Directions:

This take-home problem set (THPS) is due at the beginning of the regular class in week 6, and has to be turned in physically. Please do not send your answers via e-mail since any electronically turned in THPS will not be graded.

Although you may use your book, notes, etc., all work on this THPS is to be yours alone - any discussion of either the questions on the assignment or your answers with anyone other than the instructor will be considered as cheating and, thus, as a violation of the GSU honor code. You have to confirm your adherence to those rules by signing the attached academic honesty statement.

For all the multiple choice questions, record the letter of the correct multiple choice answer directly on the answer sheet on the last page. Also, record your final numeric answer including relevant calculations and intermediate steps on separate sheets of paper. Partial credit may be assigned at the instructor's discretion for these problems.

The grade on any assignment turned in after the beginning of class on the relevant date listed above will be reduced at a daily compounded rate of 10% per day (begin mode).

Following:

- Multiple choice questions (pp. 2-6)
- Statement of academic honesty (p. 7) to be signed and turned in together with the solutions
- Cover sheet with answers to Part I (p. 8) to be turned in with detailed solutions on separate sheets of paper
Multiple Choice Questions (each question is worth one point)

The following information pertains to questions 1-4.

Liquid Energy, Inc produces sports drinks under the brand name Verve. The company currently bottles and sells 200,000 sports drinks a year at $1.50 per bottle. The company is considering replacing the current equipment with new state-of-the-art equipment that can increase manufacturing capacity to 300,000 bottles per year, and it expects to sell all 300,000 bottled sports drinks each year. Furthermore, if the company buys the new equipment, its overall costs (includes both fixed and variable costs) will decline by $50,000 every year. The new equipment is expected to cost $880,000 and has an expected life of 5 years. It will be depreciated using 5-year MACRS (rates are 20%, 32%, 19.2%, 11.5% and 11.5% in years 1-5). If the new equipment is purchased, it will need to be modified before production begins, and it is expected that this modification cost of $20,000 can be capitalized. At the end of the project life, the new equipment is expected to be sold for $50,000.

The current equipment was purchased 3 years ago at a price of $500,000 and has a remaining life of 5 years. The equipment is being depreciated using straight-line depreciation towards a salvage value of $10,000. If sold today, the current equipment is expected to fetch $350,000. Working capital needs are expected to increase by $10,000 in year 0, and will be completely recovered at the end of 5 years. The beta of the company’s stock is 1.00, the risk-free rate is 5%, and the market risk premium is 6%. The corporate tax rate is 40%.

1. What is the net cash flow today if the new equipment is purchased?
   a. -$573,500
   b. -$563,500
   c. -$560,000
   d. -$593,750
   e. -$910,000

2. What is the cash flow in year 1 if the new equipment is purchased?
   a. $137,500
   b. $192,000
   c. $167,500
   d. $347,500
   e. $176,300
3. What is the net cash flow (includes both operating and non-operating cash flows) in year 5 if the new equipment is purchased?
   a. $177,780
   b. $187,780
   c. $197,780
   d. $186,020
   e. $190,320

4. What are the required rate of return and the NPV of the replacement decision?
   a. 5%; $14,463
   b. 11%; $26,332
   c. 11%; $70,397
   d. 11%; $20,397
   e. 6%; $120,312

The following information pertains to questions 5-7.

You are considering a project that costs $1050. If the product is a success (probability of success = 0.5), cash flows will be $200 per year in perpetuity. If it is a failure, the cash flows will be $0 per year in perpetuity. Assume a discount rate of 10%. Round all answers to the nearest dollar.

5. What is the expected NPV of the project?
   a. -$850
   b. $50
   c. -$50
   d. -$950
   e. $950

6. At the end of the first year, you will learn more about the economic viability of the project. If the project is a failure, the firm will sell off its assets for a scrap value of $500. What is the NPV of the project given the additional information?
   a. $752
   b. $300
   c. $177
   d. $200
   e. $350
7. What is the value to the company of the abandonment option?
   a. $227  
   b. $127  
   c. $350  
   d. $250  
   e. $150

8. You are in the process of constructing a well-diversified portfolio. You are considering whether to include either Asset A or Asset B to this portfolio. The two securities under consideration both have an expected return equal to 12 percent (computed using the current market price and the future stream of expected cash flows). However, the distribution of possible returns associated with Asset A has a standard deviation of 12 percent, while Asset B's standard deviation is 8 percent. The correlation of Asset A with the market is 0.50, while the correlation of Asset B with the market is 1.0. The standard deviation of the market is 10%. The risk-free rate is 6% and the expected risk-premium on the market is 8%. Which asset should the risk-averse investor add to his/her portfolio?
   a. Asset A  
   b. Asset B  
   c. Either A or B  
   d. The investors should refuse to add either security, as increasing the number of securities will reduce the total risk of the portfolio  
   e. Cannot tell without more information

9. If Mona invests 60% of her money in a common stock mutual fund with a beta of 1.25, and the rest of her money in T-bills, her total portfolio beta is:
   a. 0.00  
   b. 0.75  
   c. 1.00  
   d. 1.15  
   e. 1.25
10. The expected returns for Stock X and Stock Y are given below:

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<tr>
<th>Probability</th>
<th>Stock X Return</th>
<th>Stock Y Return</th>
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<tbody>
<tr>
<td>0.1</td>
<td>-20%</td>
<td>10%</td>
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<tr>
<td>0.8</td>
<td>20%</td>
<td>15%</td>
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<tr>
<td>0.1</td>
<td>40%</td>
<td>20%</td>
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If you form a 50-50 (equal weights in the two assets) portfolio of the two stocks, what is the portfolio’s expected return and standard deviation?

a. 15.00%; 8.06%
b. 18.00%; 13.58%
c. 16.50%; 8.06%
d. 15.00%; 2.24%
e. 16.50; 13.58%

11. You hold a diversified portfolio consisting of a $10,000 investment in each of 10 different common stocks. The portfolio beta is equal to 1.20. You have decided to sell one of your stocks, a consumer durable stock whose beta is equal to 0.5, for $10,000 net and to use the proceeds to buy $10,000 of stock in a software company whose beta is equal to 2.0. What will be the new beta of the portfolio?

a. 1.10
b. 1.40
c. 1.20
d. 1.25
e. 1.35

The following information pertains to questions 12-15.

Liquid Energy, Inc has a target capital structure that calls for 30% debt, 20% preferred stock, and 50% common equity. The company's current before-tax cost of debt is 10%, and it can sell as much debt as it wishes at this rate. The company's preferred stock currently sells for $110 a share and pays a dividend of $10 per share; however, the company will net only $100 per share from the sale of new preferred stock. Liquid Energy expects to retain $15,000 in earnings over the next year. Liquid Energy's common stock currently sells for $56 per share but the company will net only $50 per share from the sale of new common stock. The company recently paid a dividend of $3.00 per share on its common stock, and investor's expect it to grow indefinitely at a constant rate of 5% per year. The corporate tax rate is 40%.
12. What is the company's cost of retained earnings? [Note: There are no flotation costs for internal equity].
   a. 10.63%
   b. 10.36%
   c. 11.30%
   d. 11.00%
   e. 11.63%

13. What is the company's cost of newly issued common stock?
   a. 10.63%
   b. 10.36%
   c. 11.30%
   d. 11.00%
   e. 11.63%

14. What is the company's cost of newly issued preferred stock?
   a. 10.00%
   b. 6.00%
   c. 8.00%
   d. 5.45%
   e. 9.09%

15. What will be the WACC if the firm needs to issue new equity?
   a. 9.12%
   b. 9.45%
   c. 10.65%
   d. 10.32%
   e. 11.00%
Statement of Academic Honesty
(to be turned in together with the answer sheet)

I understand that

a) the GSU Graduate Catalog contains the policy on “Academic Honesty” on pages 53-57, which contains, among other things, statements regarding unauthorized collaboration, falsification, and multiple submissions. (A pdf-version of the GSU Academic Honesty Policy can be found at [http://www.gsu.edu/~wwwreg/013grad/008gc-acad%20regs.pdf](http://www.gsu.edu/~wwwreg/013grad/008gc-acad%20regs.pdf))

b) the instructions for this Take-Home-Problem Set (THPS) read, in part:

> Although you may use your book, notes, etc., all work on this THPS is to be **yours alone** - any discussion of either the questions on the assignment or your answers with anyone other than the instructor will be considered as cheating and, thus, as a violation of the GSU honor code.

I acknowledge that I have read and that I understand the above statements and I confirm my adherence to those rules.

Student Name (please print): ........................................................................
SSN: ................................................................................
Instructor: ................................................................................

-----------------------------------------------------------------  ------ -----------------------------
Signature of Student Date
MBA 8230
Applications in Corporate Finance

Take-Home Problem Set: Answer Sheet

Instructors:
Genna Brown, Naveen Daniel, Richard Fendler, Charles Hodges, Omesh Kini, Lalitha Naveen, and Milind Shrikhande

Name: …………………………………………………….

Total: ...... /15

Grade: ............ of 100

Multiple Choice Answers

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