EXAM INSTRUCTIONS: Please record all answers in the examination book provided. Be as complete as possible in recording the calculations made to arrive at specific answers. Calculators with enhanced capabilities such as the ability to attach external drives, whether such drives are attached or not, are prohibited. Other than an admissible calculator, no books or other materials are permitted to be used during the examination.

Section I: Definitions (15 points)

Provide a brief description of the following (3 points each):

a) value weighted index b) zero beta portfolio c) riskfree interest rate
d) mean-variance expected utility function e) efficient frontier

Section II: Portfolio Management (50 points total)

1. Assuming the market model holds, explain why unsystematic risk is diversifiable while systematic risk is not diversifiable. Be sure to identify the relevant assumptions which are being made about the error terms and where these assumptions are used in your derivation. What is the standard deviation of a fully diversified portfolio?

(10 points)

2. You are considering investing offshore using a domestic equity fund and a foreign equity fund. The domestic fund has E[R] = .1 and F = .15. The foreign equity fund has $E[R_{\$}] = .12$ with $F_{£} = .18$ and $F_{e} = .03$. The correlation between the foreign and domestic fund returns is .4 and the correlations between either of the fund returns and the exchange rate are zero.

a) Calculate the portfolio variance for an equally weighted portfolios of these two funds.
b) Assume you are interested in minimizing the variance of portfolio returns, what portfolio weights for the two funds would be compatible with this objective? What is the expected return and variance of this minimum variance portfolio?
c) What combination of these two funds would maximize the Sharpe ratio? (Hint: consider a world with two securities, i.e., the foreign and domestic funds. In this world, the Sharpe ratio is maximized when the slope of the Capital Market Line is maximized.) What is the expected return and variance of this portfolio?

(20 points)

3. Assume the standard Capital Asset Pricing Model is true, e.g., there is unrestricted lending or borrowing at the same riskfree rate of interest. From your stock broker your are able to obtain the following information about two stocks:

	Expected Return	Beta
Stock (A)	.18	0.9
Stock (B)	.30	1.4

a) What is the riskfree interest rate? (5 points)
b) What is the expected return on the market portfolio? (5 points)
c) What are the equations for the Capital Market Line and the Security Market Line? (10 points)

Section III: Efficient Markets (20 points total)

1. Some authors argue that professional investment managers are incapable of outperforming the market. Others come to an opposite conclusion. Compare and contrast the assumptions about the stock market that support (i) passive portfolio management, and (ii) active portfolio management.

2. Dollar-cost averaging means that you buy equal dollar amounts of a stock every period, e.g., $X per month. The strategy is based on the idea that when the stock price is low, your fixed monthly purchase will buy more shares, and when the price is high, fewer shares will be purchased. Averaging over time, you will end up buying more shares when the stock is cheaper and fewer when it is relatively expensive. Therefore, by design, you will exhibit good market timing. Evaluate this strategy.

Section IV: Bond and Equity Pricing Models (15 points total)

1. Burnaby Air Cleaners (BAC) is a private company operating under an agreement among the shareholders to pay out a fixed fraction of earnings each year in the form of dividends. BAC has announced it intends to pay a $12 common stock dividend next year. It is estimated that the dividend will increase at 14% per year for 30 years. At that time, the company will be liquidated. Estimated breakup value of the company at that time is $520 per share. It is further estimated that stocks of similar risk are currently priced to provide an expected return of 10%.

a) What is the intrinsic value of one share of Burnaby Air Cleaners common stock?
b) What is the Macaulay duration of this security?
c) What is the elasticity of the stock price with respect to a change in the growth rate? Use your answer to estimate how much the stock price will change if the earnings growth rate changes 1%?