

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**FACULTY OF COMMERCE**  
**BACHELOR OF COMMERCE HONOURS DEGREE IN FINANCE**  
**PART IV 1<sup>ST</sup> SEMESTER FINAL EXAMINATION – DECEMBER 2006**  
**INSTITUTIONAL INVESTMENT ANALYSIS [CFI 4103]**  
**TIME ALLOWED: 3 HOURS 10 MINUTES**

**INSTRUCTIONS**

1. **ATTEMPT ANY FIVE [5] QUESTIONS.**
2. **EACH QUESTION CARRIES 20 MARKS**

**QUESTION ONE**

An investment analyst of a pension fund has identified two portfolios of stocks, which had the following returns over the past five years:

	1	2	3	4	5
Portfolio 1	15%	0%	15%	30%	15%
Portfolio 2	22.5%	3.75%	22.5%	3.75%	22.5%

- (a) Find out the mean ex post returns ( $\bar{R}$ ) and standard deviation ( $\sigma$ ) of each of the portfolios. **[6 marks]**
- (b) Compute the correlation coefficient of Portfolio 1 and 2. **[3 marks]**
- (c) What is the minimum variance portfolio and what is its standard deviation? **[6 marks]**
- (d) Given a risk-free rate of 3%, what is the single ex post efficient portfolio of risky securities? **[2 marks]**
- (e) Given that portfolio 1 consists of stocks A and B whose correlation coefficient is 0.0, and that  $\sigma_B = 2\sigma_A$ ,  $\sigma_A = 10.6067\%$  and  $R_A = R_B = 15\%$ , what then are the optimal holdings in portfolio 1? **[3 marks]**

**QUESTION TWO**

**(20 marks)**

- (a) The portfolio manager for Joyride Investment Company is interested in two particular stocks: Megan Construction and Samson Pharmaceuticals. A three-factor Arbitrage Pricing Model (APM) holds and the risk free rate is 6 percent. The return on both stocks are related to economic factors as follows:

$$E(R_i) = 0.06 + b_{\text{interest rates}}(0.09) - b_{\text{inflation}}(0.03) + b_{\text{exchange rate}}(0.04)$$

The sensitivity coefficients for the two stocks are given below:

<b>Stock</b>	<b><math>b_{\text{interest rates}}</math></b>	<b><math>b_{\text{inflation}}</math></b>	<b><math>b_{\text{exchange rate}}</math></b>
Megan Construction	0.70	0.80	0.20
Samson Pharmaceuticals	0.50	0.04	1.20

(i) Compute the expected returns on both stocks. [5 marks]

(ii) Which stocks requires a higher return? Justify your answer. [3 marks]

(b) Annual returns for the Savanna Mutual Fund for various year are shown below:

<u>Year</u>	<u>Return</u>	<u>Year</u>	<u>Return</u>
1996	12.51	2001	24.12
1997	21.46	2002	6.43
1998	25.36	2003	30.12
1999	7.76	2004	18.43
2000	29.64	2005	4.61

(i) Prepare a unit value series from the above data. Of what use are these series of values to investment analysts? [7 marks]

(ii) Calculate the arithmetic average return and geometric average return and explain their use in analyzing investments. [5 marks]

**QUESTION THREE** (20 marks)

(a) Distinguish amongst investment, speculation and arbitrage. [6 marks]

(b) Examine the implications of the Efficient Market Hypothesis (EMH)  
(i) for technical analysis  
(ii) for money management. [6 marks]

(c) With reference to the Zimbabwe Stock Exchange, provide brief explanations of the significance of the following anomalies in market analysis:  
(i) Unexpected earnings, as represented by SUE  
(ii) The Neglected Firm Effect. [8 marks]

**QUESTION FOUR** (20 marks)

(a) Determine the convexity of a 3-year Bond, \$1 000 par value, carrying a 12 percent coupon and a 9 percent yield-to-maturity (YTM). [6 marks]

(b) A bond for Giga plc has the following characteristics:

Term-to-maturity	18 years
Coupon	12%
YTM	9%
Price	\$126.50
Modified Duration	8.38 (D*)
Convexity	107.70

Estimate the direction of change in the bonds price if the yield to maturity fell to 6 percent. Briefly explain the significance of your results. [8 marks]

- (c) Is there any scope for establishing a bond market in Zimbabwe? Give reasons for your answer. **[6 marks]**

**QUESTION FIVE**

**(20 marks)**

- (a) The following financial and stock market information has been extracted from Excel Ltd.

**Excel Ltd: Financial Statements for the Year Ended December 2005**

	<b>(\$000)</b>
Sales	7 200
Cash Expenses	(6 165)
Depreciation	<u>(225)</u>
Net Operating Income	810
Interest	<u>(150)</u>
Net Income before tax	660
Tax	<u>(300)</u>
Net Income	<u>\$360</u>
Dividends paid	<u>\$216</u>

<b><u>Assets</u></b>	<b>(\$000)</b>
Fixed Assets	2 320
Investments	180
Current Assets	<u>1 700</u>
<u>Total Assets</u>	<u>\$4 200</u>

<b><u>Equity and Liabilities</u></b>	<b>(\$000)</b>
Equity	2 400
Debt	<u>1 800</u>
	<u>\$4 200</u>

**Market Information as of December 2005**

Common Shares Outstanding	60 million
Price per share	\$18.22
Risk-free Rate	13.5%
Expected Return on the Market	21%
Estimated Beta	1.8

- (i) Determine what the required return on Excel should be using the Security Market Line. **[2 marks]**
- (ii) What is the sustainable growth rate which would exist if the financial relationships shown in the balance sheet and the income statements were to remain constant over time? **[3 marks]**
- (iii) Use the dividend valuation model to determine the fair market price of Excel Ltd. **[3 marks]**
- (iv) Would you buy this stock? Justify your answer. **[2 marks]**
- (v) What would a firm believer in efficient market theory say about your decision in part (iv)? **[2 marks]**

- (b) You have been following the performance of Shamrock Drug Company (SDC), which currently retains 40 percent of its earnings (\$5 a share this year). It earns a return on equity (ROE) of almost 30 percent.
- (i) Assuming a required rate of return of 14 percent, how would you pay for SDC on the basis of the earnings multiplier model? **[3 marks]**
  - (ii) What would you pay for SDC if its retention rate was 60 percent and its ROE was 19 percent? **[3 marks]**
  - (iii) Briefly explain the difference between your answer in (i) and (ii). **[2 marks]**

**QUESTION SIX**

**(20 marks)**

Discuss the significance of conducting industry life cycle analysis and business cycle analysis when analyzing an economy's industries. **[20 marks]**