SAMPLE FINAL - SOLUTIONS

Question 1

Not applicable

Question 2

The Telescoping Tube Company is planning to raise $2,500,000 in perpetual debt at 11% to finance part of their expansion. They have just received an offer from the Xanadu government to raise the financing for them at 8% if they build in Xanadu. What is the total added value of debt financing to Telescoping Tube if their tax rate is 34% and Xanadu raises it for them?

(a) $1,300,000
(b) $ 850,000
(c) $1,200,000
(d) $1,818,180
(e) $1,650,000

+2.5 – $\frac{0.08(2.5)(1-0.34)}{0.11}$ **= +1.3**

Question 3

The ABC Corporation has decided to build a new facility for its R&D department. The cost of the facility is estimated to be $125 million. ABC wishes to finance this project using its traditional debt-equity ratio of 1.5. The issue cost of equity is 6% and the issue cost of debt is 1%. What is the total floatation cost? [Assume that the flotation cost is NOT raised as part of the capital.]

(a) $8.75 million
(b) $1.29 million.
(c) $0.75 million
(d) $3.75 million.
(e) $3.19 million.

$\frac{B}{S}$ **= 1.5 ⇒ B = 1.5S**

⇒ $\frac{B}{V} = \frac{1.5}{2.5}$ **= 60%**

⇒ **B = 75**

Total flotation cost = 1% (75) + 6% (50) = 3.75

Question 4

The Free-Float Company, a company in the 36% tax bracket, has risk-less debt in its capital structure which makes up 40% of the total capital structure, and equity is the other 60%. The beta of the assets for this business is 0.8 and the equity beta is:

(a) 0.80
(b) 0.73
(c) 0.53
(d) 1.14
(e) 1.47

$\beta_{eq} = \beta_{assets}[1 + \frac{D}{E}(1 - T_C)]$ **= 0.8 [1+** $\frac{0.4}{0.6}$ **(1-0.36)] = 1.1413**

Question 5

Your company has announced a dividend of $2.50 per share. You and the rest of the marginal investors are in the 35% tax bracket. What should happen to the stock price?

I. The price of stock should decrease by $1.625 immediately after the date of record.
II. The price of stock should decrease by $1.625 immediately after the ex-dividend date.
III. The price of stock should decrease by $3.85 immediately after the date of record.
IV. The price of stock should decrease by $3.85 immediately after the ex-dividend date.

(a) I only
(b) III only
(c) II and III only
(d) I and IV only
(e) II only

2.50(1-0.35) = 1.625

Question 6

If both dividends and capital gains are currently taxed at the same ordinary income tax rate, the effect of the tax is different because:

I. Capital gains are actually taxed, while dividends are taxed on paper only.
II. Dividends are actually taxed, while capital gains are taxed on paper only.
III. Dividends are taxable when distributed while capital gains are deferred until the stock is sold.
IV. Capital gains are taxable when distributed while dividends are deferred until the stock is sold.

(a) I only
(b) III only
(c) I and III only
(d) II and IV only
(e) II and III only

Question 7

Discounting the unlevered after tax cash flows by the _____ minus the _____ yields the _____.

(a) cost of capital for the unlevered firm; initial investment; Adjusted Present Value.
(b) cost of equity capital; initial investment; project NPV.
(c) weighted cost of capital; fractional equity investment; project NPV.
(d) cost of capital for the unlevered firm; initial investment; All equity Net Present Value.
(e) cost of capital for the unlevered firm; fractional equity investment; Adjusted Present Value.

Question 8

The Willaway Corporation had 2003 fixed assets of $1,345; current assets of 260, current liabilities of 180 and shareholder's equity of 775. The 2002 fixed assets were 1,300; current assets of 220, long-term liabilities of 390 and shareholder's equity of 750. What was the change in net working capital for Willaway in 2003?

(a) 80
(b) 20
(c) 60
(d) 160
(e) 240

$\Delta CA - \Delta CL$
= -40-200
= -240

	2003		**2002**
FA	1,345		1,300
CA	260	-40	220
	1,605		1,520
CL	180	-200	380
LTL	650		390
SE	775		750
	1,605		1,520

Question 9

Which of the following lists events in chronological order from earliest to latest?

(a) Date of Record, Declaration Date, Ex-Dividend Date
(b) Date of Record, Ex-Dividend Date, Declaration Date
(c) Declaration Date, Date of Record, Ex-Dividend Date
(d) Declaration Date, Ex-Dividend Date, Date of Record
(e) Ex-Dividend Date, Date of Record, Declaration Date

Question 10

Over the year, the Rigem Co. had cash flow from operations of $938, and had net capital spending of $225. In addition, the firm's Net Working Capital increased by $73. What was Rigem's total cash flow?

(a) $1,236
(b) $ 748
(c) $ 786
(d) $ 640
(e) $ 714

938 – 225 – 73 = 640

PROBLEM 1 (15 POINTS)

You are a manager at Spotless Inc. evaluating a project to build a new detergent manufacturing plant. Spotless Inc. has an equity beta of 2.5, and a debt ratio of 0.60 which has been relatively constant historically. Spotless Inc. pays a corporate tax rate of 35%. The interest rate they pay on their debt is 6%, the same as the T-bill rate, and the market is expected to earn a return 5% over T-bills.

The new project is forecast to have after-tax cash flows (in $ Millions) of

Year	**0**	**1**	**2**	**3**	**4**	**5**
Project FCF	-195	45	45	45	45	100

(a) Assuming the new project has similar risk to their historical investments and that the CAPM holds, what is the NPV of the project if it is all equity financed? **(10 points)**

$$\beta_{eq}^{L} = \beta_{unlev}\left[1 + \frac{B}{S}\left(1 - T_c\right)\right]$$

$$\Rightarrow \beta_{unlev} = 1.2658$$

$$r_s^U = 6 + 1.27(5) = 12.33\%$$

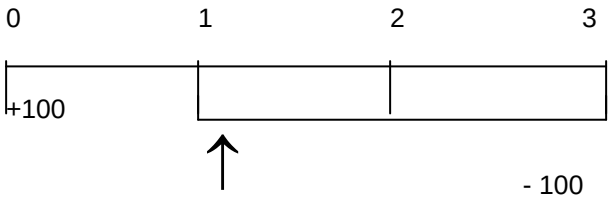
$$NPV_U = -195 + 45 * PVAF_{12.33\%,4} + \frac{100}{(1.1233)^5}$$

= - 3.35

PROBLEM 1 CONTINUED

(b) In fact, the project will be partially debt financed. Spotless Inc. will borrow $100M of the initial investment cost. They will pay interest on this debt each year, and repay the entire principal in year 3. What is the APV of the project? **(5 points)**

$NPVF_{debt}$:



After-tax interest expense
=(1-0.35)(6%)(100)= -3.9

$$NPVF_{debt} = +100 - 3.9 \times PVAF_{6\%,3} - \frac{100}{(1.06)^3}$$

= +5.61

APV = NPV_U + NPVF
= - 3.35 +5.61
= + 2.26

PROBLEM 2 (15 POINTS)

The organic tofu producer, MooMoo Inc., has an equity book value of $30 million and a book debt-to-equity ratio of 42%. The cost-of-debt is 8% and, if MooMoo were all equity financed, investors would expect a rate of return of 17%. MooMoo has annual sales of $128 million, cost of goods sold of $31 million, and annual administrative costs of $45 million. MooMoo's capital structure, sales, and costs continue into perpetuity, and the corporate tax rate is 45%. Assume that all cash flows are at year end, with the first occurring one year from now.
Using the APV method, calculate the equity value of MooMoo Inc.

Sales	128
-COGS	(31)
-Adm costs	(45)
EBIT	52
-Tax	(23.4)
CF to eq	28.6

$$V_u = \frac{EBIT(1-Tc)}{r_O} = \frac{52(1-0.45)}{0.17} = 168.24$$

$$V_L = V_U + T_C B = 168.24 + 0.45(0.42\, S_L)$$

$$= 168.24 + 5.67 = 173.91$$

$$B = 0.42 S_L \qquad S_L = 161.31$$

$$= 12.6$$

PROBLEM 3 (10 POINTS)

The predicted cash flows for the All-Mine Corporation are $4,500 in a good economy, $3,000 in an average economy, and $1,000 in a poor economy. Each economic outcome is equally likely and the promised debt repayment is $3,000. The firm is deciding whether to invest in a new project. The project would have to be financed by equity; the cost is $2,000 and will return $2,500 or 25% in one year. The discount rate for both bonds and stock is 15% and the tax rate is zero.

(a) What is the value of the firm and its components before and after the project addition? **(8 points)**

BEFORE

	G	A	P
	4,500	3,000	1,000
Bonds	(3,000)	(3,000)	(1,000)
EQ	1,500	0	0

$$B = \frac{1/3(3{,}000) + 1/3(3{,}000) + 1/3(1{,}000)}{1.15}$$

= 2,029

AFTER

CF=Before + 2,500

	G	A	P
	7,000	5,500	3,500
	(3,000)	(3,000)	(3,000)
	4,000	2,500	500

$$B' = \frac{1/3(3{,}000) + 1/3(3{,}000) + 1/3(3{,}000)}{1.15}$$

= 2,609

$$\Delta B = +580$$

$$S = \frac{1/3(1{,}500) + 1/3(0) + 1/3(0)}{1.15}$$

= 435

$$S' \frac{1/3(4{,}000) + 1/3(2{,}500) + 1/3(500)}{1.15}$$

= 2,029

$$\Delta S = +1{,}594$$

PROBLEM 3 CONTINUED

(b) Should the company take the project? Will it? **(2 points)**

$\Delta B = +580$
$\Delta S = +1{,}594$

For equity:

0	1
-2,000	+1,594

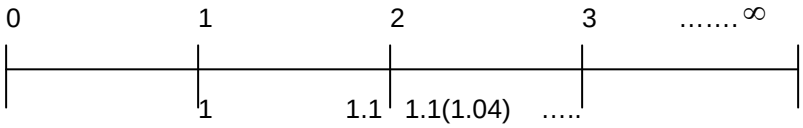
NPV= -2,000+1,594= = 406 < 0
$\Rightarrow$ Don't accept

PROBLEM 4 (10 POINTS)

The publicly traded company, Finito.com, is an all-equity company with 2 million shares outstanding trading at $50 a share. Finito.com is considering buying a private company, Voila Inc, for $10 million. Voila Inc. expects to generate after-tax cash flow over the coming year of $1 million, $1.1 million the following year, and to experience growth of 4% thereafter. Finito.com's stock has a beta of 0.8, while it is believed that the beta of Voila's cash flows is 1.2. The current risk-free interest rate is 6% and the market risk premium is 8%.

(a) Would you recommend that Finito.com purchase Voila Inc? **(6 points)**

$$r = r_f + \beta\left[r_m - r_f\right] = 0.06 + 1.2(0.08) = 15.6\%$$



$$V_o = \frac{1}{1.156} + \frac{1.1}{1.156^2} + \frac{\frac{1.1(1.04)}{0.156 - 0.04}}{1.156^2} = 9.1$$

At a cost of 10 million, negative NPV! Don't buy!

PROBLEM 5 (15 POINTS)

This question is designed to demonstrate homemdade leverage.
Consider a world with no corporate taxes, no bankruptcy costs, and perfect capital markets. Individuals and corporations can borrow or lend at 10%. Aloha Inc. is currently all-equity financed with one million shares outstanding that are valued at $20 per share. Niles and Daphne's current dollar holdings of Aloha Inc.'s shares and their overall borrowing and lending positions are as follows:

Table 1: Given

	Aloha Inc. shares	Borrowing	Lending
Niles	$30,000	$5,000	0
Daphne	$75,000	0	$10,000

Suppose Aloha Inc. issues debt to repurchase 20 percent of its shares. Calculate Niles and Daphne's new positions, assuming they want to maintain the same return on their portfolios? (Give your answer in the table below and numerically show that the returns are the same in Tables 1 and 2 for each investor.) **(9 POINTS)**

Table 2: Your calculations

	Aloha Inc. shares	**Borrowing**	**Lending**
Niles	24,000	0	1,000
Daphne	60,000	0	25,000

Niles: $\downarrow 20\% \; of \; 30{,}000 = \downarrow 6{,}000$

Daphne: $\downarrow 20\% \; of \; 75{,}000 = \downarrow 15{,}000$

$$r_S = r_o + \frac{B}{S}\left(r_o - r_B\right) = r_o + \frac{4}{16}\left(r_o - 10\right) \text{.....Equation (1)}$$

Niles:

Before: $\frac{30}{25} r_o - \frac{5}{25}(10)$

After: $\frac{24}{25} r_S + \frac{1}{25}(10) = \frac{24}{25}\left[r_o + \frac{4}{16}(r_o - 10)\right] + \frac{1}{25}(10) = \frac{30}{25} r_o - \frac{5}{25}(10)$

Daphne:

Before: $\frac{75}{85} r_o + \frac{10}{85}(10)$

After: $\frac{60}{85} r_S + \frac{25}{85}(10) = \frac{60}{85}\left[r_o + \frac{4}{16}(r_o - 10)\right] + \frac{25}{85}(10) = \frac{75}{85} r_o + \frac{10}{85}(10)$

PROBLEM 5 CONTINUED

Suppose the corporate tax rate is 20%. Aloha Inc. issues $1 million of perpetual debt and uses the proceeds to repurchase equity. How much does the value of the firm increase? How much does Niles and Daphne's total wealth increase [in $] assuming their initial positions are the same as in Table 1? **(6 POINTS)**

$$V_U = n \times P_O = 1 \times 20 = 20$$

$$V_L = V_U + T_C B = 20 + 0.2(1) = 20.2$$

$$\Rightarrow Value\ of\ \ firm \uparrow by\ 0.2\ mill$$

$$When\ \ firm\ was\ unlevered,$$

$$Niles\ owned = \frac{30{,}000}{20{,}000{,}000} = 0.15\%\ of\ \ firm$$

$$Daphne\ \ owned = \frac{75{,}000}{20{,}000{,}000} = 0.375\%\ of\ \ firm$$

$$Their\ wealth\ will \uparrow\ proportionately$$

$$\uparrow in\ Niles\ wealth = 0.15\% \times 0.2\ mill = 300$$

$$\uparrow in\ Daphne's\ wealth = 0.375\% \times 0.2\ mill = 750$$