FACULTY OF COMMERCE
DEPARTMENT OF FINANCE
MSC FINANCE AND INVESTMENTS
PART I 2ND SEMESTER FINAL EXAMINATION– MAY 2012
INVESTMENT ANALYSIS [CFI 5104]
TIME ALLOWED: 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Answer **ANY FOUR (4)** questions.
2. Write neatly and legibly.

INFORMATION TO CANDIDATES

1. The paper contains **SIX (6)** Questions.
2. Each full question carries a total of **25 marks** and part marks are indicated in brackets at the end of each part question.
3. Candidates may write on the question paper but shall not write in the answer booklet during reading time.
4. The businesses in this question paper are intended to be fictitious

QUESTION ONE [25 MARKS]

1.1   A pension fund manager is considering three mutual funds. The first is a stock fund, the second is a long-term government and corporate bond fund, and the third is a T-bill money market fund that yields a rate of 8%. The probability distribution of the risky funds is as follows:

	Expected Return	Standard Deviation
Stock Fund (S)	20%	30%
Bond Fund (B)	12%	15%

The correlation between the fund returns is **.10**

(a) Solve numerically for the proportions of each asset and for the expected return and standard deviation of the optimal risky portfolio. [3; 1; 2 marks]

(b) What is the reward-to-variability ratio of the best feasible capital allocation line (CAL)? [2 marks]

(c) You require that your portfolio yield an expected return of 14%, and that it be efficient, on the best feasible CAL.

    (i)   What is the standard deviation of your portfolio? [2 marks]

    (ii)   What is the proportion invested in the T-bill fund and each of the two risky funds? [5 marks]

(d) If you were to use only the two risky funds, and still require an expected return of 14%, what would be the investment proportions of your portfolio? Compare its standard deviation to that of the optimized portfolio in (c). What do you conclude? [5 marks]

1.2   Create a well labeled diagram that clearly demonstrates how the optimal portfolio choice of defensive investors differs from that of aggressive investors, given differential borrowing and lending rates. [3 marks]

1.3   A portfolio has an expected rate of return of 20% and standard deviation of 30%. T-bills offer a safe rate of return of 7%. Would an investor with risk-aversion parameter A=2 prefer to invest in T-bills or the risky portfolio? [2 marks]

QUESTION TWO [25 MARKS]

2.1   An investor's portfolio currently is worth $1.5 million. During the year, the investor sells 1,500 shares of Stargate at a price of $120 per share and 3,000 shares of Moongate at a price of $60 per share. The proceeds are used to buy 2,400 shares of Sungate at $150 per share.

(a) What was the portfolio turnover rate? [2 marks]

(b) If Stargate shares originally were purchased for $105 each and those in Moongate were purchased for $53, and the investor's tax rate on capital gains income is 20%, how much extra will the investor owe on this year's taxes as a result of these transactions? [3 marks]

2.2   Suppose that you sell short 500 shares of Litma, currently selling for $40 per share, and give your broker $15,000 to establish your margin account.

(a) If you earn no interest on the funds in your margin account, what will be your rate of return after one year if Litma's stock is selling at (i) $44, (ii) $36? Assume that Litma pays no dividends. Interpret your results.   [5 marks]

(b) If the maintenance margin is 25%, how high can Litma's price rise before you get a margin call?   [2 marks]

(c) Recalculate parts (a) and (b) but now assume that Litma also has paid a year-end dividend of $1 per share. The prices in part (a) should be interpreted as ex-dividend.
                                                                        [6 marks]

2.3   Provide two reasons why it is contended that bond-market indexes are more difficult to construct and maintain than stock-market indexes.   [2 marks]

2.4   Five years ago we invested $150,000 in a fund we thought would earn a geometric return of 8% over a 20-year horizon so that at the end of the horizon we would receive $699,143.57. During the past 5 years, however, the fund's geometric return was only 6.5%. What must its geometric return be for the next 15 years if we are to reach our original goal of $699,143.57?   [2 marks]

2.5   In looking at the frequency distribution of weekly crude oil price changes between 1984 and 2008, an analyst notices that the frequency distribution has a surprisingly large number of observations for extremely large positive price changes and a smaller number, but still a surprising one, of observations for extremely large negative price changes. The analyst provides you with the following statistical measures:
- Serial correlation of weekly price changes
- Variance of weekly price changes
- Skewness of weekly price changes
- Kurtosis of weekly price changes.

Which measures would help you identify these characteristics of the frequency distribution? Briefly explain your answer.   [3 marks]

QUESTION THREE [25 MARKS]

3.1   Jairos Phiri is a portfolio manager at NUST & Associates. For all of his clients, Phiri manages portfolios that lie on the Markowitz efficient frontier. Phiri asks Bridgit James, a managing director at NUST & Associates, to review the portfolios of two of his clients, the Tiger Manufacturing Company and the Emporium Life Insurance Company. The expected returns of the two portfolios are substantially different. James determines that the Emporium portfolio is virtually identical to the market portfolio and concludes that the Emporium portfolio must be superior to the Tiger portfolio.

(a) Do you agree or disagree with James's conclusion that the Emporium portfolio is superior to the Tiger portfolio? Justify your response with reference to the capital market line.   [4 marks]

(b) Phiri remarks that the Emporium portfolio has a higher expected return because it has greater nonsystematic risk than Tiger's portfolio. Define nonsystematic risk and explain why you agree or disagree with Phiri's remark.   [4 marks]

3.2   Maria Khari, a portfolio manager at Noble Asset Management, is using the capital asset pricing model for making recommendations to her clients. Her research department has developed the information shown in the following exhibit.

<u>Forecast Return, Standard Deviations, and Betas</u>

	Forecast Return	Standard Deviation	Beta
Stock X	14.0%	36%	0.8
Stock Y	17.0%	25%	1.5
Market index	14.0%	15%	1.0
Risk-free rate	5.0		

(a) Compute the alpha for each stock.   [3 marks]
(b) Identify and justify which stock would be more appropriate for an investor who wants to
       (i)   add this stock to a well-diversified equity portfolio.   [1½ marks]
       (ii)   hold this stock as a single-stock portfolio.   [1½ marks]
(c) Assume that the risk-free rate increases to 7% with the other data remaining unchanged. Select the stock providing the higher expected risk-adjusted return and justify your selection.   [4 marks]

3.3   Suppose that two factors have been identified for the Utopia economy: the growth rate of industrial production (IP), and the inflation rate (IR). IP is expected to be 3%, and IR 5%. A stock with a beta of 1.0 on IP and 0.5 on IR currently is expected to provide a rate of return of 12%. If industrial production actually grows by 5%, while inflation rate turns out to be 8%, what is your revised estimate of the expected rate of return on the stock.
                                                                    [3 marks]

3.4   Suppose that the market can be described by the following three sources of systematic risk with associated risk premiums.

Factor	Risk Premium
Industrial production (I)	6%
Interest rates (R)	2%
Consumer confidence (C)	4%

The return on a particular stock is generated according to the following equation:
    $R = 15\% + 1.0I + .5R + .75C + e$

The T-bill rate is 6%.

Find the equilibrium rate of return on this stock using the APT. Is the stock over- or under-valued? Explain.   [4 marks]

QUESTION FOUR [25 MARKS]

4.1 Prices of long-term bonds are more volatile than prices of short-term bonds. However, yield-to-maturity of short-term bonds fluctuates more than yields of long-term bonds. How do you reconcile the two empirical observations? [4 marks]

4.2 Naome Cramp, a fixed income portfolio manager based in the country of Gazania, is considering the purchase of a Gazania government bond. Cramp decides to evaluate two strategies for implementing his investment in Gazania bonds. Table 4A gives the details of the two strategies and Table 4B contains the assumptions that apply to both strategies.

Table 4A – Investment Strategies (amounts are market value invested)

Strategy	5-year Maturity (Modified Duration=4.83)	15-year Maturity Modified Duration=14.35)	25-year Maturity (Modified Duration=23.81)
I	$5 million	0	$5 million
II	0	$10 million	0

Table 4B – Investment Strategy Assumptions

Market value of bonds	$10 million
Bond maturities	5 and 25 years or 15 years
Bond coupon rates	0.00% (zero coupon)
Target modified duration	15 years

Before choosing one of the two bond investment strategies, Cramp wants to analyze how the market value of the bonds will change if an instantaneous interest rate shift occurs immediately after his investment. The details of the interest rate shift are shown in Table 4C.

Table 4C - Instantaneous Interest Rate Shift Immediately after Investment

Maturity	Interest Rate Change
5 year	Down 75 basis points (bps)
15 year	Up 25 bps
25 year	Up 50 bps

Required

Calculate, for the instantaneous interest rate shift shown in Table 4C, the percentage change in the market value of the bonds that will occur after each strategy. [5 marks]

4.3 A client is reviewing a year-end portfolio report. Since the beginning of the year, market yields have increased slightly. In comparing the beginning-of-the-year prices for the bonds selling at a discount from par value to the end-of-the-year prices, the client observes that all the prices are higher. The client is perplexed since he expects that the price of all bonds should be lower since interest rates increased. Explain to the client why the prices of bonds in the portfolio selling at a discount have increased in value.

[6 marks]

4.4 How would you expect yield spreads to respond to the following macroeconomic events: recession, high inflation, tax cuts, stock market decline, improved trade balance? Explain the reasoning behind each of your answers. [10 marks]

QUESTION FIVE [25 MARKS]

5.1 Dynamic Research is initiating coverage of a mature manufacturing industry. Chris Cross, head of the research department, gathered the following fundamental industry and market data to help in his analysis:

Forecast industry earnings retention rate	40%
Forecast industry return on equity	25%
Industry beta	1.2
Government bond yield	6%
Equity risk premium	5%

(a) Compute the price-to-earnings (P/E) ratio for the industry based on this fundamental data. [4 marks]

(b) Cross wants to analyse how fundamental P/E ratios differ among countries. He gathered the following economic and market data:

Fundamental Factors	Country A	Country B
Forecast growth in real GDP	5%	2%
Government bond yield	10%	6%
Equity risk premium	5%	4%

Determine whether each of these fundamental factors would cause P/E ratios to be generally higher for country A or higher for country B. [6 marks]

5.2 The following financial statements are extracted from the records of Cyclone Corporation.

	2007 $000	2011 $000
Income Statement Data		
Revenues	542	797
Operating Income	38	76
Depreciation and amortization	3	9
Interest expense	3	0
Pretax income	32	67
Income taxes	13	37
Net income after tax	19	30
Balance Sheet Data		
Fixed assets	41	70
Total assets	245	291
Working capital	123	157
Total debt	16	0
Total shareholders' equity	159	220

Required
Decompose Cyclone's return on equity using DuPont analysis. Further, discuss the impact of changes in asset turnover and financial leverage on the change in ROE from 2007 to 2011. [7 marks]

5.3(a) An investor is considering the purchase of 100 ordinary shares in Webb Entertainments PLC. Dividends from the shares will be paid annually. The next dividend is due in 6 months and is expected to be $1.60 per share. The second, third and fourth dividends are expected to be 25% greater than their predecessors; thereafter dividends are expected to grow at a constant rate of 5% per annum in perpetuity. Calculate the present value of the dividends if the investor's required rate of return is 14% per annum. [5 marks]

(b) Outline two weaknesses inherent in the Dividend Discount Model as a valuation approach. [3 marks]

QUESTION SIX [25 MARKS]

6.1 An economy is making a rapid recovery from a steep recession, and businesses foresee a need for large amounts of capital investment. Why would this development affect real interest rates? [3 marks]

6.2 Briefly explain why the index of consumer expectations is a useful leading indicator of the macroeconomy? [3 marks]

6.3 General Weedkillers Ltd dominates the chemical weed control market with its patented product, Weed-ex. The patent is about to expire, however. What are your forecasts for changes in the industry? Specifically, what will happen to industry prices, sales, the profit prospects of General Weedkillers, and the profit prospects of its competitors? What stage of the industry life cycle do you think is relevant for the analysis of this market? Explain your answer. [8 marks]

6.4 Despite the arguments and evidence offered by proponents of market efficiency, many investors pay attention to technical analysis in some form. Speculate as to why these investors use this kind of investment research. [6 marks]

6.5 "The behavior of stock prices can be likened to the walk of a drunken person." Respond. [5 marks]

END OF EXAMINATION PAPER