

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF COMMERCE

DEPARTMENT OF INSURANCE AND ACTUARIAL SCIENCE

B.COM (HONOURS) DEGREE IN RISK MANAGEMENT AND INSURANCE

INVESTMENT AND PORTFOLIO MANAGEMENT – CIN 4203

SECOND SEMESTER EXAMINATION – MAY 2011

TIME ALLOWED : 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Answer **ALL** Questions in **Section A** and any **TWO** from **Section B**.

INFORMATION FOR CANDIDATES

1. Section A carries a total of 50 marks and each Question in Section B carries 25 marks.

SECTION A (COMPULSORY)

Question One (50 marks)

- (a) Consider a fund which has the following asset class weights and returns relative to a benchmark portfolio:

Asset Class	Weight in Fund	Weight in Benchmark	Asset Class – Fund Return (%)	Asset Class Return- Benchmark (%)
Stock	0.50	0.60	9.70	8.60
Bonds	0.38	0.30	9.10	9.20
Cash	0.12	0.10	5.60	5.40

- (i) Analyze the performance of the fund, breaking down the performance into asset allocation effect and security selection effect. [6 marks]
- (ii) Interpret the analysis in (i) above. [4 marks]
- (b) An analyst has estimated the following return distributions for stocks A and B:

State of the economy	Probability	Return on A (%)	Return on B (%)
Boom	0.3	20	7
Normal	0.6	15	16
Slump	0.1	5	22

Using the information in the table above, determine:

- (i) The expected return and standard deviation of A and B. [4;6 marks]
- (ii) The covariance of returns for A and B. [3 marks]
- (iii) The correlation coefficient of returns of A and B. [2 marks]
- (iv) The expected return and standard deviation of a portfolio invested 40% in A and 60% in B. [2;3 marks]
- (v) The minimum variance portfolio comprising stocks A and B. [4 marks]
- (vi) The optimal portfolio of risky assets given that the risk free rate of return is 10%. [5 marks]
- (vii) The complete portfolio consisting of the optimal portfolio of risky assets and the risk free asset, given that the investor's risk aversion factor is 4. [6 marks]
- (viii) The expected return and standard deviation of the complete portfolio. [2;3 marks]

Total [50 marks]

SECTION B (Attempt Any Two)

Question Two

- (a) Consider a \$1000, 10% coupon bond that is issued at a price of \$962 and has a term to maturity of 5 years, with coupons payable annually.

Calculate:

- (i) The yield to maturity of the bond [3 marks]
- (ii) The Macaulay duration of the bond [4 marks]
- (iii) The Convexity of the bond [4 marks]
- (iv) The approximate change in the value of the bond following a decrease in yields to 10.5% [3 marks]
- (b) Explain how the following strategies are used in equity portfolio management:
- (i) Indexation [3 marks]
- (ii) Market timing [3 marks]
- (c) Evaluate the role of life cycle theory in the investment management process. [5 marks]
- Total [25 marks]**

Question Three

- (a) Identify and explain any **THREE** investor constraints that may be incorporated in an investment policy statement for a pension fund. [6 marks]
- (b) Critically analyze the implications of the Efficient Markets Hypothesis (EMH) in investment management. [5 marks]
- (c) Briefly outline Dow Theory as applied to technical analysis. [4 marks]
- (d) A regression analysis of returns on Stock B and the market index gives a beta value of 0.8 and standard error of the regression model of 15%. The standard deviation of market index returns is 20%. Determine the total risk of Stock B. [3 marks]
- (e) Given the information in (d) above, determine the equilibrium expected rate of return on Stock B if the risk free rate of return is 8%. [2 marks]
- (f) The actual return on Stock B above is 13%. Determine the alpha value and show Stock B on the Security Market Line diagram. Comment. [5 marks]
- Total [25 marks]**

Question Four

- (a) You are given the following information regarding the performance of two portfolios, A and B. A is a well-diversified portfolio held by a large pension fund and B is a portfolio of five stocks held by a small individual investor.

Portfolio	Return (%)	Standard deviation (%)	Beta
A	18	13	0.96
B	23	16	0.7
Benchmark	15	10	1.0
Risk Free	9	0	0

Given the information above, evaluate the performance of portfolios A and B. [6 marks]

- (b) Explain how an investor can arbitrage with convexity. [3 marks]
- (c) A pension fund expects to make annual payments of \$100 000 at the end of each of the next five years. There are two zero coupon bonds available, A and B, with maturities of five years and one year respectively. The annual effective rate of return is 5%. Determine the amounts that must be invested in each of the zero coupon bonds in order to fully immunize the portfolio from small changes in interest rates. [9 marks]
- (d) Explain the role of the investment policy statement in investment management. [4 marks]
- (e) Evaluate the use of the core-satellite strategy in portfolio management. [3 marks]

Total [25 marks]

*******END OF PAPER*******