I. Multiple-choice Questions (Each counts 2.5%. Total = 45%) 

1. If the chance of a slump is 35%, the chance of normal times is 25%, and the chance of a boom is 40%. What is the expected payoff from an investment which offers the following payoffs?

<table>
<thead>
<tr>
<th>Slump</th>
<th>Normal</th>
<th>Boom</th>
</tr>
</thead>
<tbody>
<tr>
<td>$100</td>
<td>$300</td>
<td>$500</td>
</tr>
</tbody>
</table>

A) $200  B) $400  C) $800  D) none of the above

2. Consider a bond with a face value of $1,000, a coupon rate of 6 percent (with annual coupon payments), and a yield of 6 percent. The price of the bond is:

A) less than $1,000.  B) equal to $1,000.
C) greater than $1,000.  D) none of the above.

3. How much is $100 worth at the end of 4 years if invested at a continuously compounded rate of 10 percent a year?

A) $143.60  B) $146.40  C) 149.20  D) $317.00

4. To calculate present value, we discount by a rate of return that is known as the:

A) opportunity cost of capital.  B) hurdle rate.
C) discount rate.  D) all of the above.

5. If stock A has a 40% chance of gaining 20% and a 60% chance of losing 10%, the expected return of stock A is:

A) 20%  B) -10%  C) 2%  D) 14%
6. The opportunity cost of capital for a project is the

A) expected rate of return on government securities having the same maturity as the project.
B) expected rate of return on a well-diversified portfolio of common stocks.
C) expected rate of return demanded by investors in securities subject to the same risks as the project.
D) none of the above.

7. The projected cash flows from a proposed investment are:

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$100</td>
</tr>
<tr>
<td>2</td>
<td>$200</td>
</tr>
<tr>
<td>3</td>
<td>$500</td>
</tr>
</tbody>
</table>

This project costs $500. What is the payback period for this investment?

A) 2 years    B) 2.4 years    C) 2.5 years    D) 3 years

8. If stock B has a 70% chance of gaining 40% and a 30% chance of losing 20%, the standard deviation of return of stock B is around:

A) 0%    B) 27%    C) 31%    D) 35%

9. Based on the internal rate of return (IRR) rule, an investment is acceptable if the IRR is

A) less than the required return.
B) equal to the required return.
C) greater than the required return.
D) none of the above.
10. The weighted average cost of capital (WACC) is the weighted average of

A) the cost of equity and the cost of debt.
B) the cost of equity and the pretax cost of debt.
C) the cost of equity and the aftertax cost of debt.
D) none of the above.

11. _______ risk reduction is achieved when the returns on two securities _______ so that their correlation is -1.

A) Minimum, move exactly opposite to each other
B) Minimum, move together
C) Maximum, move exactly opposite to each other
D) Maximum, move together

12. Refer to the following information, what is the expected return for stocks X and Y?

<table>
<thead>
<tr>
<th></th>
<th>Bear Market</th>
<th>Normal Market</th>
<th>Bull Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability</td>
<td>0.2</td>
<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>Stock X</td>
<td>-20%</td>
<td>18%</td>
<td>50%</td>
</tr>
<tr>
<td>Stock Y</td>
<td>-15%</td>
<td>20%</td>
<td>10%</td>
</tr>
</tbody>
</table>

A) 18% for stock X and 5% for stock Y
B) 18% for stock X and 12% for stock Y
C) 20% for stock X and 11% for stock Y
D) 20% for stock X and 10% for stock Y

13. Refer to Question 12. What is the standard deviation of returns on stocks X and Y?

A) 15% for stock X and 26% for stock Y
B) 20% for stock X and 4% for stock Y
C) 24% for stock X and 13% for stock Y
D) 28% for stock X and 8% for stock Y
14. If a firm's beta increases, the market value of its stock
   A) does not change    B) increases    C) decreases
   D) insufficient information to answer this question

15. If X is the strike price and S(T) is the final price of the underlying asset, the payoff from a long position in a European call option is
   A) max[ S(T) - X, 0 ]    B) max[ X - S(T), 0 ]
   C) min[ S(T) - X, 0 ]    D) min[ X - S(T), 0 ]

16. Which of the following is correct?
   A) Forward contracts are traded on an exchange.
   B) Futures contracts are traded on an exchange.
   C) Both forward and futures contracts are traded on an exchange.
   D) Both forward and futures contracts are not traded on an exchange.

17. Which of the following is NOT a systematic risk factor?
   A) market risk            B) business risk  C) inflation risk  D) interest rate risk

18. Using the security market line, an investor owning a stock with a beta of -1.5 would expect the stock's return to ________ in a market that was expected to decline by 10%.
   A) fall by 1.5%          B) fall by 15%   C) rise by 15%   D) rise by 1.5%
II. Multiple-choice Questions  (Each counts 4%. Total = 20%)

1. The Capital Asset Pricing Model (CAPM) states that a stock has the same market risk and expect return as

A) a portfolio evenly divided between the market and risk-free Treasury bills.
B) a portfolio with proportions $\beta$ invested in Treasury bills and $(1-\beta)$ in the market.
C) a portfolio fully invested in the market, with short-selling of Treasury bills.
D) a portfolio with proportions $\beta$ invested in the market and $(1 - \beta)$ in Treasury bills.

2. You manage an equity fund with an expected risk premium of 10% and a beta of 1.4. The rate on Treasury bills is 6%. Your client chooses to invest $60,000 of her portfolio in your equity fund and $40,000 in a Treasury bill money market fund. What is the expected return and beta on your client's portfolio?

A) expected return = 8.4%  beta = 0.84
B) expected return = 8.4%  beta = 1.40
C) expected return = 12%  beta = 0.84
D) expected return = 12%  beta = 1.40

3. Refer to Question 2. What is the reward-to-risk ratio for the equity fund?

A) 7.1%  B) 10%  C) 11.9%  D) 19.1%

4. Which of the following portfolios CANNOT lie on the efficient frontier as described by Markowitz?

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Expected Return</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) W</td>
<td>5%</td>
<td>7%</td>
</tr>
<tr>
<td>B) X</td>
<td>9%</td>
<td>20%</td>
</tr>
<tr>
<td>C) Y</td>
<td>15%</td>
<td>36%</td>
</tr>
<tr>
<td>D) Z</td>
<td>12%</td>
<td>15%</td>
</tr>
</tbody>
</table>
5. **Stock** | **Expected Return** | **Beta**
---|---|---
H | 12.0% | 0.9
I | 17.0% | 1.5
J | 16.3% | 1.8
K | 11.4% | 0.8

If the risk-free rate is 7.5% and the expected return on the market is 12.5%, which of the following statements is true?

A) Stock H is undervalued in the market  
B) Stock I is overvalued in the market  
C) Stock J is overvalued in the market  
D) Stock K is undervalued in the market

III. Long Questions  (You may answer either in English or in Chinese. Total = 35%)

1. What are the differences between Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT)? (15%)

2. What are systematic and nonsystematic risks? How are these two risks related to diversification? (10%)

3. The following statement is quoted from Fischer Black's paper(1989): "... the expected return on a warrant (call option) should depend on the risk of the warrant in the same way that a common stock's expected return depends on its risk ..." Explain the meaning of the above statement in relation to the concept of risk neutrality. (10%)