FIN 6100 Spring 2018 Exam 1 Name Answer Key

NOTE: Type your name in cell G1

Multiple Choice

1	**C**	0
2	**E**	0
3	**B**	0
4	**E**	0
5	**D**	0
6	**A**	0
7	**B**	0
8	**C**	0
9	**A**	0
10	**C**	0

Total missed	0
Points off	0

Answer Key

Problem #1 (10 points) You have successfully started and operated a company for the past 10 years. You have decided that it is time to sell your company and spend time on the beaches of Hawaii. A potential buyer is interested in your company, but does not have the necessary capital to pay you a lump sum. Instead, he has offered $500,000 today and annuity payments for the balance. The first payment will be for $225,000 in three months. The payments will increase at 2.2 percent per quarter and a total of 30 quarterly payments will be made. If you require an EAR of 11.5 percent, how much are you being offered for your company?

Years company owned		10
Cash today	$	500,000
First annuity payment	$	225,000
Months to first payment		3
Quarterly increase in payments		2.2%
Number of payments		30
Return (EAR)		11.5%

APR	11.035%
Rate per quarter	2.759%
"Real" rate per quarter	0.547%
"Real" payments	$220,156.56
PV of payments	$6,076,242.75
Total value offered	**$6,576,242.75**

Answer Key

Problem 2 (10 points) You have just won the lottery! While the value of the lottery was announced as $130 million, upon reading the fine print you find that you will actually receive 25 equal annual payments with the first payment received today. You would prefer equal monthly payments over the next 60 years with the first payment received today. If the APR is 9.5 percent compounded daily, what equal monthly payment would make you equally as well off as the payments proposed by the lottery?

Lottery value	$ 130,000,000
Number of payments	25
Annual payment	$ 5,200,000
APR	9.5%
Compounding periods for interest rate	365
Years for monthly payments	60
EAR	9.965%
PV of winnings	$52,045,822.86
APR with monthly compounding	9.536%
Monthly payments	**$411,728.24**

Answer Key

Problem 3 (13 points) You are saving for retirement and currently have $50,000 in your retirement account. You want to have $10 million in your account in nominal dollars when you retire in 35 years. You will make monthly deposits into your account until you retire. When you retire, you will make monthly withdrawals for 30 years. You can earn an 11.1 percent nominal EAR before you retire and a 6.4 percent nominal EAR after you retire. The inflation rate is a 3.5 percent EAR over the entire period. How much will you need to deposit each month in real terms to fully fund your retirement? How much can you withdraw each month in real terms during your retirement? How much will your last withdrawal be in nominal terms?

Current value of account	$ 50,000
Nominal retirement account value	$ 10,000,000
Years for savings	35
Savings periods per year	12
Years for withdrawals	30
Pre-retirement nominal EAR	11.10%
Post-retirement nominal EAR	6.40%
Inflation rate (EAR)	3.50%

Real retirement account value $2,999,768.62

Pre-retirement real EAR	7.343%	Post-retirement real EAR	2.802%
Pre-retirement real APR	7.107%	Post-retirement real APR	2.767%

Real amount to save each month $1,300.44

Real monthly withdrawals $12,272.65

Nominal value of last withdrawal $114,831.53

Answer Key

Problem 4 (9 points) An engineer in 1965 earned an average of $8,100 per year. In 2017, the average salary had increased to $93,000. Over the same period, the average price of goods has increased by 6.07 times. What the real income in 1965 dollars?

Beginning year		1965
Beginning salary	$	8,100
Ending year		2017
Ending salary	$	93,000
Increase in price of goods		6.07

Number of years	52
Inflation rate	3.53%
Nominal rate	4.81%
Real increase	1.23%
Current salary in base year terms	$15,321.25

Answer Key

Problem 5 (8 points) Following are the abbreviated financial statements for a company

							Income Statement	
			Balance Sheet				Sales	$16,560
	2016	**2017**		**2017**	**2019**		Costs	7,722
Current	$1,306	$1,414	Current liab.	$522	$586		Depreciatio	1476
Fixed assets	5,382	6,480	Long-term debt	2,844	3,024		Interest	422

a. What is owners' equity for each year?
b. What is the change in net working capital for 2017?
c. In 2017, the company purchased $2,700 in new fixed assets. How much in fixed assets did the company sell? If the tax rate is 23 percent, what is the cash flow from assets?
d. During 2017, the company raised $540 in new long-term debt. How much in long-term debt did the company pay off during the year? What is the cash flow to creditors?

New fixed assets	$	2,700
Tax rate		23%
New long-term debt	$	540

a.	Total assets beginning of year	$	6,688		Total assets end of year	$	7,894
	Total liabilities beginning	$	3,366		Total liabilities end	$	3,610
	Beginning equity	$	3,322		Ending equity	$	4,284
b.	Beginning NWC	$	784				
	Ending NWC	$	828				
	Change in NWC	$	44				
c.	Net capital spending	$	2,574				
	Fixed assets sold	$	126				
	Sales	$	16,560.00				
	Costs		7,722.00				
	Dep		1,476.00				
	EBIT	$	7,362.00				
	Int		422.00				
	EBT	$	6,940.00				
	Tax		1,596.20				
	NI	$	5,343.80				
	OCF	$	7,241.80				
	Cash flow from assets	$	4,623.80				
d.	Net new borrowing	$	180				
	Cash flow to creditors	$	242				
	Debt retired	$	360				

Answer Key

Problem 6 (8 points) Credit terms are often stated in the following manner: 1/10, net 30. This means that if you pay within 10 days, you can take a 1 percent discount on the price, else the full amount is due in 30 days. For example, if you buy $1,000 in goods, you can pay $990 within 10 days or pay $1,000 within 30 days. What is the EAR on this arrangement if you do not take advantage of the discount?

Disount	1 /	10
Net		30
Days per yer		365
Discount period (days)		20
Periods per year		18.25
Rate per period		1.01%
APR		18.43%
EAR		**20.13%**

Answer Key

Problem 7 (10 points) The most recent financial statements a company are shown below. Sales for next year are projected to grow by 20 percent. Interest expense and depreciation will remain constant; the tax rate and the dividend payout rate will also remain constant. Costs, other expenses, current assets, and accounts payable increase spontaneously with sales. Suppose the company is operating at 90 percent capacity and wishes to increase its sales by 20 percent. Prepare the pro forma financial statements and calculate the EFN. Assume fixed assets can be increased in any dollar amount desired and the company is willing to operate at full capacity.

Projected growth rate		20%
Tax rate		40%
Operating capacity		90%

Sales	$	198,000,000
Cost of goods sold		108,600,000
Other expenses		21,500,000
Depreciation		10,500,000
EBIT	$	57,400,000
Interest		4,350,000
EBT	$	53,050,000
Taxes (40%)		21,220,000
Net income	$	31,830,000
Dividends	$	19,098,000
Additions to retained earnings		12,732,000

Assets			Liabilities & Equity		
Current assets			Current liabilities		
Cash	$	1,358,000	Accounts payable	$	2,400,000
Accounts receivable		4,180,000	Notes payable		5,830,000
Inventory		8,753,000	Total	$	8,230,000
Total	$	14,291,000	Long-term debt	$	67,500,000
			Owners' equity		
Fixed assets			Common stock and paid-in surplus	$	8,000,000
Net plant and equipment	$	125,580,000	Accumulated retained earnings		56,141,000
			Total	$	64,141,000
Total assets	$	139,871,000	Total liabilities and owners' equity	$	139,871,000

NOTE: I have included the outline for the pro forma financial statements below to save time.
However, other calculations may be required.

Payout ratio	60.000%
Full capacity sales	$ 220,000,000
Full capacity ratio = Fixed assets / Full capacity sales	0.570818182

Sales	$	237,600,000
Cost of goods sold		130,320,000
Other expenses		25,800,000
Depreciation		10,500,000
EBIT	$	70,980,000
Interest		4,350,000
EBT	$	66,630,000
Taxes (40%)		26,652,000
Net income	$	39,978,000
Dividends	$	23,986,800
Additions to retained earnings		15,991,200

Assets			Liabilities & Equity		
Current assets			Current liabilities		
Cash	$	1,629,600	Accounts payable	$	2,880,000
Accounts receivable		5,016,000	Notes payable		5,830,000
Inventory		10,503,600	Total	$	8,710,000
Total	$	17,149,200	Long-term debt	$	67,500,000
			Owners' equity		
Fixed assets			Common stock and paid-in surplus	$	8,000,000
Net plant and equipment	$	135,626,400	Accumulated retained earnings		72,132,200
			Total	$	80,132,200
Total assets	$	152,775,600	Total liabilities and owners' equity	$	156,342,200

EFN	$	(3,566,600)