maximizing profit).

The two theaters both have to announce their prices simultaneously on Ticketmaster on the same day. The pricing structure of both theaters only allows them to charge either $18, the regular ticket price, or $20, the special event price.

If they charge the same price, 500 people will see the performance at each theater. If they charge different prices, 800 will go to the cheaper theater, and the remaining 200 will go to the more expensive one.

A. Draw a game board for the two theaters (Roxy and Rave).

B. Do theaters have dominant strategies?

_____ No

_____ Yes

If yes, the dominant strategies are:

Find all the Nash Equilibria of the game.

Nash Equilibria: _____

In a surprise announcement, the band announces they will simulcast four more concerts over the next four months, and then they will definitely retire the simulcast program. Again, both theaters expect 1,000 fans each month.

C. What price per ticket do the theaters charge for the performance in each month if they play the Nash Equilibrium strategy suggested by game theory?

Month 1: _____

Month 2: _____

Month 3: _____

Month 4: _____

Now, in an even bigger surprise announcement, the artists announce that they plan to simulcast one new special performance each month from now on (i.e. indefinitely), starting today. As before, if the theaters charge the same price, 500 people will see the performance at each theater; if they charge different prices, 800 will go to the cheaper theater and the remaining 200 will go to the more expensive one. Both theaters discount future revenue at a monthly rate equal to δ (Meaning, \$1 received one month from now is worth $\$1/(1+\delta)$ today. Assume that revenue from ticket sales is received at the beginning of each month.)

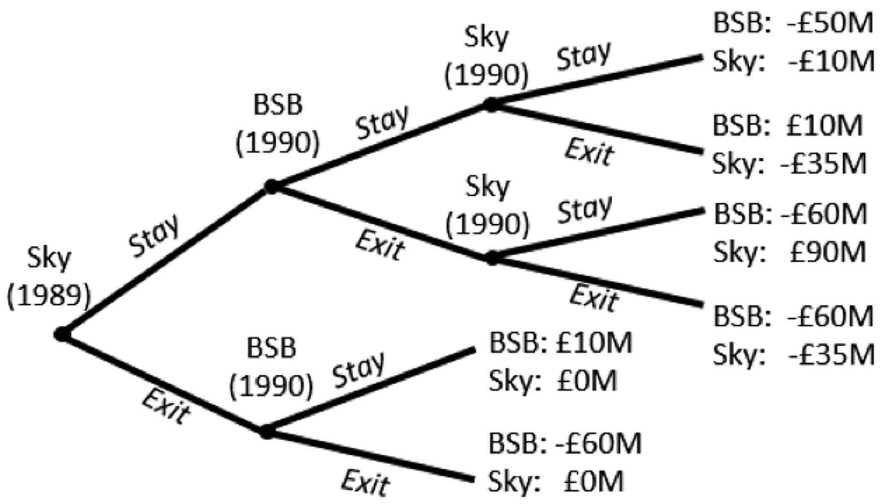
D. What is each theater's present value from always choosing the special event price (i.e. \$20) forever?

E. What is the largest value of the discount rate δ such that "grim" trigger strategies can be used to sustain a Nash Equilibrium in which the theaters charge the larger price \$20 rather than the lower price of \$18?

δ = _____

QUESTION 6

British Broadcasting. In 1988, British Satellite Broadcasting (BSB) saw untapped potential in the UK TV market and entered with a strategy that centered on a high-tech infrastructure. Unfortunately for BSB, Rupert Murdoch's media company, Sky Television, surprised BSB by considering its own entry with a less known, lower cost and lower quality satellite technology. We can model this with a sequential game in which Sky chooses to enter in 1989, BSB decides whether to exit in 1990, and then Sky decides whether to stay and fight if BSB does not exit. Payoffs are shown in the game tree below:



A. What are the equilibrium decisions of this game?
Sky: _____ STAY in '89, STAY in '90 _____STAY in '89, EXIT in '90 _____EXIT in '89
BSB:_____ STAY in '90 _____ EXIT in '90

B. As a game-changing move, Sky is considering paying BSB to choose "exit". How much would Sky have to pay to BSB for them to be willing to choose "exit" in 1990?

Sky would have to pay: _____

70M makes them exactly indifferent, so depending on what students assume (implicitly) the correct answer can range from 70M to 71M since any value in between will break the indifference.

C. By how much would Sky's profit change from original outcome if it chose to pursue the buyout strategy from the previous part?
Sky's profit changes by: _____

EPILOGUE: Sky bought BSB in 1990 and sold it for scrap, but called the arrangement a "merger". This is the origin of the current British television operator BSkyB.

Sample Exam Answers MGEC 611

QUESTION 1

A. **i.** 20
ii. 10 and 20
iii. 10

B. **i.** Too much; too little
ii. A-D
iii. $0.10
iv. A

C. **i.** Private Value Second-price Sealed Bid Auction: Don't Shade
Common Value Second-price Sealed Bid Auction: Shade
ii. They will be the same
iii. $0.55 40%

QUESTION 2

A. 570

The revenue function is

$R(q) = p(q) * q = (900 - 0.5q)q$

Take derivative w.r.t. q and MR is:

$MR(q) = 900 - q$

Take derivative of TC w.r.t. q and MC is:

$MC(q) = 108 + 0.2q$

At optimal q^*, $MR(q^*) = MC(q^*)$, so we get

The equilibrium price is

$900 - q^* = 108 + 0.2q^*$

$q^* = 660$

$p^* = 900 - 0.5 * 660 = 570$

B. 261,360

$\Pi^* = R(q^*) - TC(q^*) = 570 * 660 - (108 * 660 + 0.1 * 660^2) = 261{,}360$

C. 108,900

CS = 0.5 * q^* * (demand's price intercept − p^*)

$= 0.5 * 660 * (900 - 570) = 108,900$

D. -3

$\varepsilon_d = {}^{q\%}/_{p\%} = -{}^{15}/_{5} = -3$

E. LOWER
To make the inverse elasticity pricing rule hold—right now markup is higher than the inverse elasticity, so markup should be lowered by lowering price

QUESTION 3

A. *Subscribers:* $^{(45-c)}/_{6}$
Price: $^{(45+c)}/_{6}$

Netflix profit function
$\Pi_N = (p - c)q(p) = (p - c)(15 - {}^{1}/_{3p})$ Take derivative w.r.t. p and set to 0:
The demand is:
$p^*(c) = {}^{(45-c)}/_{2}$
$q^*(c) = 15 - {}^{1}/_{3p^*(c)} = {}^{(45-c)}/_{6}$

Plug $p^*(c)$ and $q^*(c)$ back into the profit function: $\Pi_N(c) = {}^{(45-c)^2}/_{12}$

B. *Carriage Charge:* 22.5
Profit: 84.375

Paramount profit function: $\Pi_P = cq\,(c) = {}^{c(45-c)}/_{6}$
Use the FOC: $c^* = 22.5$
Then, $q^* = q^*(c = 22.5) = 3.75$
The profit is: $\Pi_P^* = 22.5 * 3.75 = 84.375$

C. Price: 33.75
Profit: 42.1875

$p^* = p^*(c = 22.5) = {}^{(45+22.5)}/_{2} = 33.75$
$\Pi^*_N = \Pi_N(c = 22.5) = {}^{(45 - 22.5)^2}/_{12} = 42.1875$

D. *Optimal carriage charge c*: 0
Profit: 168.75

The joint profit is maximized by setting the carriage charge to Paramount's MC which is 0.
Plug c = 0 into Netflix profit function:
$\Pi_N(c = 0) = {}^{45^2}/_{12} = 168.75$
So Netflix earns 168.75 − F, and Paramount earns F. The total profit is 168.75.

E. $126.5625 > F > 84.375$
Netflix agrees if $168.75 - F \geq 42.1875$, so $F \leq 126.5625$. Paramount agrees if $F \geq 84.375$.

QUESTION 4

A. $MP_L = 2L^{-0.5}F^{0.5}$
$MP_F = 2L^{0.5}F^{-0.5}$

B. 4
$2L^{-0.5}F^{0.5} / 80 = 2L^{0.5}F^{-0.5} / 20$
$F = 4L$

C. $L = 9/8$
$F = 9/2$

$q = 4L^{0.5}(4L)^{0.5} = 8L$
$L = 9/8$
$F = 4L = 9/2$

D. $q^* = 2p$

$MC(q) = d/dq\,(VC) = 0.5q$
A competitive firm chooses quantity such that $p = MC(q)$: $p = 0.5q$
$q^S(p) = 2p$

E. *Equilibrium price:* 5
Quantity: 1,000

$Q^S(p) = Q^D(p)$
$200p = 12,000 - 2,200p$
$p^* = 5$
So the equilibrium quantity is :
$Q^* = 200 * 5 = 1,000$

F. *Firm supply curve:* $q = 2p + 1.2$
Market supply curve: $Q = 200p + 120$

Each firm's marginal cost is reduced by the subsidy amount:
$MC(q) = 0.5q - 0.6$
Again, using $p = MC(q)$,
$p = 0.5q - 0.6$
$q^S(p) = 2p + 1.2$
The market supply is:
$Q^S(p) = 100q^S(p) = 200p + 120$

Equilibrium price: 4.95
Quantity: 1,110

The equilibrium price is:

$Q^S(p) = Q^D(p)$

$200p + 120 = 12{,}000 - 2{,}200p$

$p^* = 4.95$

The equilibrium quantity is:

$Q^* = 200 * 4.95 + 120 = 1{,}110$

QUESTION 5

A.

		Roxy	
		18	20
Rave	18	9,000 ; 9,000	14,000 ; 4,000
	20	4,000 ; 14,400	10,000 ; 10,000

If both price at 18, then each earns $18 * 500 = 9000$. If posted prices differ, the one with 18 earns $18 * 800 = 14400$, and the one with 20 earns $20 * 200 = 4000$. If both price at 20, then each earns $20 * 500 = 10000$.

B. Yes
If yes, the dominant strategies are: (18,18)
Nash Equilibria: 18,18

C. Month 1: 18,18
Month 2: 18,18
Month 3: 18,18
Month 4: 18,18

D. $10{,}000 * {}^{(1+\delta)}/_{\delta}$

E. $\delta = {}^{5}/_{22} = 0.2273$

$10{,}000 * {}^{(1+\delta)}/_{\delta} \geq 14{,}400 + 9{,}000 * {}^{1}/_{\delta}$
$\delta \leq {}^{10{,}000}/_{4{,}400} = {}^{5}/_{22}$

QUESTION 6

A. What are the equilibrium decisions of this game?
Sky: EXIT in '89
BSB: STAY in '90

B. Sky would have to pay: 70M (or 70.01 or 71M, etc)

C. Sky's profit changes by: 20 (19.99 or 19M etc.)

Regression Analysis for Business (STAT 613)

SAMPLE EXAM

■ Instructions

Read these instructions carefully.

Questions 1-20 of this exam are used to place into STAT 621.
Questions 1-43 are used to waive STAT completely.

This is a **closed-book** exam. You are allowed to use a calculator and one page (8.5 by 11 inches or A4, both sides) of **handwritten** notes. No use of cellular telephones or other portable electronics is permitted.

You have **two hours** for the exam. There are **43** questions. The **computer output** associated with one or more questions should be considered an essential part of the questions. The multiple-choice questions are **equally weighted**; the number of correct answers determines your grade.

Throughout this exam, the word "significant" implies "statistically significant" and by "sample" we mean a simple random sample. Use 95% confidence intervals and a p-value threshold of 0.05 to determine statistical significance unless otherwise instructed. All logarithms are natural logs (that is, *ln* or $\log_e$) unless otherwise noted.

All categorical predictor variables have been coded according to a dummy variable coding scheme with the reference category being the level of the variable that is last, using an alphanumeric sort.

Please note the following when filling in the answer form:

- Mark the answer form only using a **pencil**. Erase changes completely.
- **Fill in your name and student id number** on the answer form.
- **Mark the "bubbles"** under your name and student id number.
- Choose the **one best** answer by marking the item on the answer form.

When you have completed the exam, turn in the answer form and your exam with your name on it. Solutions will be posted in Canvas.

■ STOP

Do NOT turn the page until you are instructed to proceed.

1. The amount spent by a customer is normally distributed with mean μ = \$300 and σ = \$50. The probability that a randomly selected customer spends less than \$200 is approximately

- **a.** 0.167
- **b.** 0.334
- **c.** 0.050
- **d.** 0.025
- **e.** 0.010

2. You toss a fair coin repeatedly. Of the following, which has the highest probability of getting exactly 50% heads.

- **a.** Toss it once
- **b.** Toss it 10 times
- **c.** Toss it 100 times
- **d.** Toss it 1000 times.
- **e.** Toss it 1,000,000 times.

3. The IQs of a large population is Normally distributed with a mean of 100 and an SD of 15 points. Suppose you randomly choose 40 people from the population. What is the approximate chance that you get at least one person with an IQ of 130 or higher?

- **a.** .025
- **b.** .33
- **c.** .36
- **d.** .5
- **e.** .64

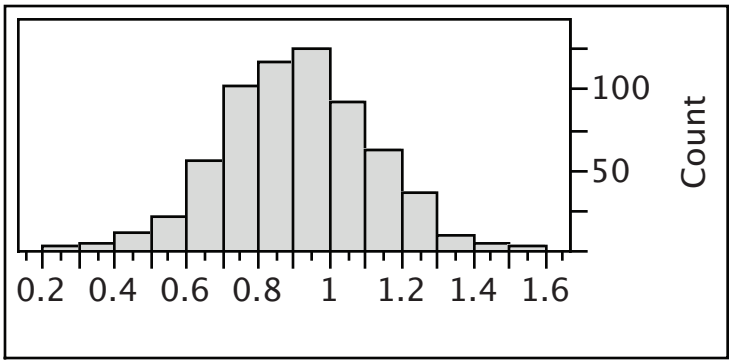
4. The standard deviation in a population of incomes is σ = \$20,000. To obtain a 95% confidence interval for μ with total width (width = upper endpoint – lower endpoint) less than \$500 requires a sample size of about

- **a.** 5,000
- **b.** 100
- **c.** 50
- **d.** 2,000
- **e.** More than 25,000

5. The standard error of the mean

- **a.** Estimates the SD of the population.
- **b.** Increases with the size of a sample.
- **c.** Measures the sample-to-sample standard deviation of sample means.
- **d.** Determines the sample size needed in order to apply the central limit theorem.
- **e.** Is the expected size of the deviation of $\bar{x}$-bar from μ.

QUESTIONS 6–7



6. Consider the histogram shown immediately above this question. Based on this histogram, it is evident that

- **a.** The population mean $\mu \leq 0$.
- **b.** The sample size is less than 200.
- **c.** The 95% confidence interval for the mean includes 0.
- **d.** The sample is too small to produce a normally distributed sampling distribution.
- **e.** The sample mean is about the same as the sample median.

7. Refer again to the histogram shown before Question 6. The standard deviation of these data is approximately

- **a.** 0.01
- **b.** 0.2
- **c.** 2.0
- **d.** 0.05
- **e.** 1.0

QUESTIONS 8–10

A retail web site gathered data about customers who bought either a camera or a phone (but not both). Within this population, 40% of the customers bought a camera. Of those customers who bought cameras, 25% reported incomes less than $50,000. Among those who bought a mobile phone, 50% reported incomes less than $50,000.

8. These results show that the proportion of this population of customers who have incomes of at least $50,000 is

a. 0.50

b. 0.40

c. 0.25

d. 0.60

e. 0.35

9. The web site profits $10 for each camera and $5 for each mobile phone sold. The expected value of the profit produced by the purchase choice of a randomly selected customer from this population is

a. $5

b. $8

c. $6

d. $7

e. $9

10. The probability that a randomly chosen customer from this population who has income above $50,000 buys a phone is

a. 0.25

b. 0.40

c. 0.50

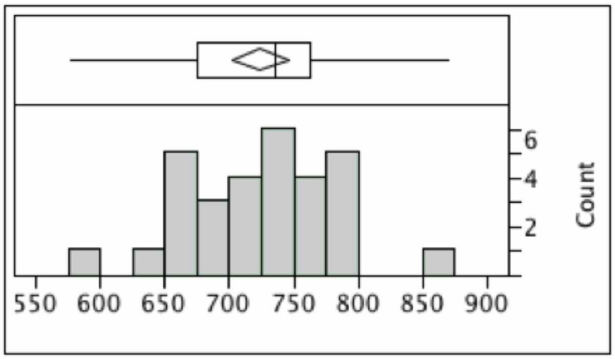
d. 0.60

e. 0.35

QUESTIONS 11–16

An agricultural corporation grows wheat on 10,000 acres. To estimate the total harvest, the corporation measures the yield (in kilograms per acre, kg/acre) just prior to harvest on a sample of 30 one-acre, non-overlapping tracts randomly located over this land.

WHEAT (KG/ACRE)



100.0%	maximum	870	Mean	724.133
75.0%	quartile	763	Std Dev	60.146
50.0%	median	741		
25.0%	quartile	675	N	30
0.0%	minimum	576		

11. These data imply that the probability of observing a tract selected at random from this population with yield less than 741 kg/acres is

- **a.** About 25%.
- **b.** About 50%.
- **c.** About 50%, provided the population is normally distributed.
- **d.** About 95%.
- **e.** Less than 50%.

12. Had the corporation gathered a larger sample of 100 tracts, then we should expect to find

- **a.** Smaller average yield.
- **b.** Larger average yield.
- **c.** Smaller standard deviation.
- **d.** Smaller maximum yield.
- **e.** Smaller standard error of the mean.

13. Sales agreements were designed under the expectation that the average yield this corporation would produce is 750 kg/acre when fully harvested. Assuming the appropriate conditions are met, this analysis indicates that the average yield will be

a. Statistically significantly less than expected.

b. Less than expected, but not significantly.

c. More than expected, but not significantly.

d. Statistically significantly more than expected.

e. Within 1% of the amount planners expected.

14. Do these data satisfy the conditions of a one-sample confidence interval for the mean?

a. Yes.

b. No, the sample size $n = 30$ is too small.

c. No, the data are not normally distributed.

d. No, the data were not sampled with replacement.

e. No, outlying yields have produced an unreliable estimated standard deviation.

15. When the full 10,000 acres is harvested, this analysis (assuming the usual conditions are met and with 95% confidence) can be expected to provide

a. Between 7,020,000 to 7,460,000 kg wheat.

b. The sample does not produce an estimate of the total yield.

c. Between 5,760,000 to 8,700,000 kg wheat

d. Between 6,750,000 to 7,630,000 kg wheat

e. Between 6,040,000 to 8,440,000 kg wheat

16. Prior to this season, the firm from which the corporation purchased seeds promised that this variety would produce on average more than 700 kg wheat per acre. Assuming the necessary conditions are met, a statistical test of the null hypothesis H_0: $\mu \leq 700$ kg/acre has p-value

a. About 1/6

b. About 1/3

c. Less than 0.05

d. About 1/2

e. Larger than 1/2

QUESTIONS 17–20

The Transportation Department (TDP) is concerned about over-weight trucks damaging highways. TDP maintains that no more than 10% of trucks on the roads are over-weight and has publically indicated that the percentage is less. As a precaution, TDP plans to weigh a sample of trucks operating on major routes. Unless the data reject its beliefs, TDP will continue normal operations. If the data reject its beliefs, TDP will institute reforms. Let p denote the population proportion of overweight trucks operating on roads.

17. The appropriate null hypothesis for TDP to test is

a. H_0: $p \leq 0.10$

b. H_0: *sample proportion* ≤ 0.10

c. H_0: $p = 0.10$

d. H_0: $p = 0.50$

e. H_0: $p \geq 0.10$

18. TDP plans to estimate p by the sample proportion of overweight trucks from a random sample of size $n = 100$. If in the population, $p = 0.10$ then the probability that more than 20% of the trucks in a sample are overweight

a. Is about 0.13.

b. Is less than 0.05.

c. Is about 0.37.

d. Cannot be determined without further information.

e. Is more than 0.84.

19. A critic of TDP gathered a sample of $n = 400$ trucks and used these to test H_0: $p \leq 0.09$ with $n = 400$. In her random sample, the sample proportion of overweight trucks was 0.10 (10%). She should conclude that

a. She needs a larger sample to test H_0.

b. She should reject H_0.

c. She cannot reject H_0.

d. She should change H_0 to match the data, revising it to H_0: $p \leq 0.10$.

e. The data do not meet the conditions for using a one-sample t-test.

20. An analyst dislikes hypothesis testing and produced a 95% confidence interval from an independent sample of data, with the interval found to be 0.093 to 0.157. Based on this confidence interval (assuming the usual conditions), the analyst should

a. Reject H_0: $p = 0.10$.

b. Reject H_0: $p \neq 0.10$.

c. Use a 90% confidence interval instead.

d. Gather more data until the confidence interval omits 0.10.

e. Not reject H_0: $p = 0.10$.

Only answer the rest of the questions if you wish to waive STAT completely.

21. Which of the following summaries from a fitted regression best measures the degree of collinearity associated with an estimated coefficient?

a. R^2.

b. RMSE.

c. The VIF for the coefficient.

d. The standard error of the slope.

e. The 95% confidence band for the true regression line.

22. If the variances of the error terms in a simple regression increase with increasing values of the explanatory variable X and one incorrectly assumes the SRM, then the

a. Estimated slope will be too steep.

b. Estimated intercept will be too close to zero.

c. Explanatory variable should be re-expressed on a log scale.

d. Residuals from the fit will appear to be autocorrelated.

e. Prediction intervals for small values of X will be too wide.

23. When building a regression model with a categorical explanatory variable, a common diagnostic plot shows side-by-side comparison boxplots of the model residuals grouped by the levels of the categorical variable. This plot is most useful to

a. Check the assumption of independence.

b. Check assumption of equal variance.

c. Check the assumption of normality.

d. Identify the presence of leveraged outliers.

e. Determine the statistical significance of the categorical variable.

24. Regression models assume that some of the variability in the response is due to random sources not identified in the model's equation. The estimated standard deviation of this unexplained variation is known as

a. RMSE.

b. Standard error of *Y*.

c. Standard error of *X*.

d. R^2.

e. *F* - ratio.

25. If the variable X_2 is added to a simple regression that includes X_1, then which of the following must happen in the multiple regression if X_1 and X_2 are uncorrelated?

a. RMSE must get smaller.

b. The partial regression coefficient for X_2 will be smaller than that for X_1.

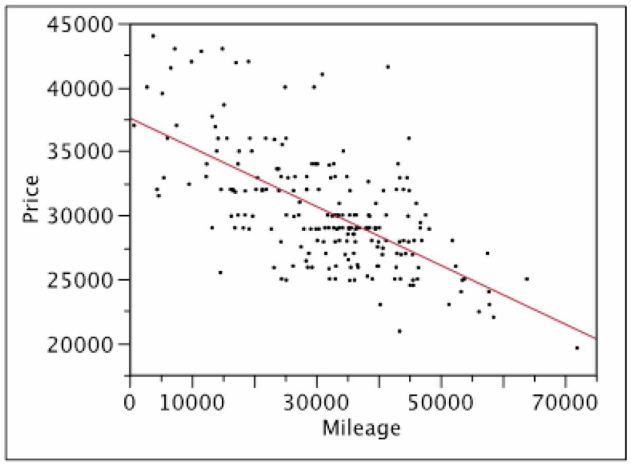
c. The overall ANOVA F-statistic will have a larger p-value.

d. The partial regression coefficient for X_1 will be the same as the marginal coefficient.

e. The overall ANOVA F-statistic will have a smaller p-value.

QUESTIONS 26–31

The data shown in the following scatterplot and simple regression report the price and the number of miles driven for 218 used cars (all in the BMW 325 series) offered for sale in the San Francisco area.



PRICE ($) = 37650 – 0.24 MILEAGE

RSquare	0.42
Root Mean Square Error	3500
Mean of Response	30269
Observations	218

26. According to the fitted equation, a car like these with 40,000 miles would be expected to cost on average

- **a.** $37,650.
- **b.** $30,450.
- **c.** $28,050.
- **d.** $36,690.
- **e.** $25, 050.

27. A used car with 40,000 miles is offered for sale at a price that is $3,500 above the prediction from this model. Given that the assumptions of the SRM hold, then this car's price is

- **a.** Larger than about 50% of cars with 40,000 miles.
- **b.** Larger than about 95% of cars with 40,000 miles.
- **c.** Larger than about 5% of cars with 40,000 miles.
- **d.** Larger than about 84% of cars with 40,000 miles.
- **e.** Larger than about 67% of cars with 40,000 miles.

28. The equation of the fitted model implies that on average for cars such as these, an additional 1,000 miles of driving

- **a.** Has no effect on the expected price of the used car.
- **b.** Increases the expected price by about $240.
- **c.** Decreases the expected price by about $240.
- **d.** Increases the expected price by about 24 percent.
- **e.** Decreases the expected price by about 240 percent.

29. An economist claims that the elasticity of price with respect to mileage driven is constant. How would you adapt this model to estimate the elasticity?

- **a.** The model does not need to be changed.
- **b.** Take the log of price but not mileage.
- **c.** Take the log of mileage but not price.
- **d.** Add a quadratic term to the model to create a power function.
- **e.** Regress the log of price against the log of mileage.

30. To obtain a more precise estimate of the slope in this model, we should (assuming the assumptions of the SRM hold)

- **a.** Remove the outlying expensive cars with prices above $40,000.
- **b.** Remove all of the cars with mileage above 50,000.
- **c.** Add prices for 10 more cars which have the average mileage $\overline{x} = 32{,}000$ miles.
- **d.** Add prices for 10 low-mileage cars.
- **e.** Add prices for 5 low-mileage cars and 5 cars with 50,000 to 60,000 miles.

31. If an additional variable, the age of the car, were added to the regression, then which of the following would you expect to happen.

- **a.** Severe autocorrelation would be introduced.
- **b.** Collinearity would be eliminated.
- **c.** R-squared would decrease.
- **d.** The estimated regression coefficient for mileage would be closer to zero.
- **e.** The standard deviation of the residuals would increase.

QUESTIONS 32–43

A banking analyst was interested in predicting the yield on a ten-year bond for a new issue from a company in one of two South East Asian countries (Malaysia or Singapore). The analyst collected data on 85 previous bond issues from different companies in the region. Output on the next page shows a model that includes a country effect, the annual revenue of the bond-issuing company in millions of $US in the previous year and a measure of the financial leverage of the company (calculated as the ratio of total liabilities to net worth). Note that the variable "Financial Leverage" has nothing to do whatsoever with the concept of statistical leverage.

SUMMARY OF FIT

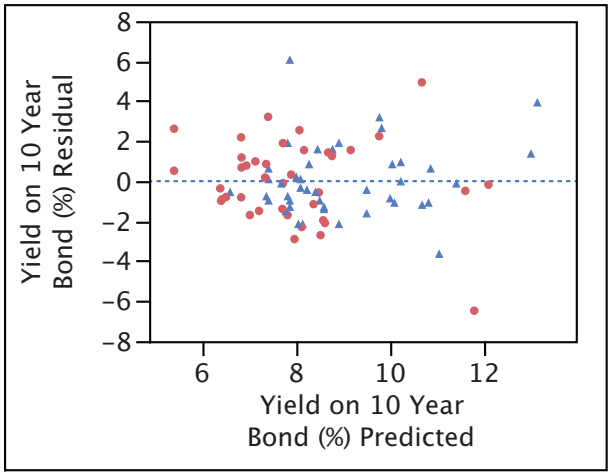
RSquare	0.407634
Root Mean Square Error	1.931565
Mean of Response	8.490706
Observations (or Sum Wgts)	85

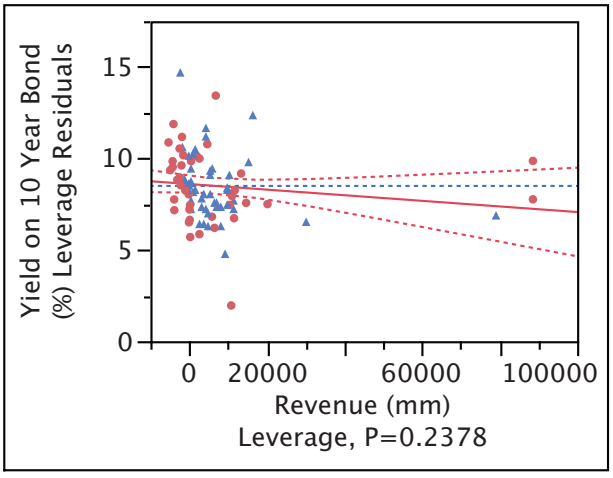
ANALYSIS OF VARIANCE

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	207.96174	69.3206	18.5799
Error	81	302.20642	3.7309	**Prob > F**
C. Total	84	510.16816		<.0001*

INDICATOR FUNCTION PARAMETERIZATION

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	6.4595152	0.434899	14.85	<.0001*
Revenue (mm)	-1.531e-5	1.287e-5	-1.19	0.2378
Financial Leverage	0.7118301	0.11191	6.36	<.0001*
country[Malaysia]	1.0083861	0.423381	2.38	0.0196*





32. The estimated yield on a bond based on the fitted model for a Singaporean company with revenues of \$25 (mm) and a Financial Leverage of 2 is approximately

a. 15.4

b. 40.6

c. 7.9

d. 7.5

e. 8.5

33. If we remove the variable Financial Leverage from this multiple regression, then (given the assumptions of the Multiple Regression Model [MRM] hold)

a. The value of R^2 would increase by a significant amount.

b. The value of R^2 would increase.

c. The value of R^2 would decrease.

d. The value of R^2 would decrease by a significant amount.

e. The change in the value of R^2 cannot be determined.

34. A bond from a company with \$20 (mm) revenue and Financial Leverage of 3 is issued. In which country would it be expected to have the lower yield?

a. Singapore.

b. Malaysia.

c. The model predicts the same yield in both countries.

d. There is no information available in the model to answer this question.

e. This question cannot be answered without an interaction in the model.

35. If a company in Singapore were to increase its Financial Leverage by 1, keeping revenues constant, this model implies that the yield would be expected to

a. Decrease on average by between (0.488, 0.936) with 95% confidence

b. Decrease on average by between (-3.15, 4.58) with 95% confidence.

c. Increase on average by between (0.488, 0.936) with 95% confidence.

d. Increase on average by between (-3.15, 4.58) with 95% confidence

e. Decrease on average by between (0.598, 0.825) with 95% confidence

36. The fitted regression model includes a positive estimated coefficient for Financial Leverage. The best interpretation of this coefficient is that

- **a.** If this variable were removed from the model, then R-squared would increase but not by a significant amount.
- **b.** Within a specific country and for those with identical Financial Leverages but different Revenues, companies are expected to have identical yields.
- **c.** Within a specific country and for those with identical Revenues, companies with greater Financial Leverage are expected to have higher yields, but the difference is not significant.
- **d.** Within a specific country and for those with identical Revenues, companies with greater Financial Leverage are expected to have higher yields and the difference is significant.
- **e.** Companies with more leverage have higher yields.

37. If the analysts had measured Revenues in Japanese Yen rather than dollars and rerun the above model then which of the following regression summaries would change in value?

- **a.** R^2.
- **b.** Standard error of the estimated Revenue slope.
- **c.** t-statistic for the Revenue slope.
- **d.** RMSE.
- **e.** Overall Anova F-ratio.

38. With reference to the leverage plot for Revenue, which of the following is a reasonable conclusion?

- **a.** There is severe collinearity in this dataset.
- **b.** Autocorrelation is likely.
- **c.** There are no leveraged outliers in the dataset.
- **d.** Leveraged observations produce a significant effect for Revenue in the model.
- **e.** Leveraged observations reduce the standard error of Revenue in the model.

Output below on this page comes from a model that drops three outliers in Revenue and adds an interaction between Financial Leverage and the variable Country.

SUMMARY OF FIT

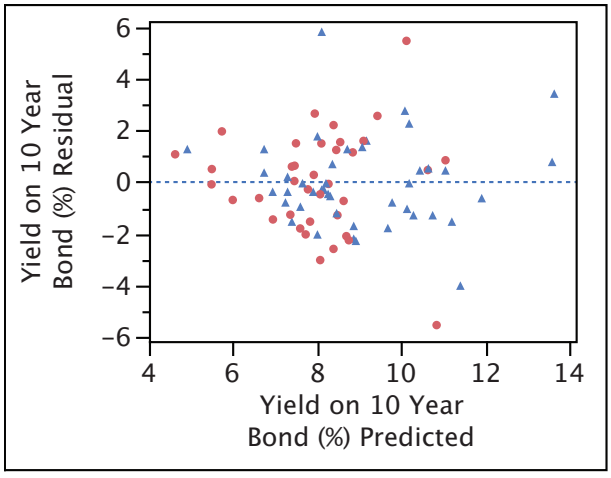
RSquare	0.465887
Root Mean Square Error	1.856047
Mean of Response	8.558659
Observations (or Sum Wgts)	82

ANALYSIS OF VARIANCE

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	4	231.37523	57.8438	16.7911
Error	77	265.25812	3.4449	**Prob > F**
C. Total	81	496.63335		<.0001*

INDICATOR FUNCTION PARAMETERIZATION

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	7.3640367	0.545934	13.49	<.0001*
Revenue (mm)	-0.000115	3.748e-5	-3.08	0.0029*
Financial Leverage	0.469127	0.161105	2.91	0.0047*
Country[Malaysia]	0.3603138	0.640399	0.56	0.5753
Financial Leverage*country[Malaysia]	0.2875725	0.210909	1.36	0.1767



39. Which of the following features is the new model (that excludes the three leveraged points and adds an interaction) able to address that the original model (shown on page 171) could not?

a. That the slope for Revenue depends on the county.

b. That yields in Singapore are lower than in Malaysia.

c. A differential impact of Financial Leverage on yields across countries.

d. Autocorrelation of the residuals due to the time series nature of the data.

e. Collinearity between Revenue and Financial Leverage.

40. Comparing the new model (that excludes the three leveraged points and adds an interaction) to the original model, a fair interpretation of the results is that

- **a.** The interaction term adds significant explanatory power to the model.
- **b.** The interaction term removes collinearity from the model.
- **c.** The Country term should be removed from the model since not significant.
- **d.** The removal of the three outliers reveals the importance of Revenue.
- **e.** The removal of the three outliers improperly inflates R^2.

41. Assuming the MRM holds, what does the p-value for Revenue in the interaction model tell you?

- **a.** The Revenue variable should be removed from the model.
- **b.** The probability that the true Revenue partial slope is one is less than 0.0001.
- **c.** If the true Revenue partial slope were equal to zero, then it is extremely unlikely that we would have observed an estimate so far from zero.
- **d.** That the confidence interval for the partial slope of Revenue contains zero.
- **e.** The addition of Revenue to a model containing the others adds little to R^2.

42. Based on the new fitted model above with the interaction term, the estimated yield on a bond for a Singaporean company with revenues of $25 (mm) and a Financial Leverage of 2 is approximately

- **a.** 8.3
- **b.** 8.9
- **c.** 8.6
- **d.** 9.2
- **e.** 0.93

43. If a company with the characteristics presented in the prior question (#42) issued a bond and its yield was less than 0.5 below the predicted yield, then based on the fitted interaction model would you be surprised?

- **a.** No, as this event is almost certain to happen.
- **b.** No, as this event lies within the statistical uncertainty of the model.
- **c.** No, as the high value of R^2 makes this likely with 95% confidence.
- **d.** Yes, because the large sample size makes this unlikely.
- **e.** Yes, as this yield is more than twice the RMSE from the fitted value.

Sample Exam Answers STAT 613

1. **d.**
2. **b.**
3. **e.**
4. **e.**
5. **c.**
6. **e.**
7. **b.**
8. **d.**
9. **d.**
10. **c.**
11. **b.**
12. **e.**
13. **a.**
14. **a.**
15. **a.**
16. **c.**
17. **a.**
18. **b.**
19. **c.**
20. **e.**
21. **c.**
22. **e.**
23. **b.**
24. **a.**
25. **d.**
26. **c.**
27. **d.**
28. **c.**
29. **e.**
30. **e.**
31. **d.**
32. **c.**
33. **d.**
34. **a.**
35. **c.**
36. **d.**
37. **b.**
38. **e.**
39. **c.**
40. **d.**
41. **c.**
42. **a.**
43. **b.**