FIN 6100 Spring 2018 Exam 2 Name Answer Key

NOTE: Type your name in cell G1

Multiple Choice

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

Missed 0

Points off 0

Answer Key

Problem #1 (10 points)

Calculate the WACC for the following firm:

Debt: 55,000 bonds with a par value of $1,000 and a quoted price of 105.30. The bonds have coupon rate of 4.8 percent and 9 years to maturity. 40,000 bonds with a par value of $2,000 and a quoted price of 107.30. The bonds have a coupon rate of 5.3 percent and 28 years to maturity.

Preferred Stock: 600,000 shares of 4.3 percent preferred stock with a par value of $25 selling at a price of $28.85

Common Stock: 1,700,000 shares of stock selling at a market price of $85. The beta of the stock is 1.15, the current dividend was $0.70 and the dividend growth rate is 4.5 percent.

Market: The market risk premium is 7.5 percent and the risk-free rate is 3.1 percent. The corporate tax rate is 21 percent.

Debt:	Bond 1	Bond 2
Number of bonds	55,000	40,000
Par value (% of par)	100	100
Par value ($)	$ 1,000	$ 2,000
Coupon rate	4.80%	5.30%
Quoted price	105.30	107.30
Settlement date	1/1/2000	1/1/2000
Maturity date	1/1/2009	1/1/2028
Coupons per year	2	2
Preferred stock		
Number of shares	600,000	
Dividend	4.30%	
Par value	$ 25	
Price	$ 28.85	
Common stock		
Number of shares	1,700,000	
Price	$ 85.00	
Beta	1.15	
Current dividend	$ 0.70	
Dividend growth rate	4.50%	
Market		
Market risk premium	7.5%	
Risk-free rate	3.1%	
Tax rate	21%	

Debt	Bond 1	Bond 2
YTM	4.09%	4.82%
Aftertax cost	3.23%	3.81%
Prferred dividend	$ 1.08	
Cost of preferred	3.73%	
Cost of equity		
CAPM	11.73%	
DDM	5.36%	Too low - ignore

	Market value	Weight
Bond 1	$ 57,915,000	0.1895
Bond 2	85,840,000	0.2809
Preferred	17,310,000	0.0566
Equity	144,500,000	0.4729
Total	$ 305,565,000	1.00

WACC	7.44%

Answer Key

Problem #2 (11 points)

Your company has a new project available. You will sell 125,000 units per year at a price of $150 for 5 years. Equipment will cost $3.5 million and will be depreciated on a 3-year MACRS schedule. The equipment can be sold for $400,000 at the end of the project and fixed costs are $3 million per year. The project requires a 14 percent return and net working capital equal to 10 percent of annual sales at the beginning of the project to be returned at the end of the project. What is the maximum variable cost per unit you could have to accept the project? The tax rate is 22 percent.

Units sold		125,000				
Price	$	150				
Equipment	$	3,500,000				
		Year 1	Year 2	Year 3	Year 4	
Depreciation		33.33%	44.45%	14.81%	7.41%	
Project life (years)		5				
Equipment salvage value	$	400,000				
Fixed costs	$	3,000,000				
Required return		14%				
Net working capital		10%				
Tax rate		22%				

VC per unit $ 110.00

	Year 0	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Sales		$ 18,750,000	$ 18,750,000	$ 18,750,000	$ 18,750,000	$ 18,750,000
VC		13,750,000	13,750,000	13,750,000	13,750,000	13,750,000
FC		3,000,000	3,000,000	3,000,000	3,000,000	3,000,000
Depreciation		1,166,550	1,555,750	518,350	259,350	-
EBT		$ 833,450	$ 444,250	$ 1,481,650	$ 1,740,650	$ 2,000,000
Tax		183,359	97,735	325,963	382,943	440,000
Net income		$ 650,091	$ 346,515	$ 1,155,687	$ 1,357,707	$ 1,560,000
+Depreciation		1,166,550	1,555,750	518,350	259,350	-
OCF		$ 1,816,641	$ 1,902,265	$ 1,674,037	$ 1,617,057	$ 1,560,000
Capital spending	$ (3,500,000)					312,000
NWC	(1,875,000)					1,875,000
Total cash flow	$ (5,375,000)	$ 1,816,641	$ 1,902,265	$ 1,674,037	$ 1,617,057	$ 3,747,000

Salvage		
Sell old	$	400,000
Taxes		(88,000)
Aftertax salvage value	$	312,000

NPV $1,715,705.12

Microsoft Excel 15.0 Answer Report
Worksheet: [FIN 6100 Exam 2 Spring 2018 with answers.xlsx]#2
Report Created: 3/19/2018 1:03:06 PM
Result: Solver found a solution. All Constraints and optimality conditions are satisfied.
Solver Engine

Engine: GRG Nonlinear
Solution Time: 0 Seconds.
Iterations: 1 Subproblems: 0

Solver Options

Max Time 100 sec, Iterations 100, Precision 0.000001
Convergence 0.0001, Population Size 100, Random Seed 0, Derivatives Forward, Require Bounds
Max Subproblems Unlimited, Max Integer Sols Unlimited, Integer Tolerance 5%

Objective Cell (Value Of)

Cell	Name	Original Value	Final Value
B41	NPV Year 0	$1,715,705.12	$0.00

Variable Cells

Cell	Name	Original Value	Final Value	Integer
B18	VC per unit Year 1	$ 110.00	$ 115.13	Contin

Constraints

Cell	Name	Cell Value	Formula	Status	Slack
B41	NPV Year 0	$0.00	B41=0	Binding	0

Answer Key

Problem #3 (11 points)

Marshall Industries in an all-equity firm. The company has projected sales of $153 million next year. Costs are expected to be $82 million, and net investment is expected to be $20 million. Each of these values is expected to grow over the following four years at 15 percent, 12 percent, 7 percent, and 5 percent, respectively. After that, the growth rate in each of these variables is expected to be 3.5 percent indefinitely. There are 6.2 million shares of stock outstanding. The company's stock has a beta of 1.15, the risk-free rate is 2.8 percent, and the expected return of the market is expected to be 10.7 percent. The corporate tax rate is 21 percent. What is your estimate of the current stock price?

Sales	$ 153,000,000				
Costs	$ 82,000,000				
Net investment	$ 20,000,000				
	1	*2*	*3*	*4*	
Revenue, cost, and investment growth	15%	12%	7%	5%	
Terminal growth rate	3.5%				
Shares outstanding	6,200,000				
Beta	1.15				
Risk-free rate	2.8%				
Expected return on market	10.7%				
Tax rate	21%				

Cost of equity 11.89%

	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 6*
Sales	$ 153,000,000	$ 175,950,000	$ 197,064,000	$ 210,858,480	$ 221,401,404	$ 229,150,453
Costs	82,000,000	94,300,000	105,616,000	113,009,120	118,659,576	122,812,661
Pretax profit	$ 71,000,000	$ 81,650,000	$ 91,448,000	$ 97,849,360	$ 102,741,828	$ 106,337,792
Taxes	14,910,000	17,146,500	19,204,080	20,548,366	21,575,784	22,330,936
Net income	$ 56,090,000	$ 64,503,500	$ 72,243,920	$ 77,300,994	$ 81,166,044	$ 84,006,856
Net investment	20,000,000	23,000,000	25,760,000	27,563,200	28,941,360	29,954,308
Cash flow	$ 36,090,000	$ 41,503,500	$ 46,483,920	$ 49,737,794	$ 52,224,684	$ 54,052,548

Year 5 terminal value $ 644,633,847

Value of company today $ 527,791,162

Price per share **$ 85.13**

Answer Key

Problem #4 (13 points)

Your company is considering a new project. Sales are expected to be 17,000, 19,000, 23,000, and 15,000 units over the next four years, respectively. Equipment necessary for production will cost $2.1 million, be depreciated on a 3-year MACRS schedule, and have no salvage value in four years. The unit sales price will be $93, variable costs will be $40, and the fixed costs each year will be $350,000. All dollar amounts are expressed in today's terms. The sales price is expected to increase at the general inflation rate of 3.5 percent, variable costs are expected to increase at 3 percent, and fixed costs are expected to increase at 4 percent. The real required return is 7 percent. The tax rate is 21 percent. What is the NPV of the project?

		Year 1	*Year 2*	*Year 3*	*Year 4*
Sales		17,000	19,000	23,000	15,000
Price	$	2,100,000			
Depreciation		33.33%	44.45%	14.81%	7.41%
Price	$	93			
VC	$	40			
FC	$	350,000			
Price increase		3.5%			
VC increase		3.0%			
FC increase		4.0%			
Real return		7%			
Tax rate		21%			

Time 0		
Equipment	$	(2,100,000)
	$	(2,100,000)

Nominal return		10.75%

	Year 1	*Year 2*	*Year 3*	*Year 4*
Price	$ 96.26	$ 99.62	$ 103.11	$ 106.72
VC	$ 41.20	$ 42.44	$ 43.71	$ 45.02
FC	$ 364,000.00	$ 378,560.00	$ 393,702.40	$ 409,450.50

	Year 1	*Year 2*	*Year 3*	*Year 4*
Sales	$ 1,636,335	$ 1,892,855	$ 2,371,548	$ 1,600,795
VC	700,400	806,284	1,005,309	675,305
FC	364,000	378,560	393,702	409,450
Dep	699,930	933,450	311,010	155,610
EBT	$ (127,995)	$ (225,439)	$ 661,526	$ 360,429
Tax	(26,879)	(47,342)	138,921	75,690
NI	$ (101,116)	$ (178,097)	$ 522,606	$ 284,739
+Dep	699,930	933,450	311,010	155,610
OCF	$ 598,814	$ 755,353	$ 833,616	$ 440,349

Year		CF
0	$	(2,100,000)
1		598,814
2		755,353
3		833,616
4		440,349

NPV	($36,892.82)

Answer Key

Problem #5 (25 points)

Equipment cost	$	25,000,000							
Equipment price in 5 years	$	6,000,000							
MACRS depreciation		14.29%	24.49%	17.49%	12.49%	8.93%	8.92%	8.93%	4.46%
Consulting costs	$	25,000							
		Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 6-17*		
Quantity (with computer)		90,000	105,000	115,000	125,000	110,000	0		
Price (with computer)	$	129							
Quantity (without computer)		15,000	15,000	15,000	15,000	15,000			
Price (without computer)	$	169							
Printer VC	$	34							
Printer FC	$	700,000							
Lost computer sales				2,000	2,000	2,000	2,000		
Computer price	$	1,200							
Computer VC	$	480							
Computer FC	$	900,000							
NWC		12%							
Tax rate		21%							
Cost of capital		13%							
Weight of debt		40%							
Weight of equity		60%							
Debt floatation costs		5%							
Equity floatation costs		7%							
Internal equity percentage		0%							

	Capital Structure	Floatation Costs
Debt	40%	5%
Equity	60%	7%
		6.20%

CF @ time 0		with floatation
Equipment	$ (25,000,000)	($26,652,452)
NWC	(1,697,400)	(1,697,400)
Total	$ (26,697,400)	$ (28,349,852)

	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 6-17*
Sales with computer	$11,610,000	$13,545,000	$14,835,000	$16,125,000	$14,190,000	
Sales stand-alone	2,535,000	2,535,000	2,535,000	2,535,000	2,535,000	
Lost sales	-	-	(2,400,000)	(2,400,000)	(2,400,000)	(2,400,000)
	$14,145,000	$16,080,000	$14,970,000	$16,260,000	$14,325,000	($2,400,000)
VC with computer	$ 3,060,000	$ 3,570,000	$ 3,910,000	$ 4,250,000	$ 3,740,000	
VC stand-alone	510,000	510,000	510,000	510,000	510,000	
VC - Lost sales	0	0	(960,000)	(960,000)	(960,000)	(960,000)
FC	$ 3,570,000	$ 4,080,000	$ 3,460,000	$ 3,800,000	$ 3,290,000	$ (960,000)

	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 6-17*
Sales	$ 14,145,000	$ 16,080,000	$ 14,970,000	$ 16,260,000	$ 14,325,000	$ (2,400,000)
VC	3,570,000	4,080,000	3,460,000	3,800,000	3,290,000	(960,000)
FC	700,000	700,000	700,000	700,000	700,000	
Depreciation	3,572,500	6,122,500	4,372,500	3,122,500	2,232,500	
EBT	$ 6,302,500	$ 5,177,500	$ 6,437,500	$ 8,637,500	$ 8,102,500	$ (1,440,000)
Tax	1,323,525	1,087,275	1,351,875	1,813,875	1,701,525	(302,400)
NI	$ 4,978,975	$ 4,090,225	$ 5,085,625	$ 6,823,625	$ 6,400,975	$ (1,137,600)
+Depreciation	3,572,500	6,122,500	4,372,500	3,122,500	2,232,500	-
OCF	$ 8,551,475	$ 10,212,725	$ 9,458,125	$ 9,946,125	$ 8,633,475	$ (1,137,600)
NWC beginning	$ 1,697,400	$ 1,929,600	$ 1,796,400	$ 1,951,200	$ 1,719,000	
NWC end	1,929,600	1,796,400	1,951,200	1,719,000	-	
NWC CF	$ (232,200)	$133,200	($154,800)	$232,200	$1,719,000	$0
Sell old	$ 6,000,000					
Taxes	(88,725)					
Aftertax salvage value	$ 5,911,275					
OCF	$ 8,551,475	$ 10,212,725	$ 9,458,125	$ 9,946,125	$ 8,633,475	$ (1,137,600)
Capital spending					5,911,275	
NWC CF	(232,200)	133,200	(154,800)	232,200	1,719,000	
NWC CF old	$ 8,319,275	$ 10,345,925	$ 9,303,325	$ 10,178,325	$ 16,263,750	$ (1,137,600)

Cash Flows	*t*	*CF*	*Cumulative CF*
	0	$ (28,349,852)	
	1	$ 8,319,275	($20,030,577)
	2	$ 10,345,925	($9,684,652)
	3	$ 9,303,325	($381,327)
	4	$ 10,178,325	$9,796,998
	5	$ 16,263,750	$26,060,748
	6	$ (1,137,600)	
	7	$ (1,137,600)	
	8	$ (1,137,600)	
	9	$ (1,137,600)	
	10	$ (1,137,600)	
	11	$ (1,137,600)	
	12	$ (1,137,600)	
	13	$ (1,137,600)	
	14	$ (1,137,600)	
	15	$ (1,137,600)	
	16	$ (1,137,600)	
	17	$ (1,137,600)	

NPV	$4,978,441.35
IRR	-10.14%
IRR	20.97%
Payback	3.04