Instructions:
1) The part of the exam is closed book and closed notes. No scrap paper is allowed; use the back of the exam if necessary.
2) Partial points are based on readily observable evidence that you know at least part of the solution concept. The more evidence presented (and the clearer the evidence), the better the chance for partial points. In other words, SHOW ALL WORK!
3) Multiple Choice are worth 3 points each. True False are worth 2 point each. Short answer questions are worth 4 points each. Problems are worth the number of points listed in the question.

1. The goal of the a firm’s managers is generally presumed to be to maximize the value of the firm’s stock.
   a. True    b. False

2. (6 points) The overall process of capital budgeting can be broken down into five steps as a project moves from idea to reality. Name these five steps. Describe which step you think is most important.
   1.
   2.
   3.
   4.
   5.
   Most important =
   Why?

3. (4 points) Match the Capital Budgeting method with the assumed reinvestment rate (answers may be used more than once).
   a. Net Present Value__________________
   b. Internal Rate of Return__________________
   c. Payback Period__________________
   d. Profitability Index__________________
   a. Internal Rate of Return    b. Cost of Capital
   c. Return on Investment    d. Return on Equity
   e. None of the above.

4. What is the best Capital Budgeting Decision Rule? Why?
5. You have a choice between 2 mutually exclusive investments. If both projects have positive NPVs at your required return of 14%, which investment should you choose?

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>Cash Flow</td>
<td>Cash Flow</td>
</tr>
<tr>
<td>0</td>
<td>-$50,000</td>
<td>-$100,000</td>
</tr>
<tr>
<td>1</td>
<td>+$10,000</td>
<td>+$20,000</td>
</tr>
<tr>
<td>2</td>
<td>+$30,000</td>
<td>+$60,000</td>
</tr>
<tr>
<td>3</td>
<td>+$50,000</td>
<td>+$100,000</td>
</tr>
</tbody>
</table>

a. Project B because it has a higher NPV.
b. Project A because it has a smaller initial investment.
c. Either one, they are both good investments.
d. You cannot choose because the internal rates of return are the same.
e. Not enough information to choose between the two projects.

Consider the following possible problems that arise in using alternative capital budgeting decision rules, such as IRR or NPV, etc. Then, in the next three problems, choose the problems associated with the technique identified.

I. Ignores time value of money
II. Ignores the more distant flows
III. May give ambiguous results, e.g., multiple answers
IV. May not correctly distinguish among mutually exclusive projects

6. What are the problems associated with IRR?
a. II only.
b. III only.
c. III and IV only.
d. I, II and III only.
e. none of the above

7. What are the problems associated with NPV?
a. II only.
b. III only.
c. III and IV only.
d. I, II and III only.
e. none of the above

8. What are the problems associated with Payback Period?
a. II only.
b. III only.
c. III and IV only.
d. I, II and III only.
e. none of the above

9. Soft capital rationing refers to the rationing imposed externally by limited funds for borrowing from outside sources.
a. True  b. False

10. When an estimate excludes inflation, it is said to be stated in __________.
    A. real terms     B. risky terms
    C. nominal terms   D. safe terms
    E. none of the above

11. Which of the following is considered the most important responsibility of the financial managers of a corporation?
    a. liquidity management  b. operations management
    c. capital budgeting      d. capital structure
    e. dividend policy

12. In plain English (i.e., as if you explaining this to a marketing major), explain what it means to say “the PI equals 1.52.”
13. Briefly define a “real option.” How do real options change the calculation of a project’s NPV?

14. (2 points each) Real Options – fill in the blanks. If you need to describe the option more fully, write your description near the question. For the record, the type of option is either call or put. The underlying asset refers to the item, which upon a change in value, will affect the decision to exercise or not exercise the option. If you need to make assumptions to answer the question, write your assumptions beside the question.

a. A friend is taking FI 4531 next term. You make a binding offer to sell your FI 4531 textbook for $50.
Type _______ Who is long ___________ Who is short ___________ Underlying Asset ___________

b. You work at a department store. A different friend, who always follows through on his commitments, asks you to steal some clothes from the store. He offers to pay you $300 for the clothes if you can steal them by next Tuesday.
Type _______ Who is long ___________ Who is short ___________ Underlying Asset ___________

c. You attempt to steal the clothes, but are caught by the Assistant Manager. The last five people to be caught stealing all went to jail for at least 6 months. The Manager offers to forget the whole thing if you can “hook up” at a dance club later than evening. While the Manager has often been accused of sexual harassment, the Manager has never been known to lie.
Type _______ Who is long ___________ Who is short ___________ Underlying Asset ___________

d. While at the dance club, you are somewhat surprised to find out that the always-truthful Assistant Manager wants to do more than just dance. Perhaps more surprising is you find yourself madly in love with the Assistant Manager. Even more shocking, the Assistant Manager is a multi-millionaire from the two months they spent at dot.com five years ago. The Assistant Manager asks you to run away with them and live happily ever after.
Type _______ Who is long ___________ Who is short ___________ Underlying Asset ___________
Instructions:
1) The part of the exam is open book and open notes.
2) Point values are listed with the question.
3) Show your work in order to have the possibility of partial credit.

1) (12 points) The following series of cash flows occur for t = 0, 1, 2, 3, 4, 5, and 6, respectively: -$285,500, $108,500, $108,500, $108,500, $68,500, $68,500, and $108,500. The appropriate risk-adjusted discount rate is 8%.

What is the NPV?

What is the IRR?

What is the payback period?

What is the Profitability Index?

2. (6 points) Consider the projects shown below. If you were hard capital rationed to $100 for the initial investment, which project(s) should you choose?

<table>
<thead>
<tr>
<th>Project:</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Cost:</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>30</td>
<td>35</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>NPV:</td>
<td>2.0</td>
<td>3.5</td>
<td>3.6</td>
<td>3.2</td>
<td>2.8</td>
<td>3.8</td>
<td>4.2</td>
<td>.7</td>
<td>.9</td>
</tr>
</tbody>
</table>
3. (20 points) International Plastics, Inc. (IP) currently produces molded plastics with an injection-molding unit it purchased several years ago. The unit, which originally cost $500, currently has a book value of $250. IP is considering replacing the existing unit with a newer, more efficient one. The new unit will cost $700 and will require an additional $50 for delivery and installation. The new unit will also require IP to increase its inventory levels by $40. The new molding unit will be depreciated on a straight-line basis over 5 years to a zero balance. IP could sell the existing unit for $375 today, while the existing unit would be worthless in 5 years. If IP purchases the new unit, annual revenues are expected to increase by $100 (due to increased processing capacity), and the annual operating costs (exclusive of depreciation) are expected to decrease by $20. Annual revenues and operating costs are expected to remain constant at this new level over the 5-year life of the project. After 5 years, the new unit will be completely depreciated and is expected to be sold for $70. Assume that the existing unit is being depreciated at a rate of $50 per year. The firm’s tax rate is 40% and its weighted average cost of capital (WACC) is 13%. Management classifies projects as low risk, average risk, or high risk. Depending on the project’s risk, the firm adjusts the cost of capital (up or down) by 2%. This project will be financed with bank debt estimated with a pre-tax cost of 10%. Since this is a new technology, management feels that this is a high-risk project.

(Fill in the blanks for 2 points) At a discount rate of _________% the NPV of this project is $___________. For 18 points show how the previous two answers are correct.
Montafiori Inc. has a target capital structure of 60% debt and 40% equity. The firm’s debt consists of 8 year, annually payable bonds with a coupon rate of 7%, and the bonds are actually traded at 106% of par value. Montafiori’s stock currently sells for $100 per share and the last dividend paid (=D₀) was $5.00. Investors expect the dividend to grow indefinitely at a constant rate of 10% per year. The company’s tax rate is 40%.

4. Calculate Montafiori’s after-tax cost of debt (in %, 2 decimal places)?
   a. 7.57%  b. 6.47%  c. 6.03%  d. 3.62%  e. 2.41%

5. Calculate Montafiori’s cost of equity (in %, 2 decimal places)?
   a. 11.50%  b. 12.75%  c. 15.00%  d. 15.50%  e. 16.25%

6. Calculate Montafiori’s WACC (in %, 2 decimal places)?
   a. 8.17%  b. 8.37%  c. 9.62%  d. 9.82%  e. 10.74%
Two friends are considering opening a driving range for golfers. Because of the popularity of golf, they estimate that they could rent 20,000 buckets at $3 a bucket in the first year, and that rentals will grow by 750 buckets a year thereafter. The price will remain at $3 per bucket for the life of the project. Equipment, listed below, is 5-year MACRS and is expected to have a salvage value of 10% of cost after 6 years. Expenditures for balls and buckets are $3,000 for year 1. The cost of replacing balls and buckets will grow at 5% per year (e.g. $3150 in year 2). Net working capital needs are $3,000 to start. The relevant tax rate is 15 percent. The required rate of return is 15 percent. The Equipment Requirements are; a Ball Dispensing Machine at 2,000, a Tractor and Accessories at 8,000, a Ball Pickup Machine at 8,000, for a Total or 18,000. The Operating Costs per Year are; Land Lease at 12,000, Water at 1,500, Electricity at 3,000, Seed & Fertilizer at 2,000, Labor (Salaried) at 30,000, Gasoline at 1,500, Maintenance at 1,000, Insurance at 1,000, Miscellaneous at 1,000, for a Total of 53,000.00. The friends will finance the 18,000 in equipment with a bank loan that has a 6% interest rate. The loan is to be repaid when the project ends in 6 years. In addition, at the end of year 3, the company will begin to pay a total dividend to your friends of $2,000 and this amount will increase by $1,000 per year until the project ends.

Evaluate the project for 6 years. Should your friends proceed with the project?
Phonemate, a manufacturer of telephone accessories, recently hired you as a financial analyst. A group of engineers reported to Phonemate's senior management that in their spare time they had developed an intelligent phone answering machine that could respond to simple questions. Businesses or individuals could load it with answers to the 20 most frequently asked questions, such as When do you close? What is your address? and so on, and the machine could then respond to those questions. Better yet, this machine could be produced for about $100. You have been asked to evaluate the viability of bringing this product to market.

Your first task is to gather data. From marketing you learn that Phonemate should be able to sell 43,000 units the first year if they are priced at $225 each. You expect sales to increase 10% per year for 5 years, then to stop when a new product will be introduced.

The firm will have to set up a new production line to make the machines. This is projected to cost $1.5 million. The line will be depreciated using the 5-year MACRS. Inventories will increase by $125,000. You learn that the engineers’ cost to develop the machine was $75,000, including time and parts. When this project is over, the production line will be sold for book value.

If this project is accepted, the firm will discontinue production of the old answering machines it currently sells. This will require the removal of its production line. This line was set up 2 years ago at a cost of $750,000 and is being depreciated using 5-year MACRS. The old line can be sold for $100,000. Revenues from the old answering machine are currently $2.5 million per year and costs are $0.5 million.

Advertising for the new answering machines is projected to be $2 million per year. Repairs and returns should be $1.5 million per year. The $100 per unit engineers' estimate of production costs includes wages, electrical utilities, and all other costs of manufacturing.

The firm's tax rate is 40% and its cost of capital is 13%. Since this is a new technology, management feels that the cash flows should be discounted at 15%. This project will be financed with bank debt estimated to cost 10%.

a. Prepare a cash flow analysis.

b. Calculate the NPV and IRR.