UNIVERSITY OF PORTSMOUTH

FACULTY OF TECHNOLOGY

Department of Electronic and Computer Engineering

M591 – Technology Exploration Project

U13127

Date: 26 January 2009 **Time: 16:15 - 18:15**

INSTRUCTIONS

Write your student ID number clearly on page 2.

Write your answers to all 5 questions within the spaces provided in this examination paper.

Handwritten notes are permitted with this examination.

Calculators permitted are:

Casio FX 85 series

Casio FX 83 series

Examiner:

Professor Zhili Sun, Mr Chi Nguyen

Student ID Number

QUESTION 1

a) Place an "X" in the box next to the **3 most common statistical indicators** of financial risk.

[**6 Marks**]

☐	frequency	☐	index
☐	power	☐	variance
☐	trend	☐	logarithms
☐	mean	☐	standard error
☐	mode	☐	standard deviation

b) Monthly returns are provided for the following 2 equity stocks. **Calculate the statistical indicators selected in part (a) for each stock** and **explain which one is more risky**.

[**14 Marks**]

RedCo 4.0%, 0.4%, 9.5%, 0.5%, 7.0%, 3.7%, 12.4%, -3.7%, -4.8%, 3.5%, -5.4%, 0.8%
BlueCo 3.8%, 5.1%, 9.4%, -5.3%, 5.5%, -9.3%, 2.7%, -5.5%, -2.6%, -14.8%, -6.5%, 13.9%

QUESTION 2

a) Place an "X" in the box next to **3 terms** that are most directly related to the **historical method of calculating value at risk**. [**6 Marks**]

	cumulative frequency		average return
	cumulative value		absolute return
	coefficient of variation		internal return
	confidence score		risk premium
	confidence level		risk index

b) **Calculate the value at risk** for an equity stock using the following parameters and historical daily returns. **Indicate values for terms selected in part (a)**. [**14 Marks**]

Daily VaR for £1000 at 5%
3.8%, -2.6%, -5.1%, 6.6%, -3.2%, -0.1%, -0.4%, -2.4%, 13.8%, -1.3%,
-5.4%, -1.0%, -2.5%, -5.8%, 5.9%, 0.9%, 7.1%, -10.6%, -3.8%, 11.8%

QUESTION 3

a) Place an "X" in the box next to **3 terms** that are most directly related to **mean-variance theory of portfolio analysis**. [**6 Marks**]

	regression coefficient		risk adjusted frontier
	correlation coefficient		risk free frontier
	quadratic coefficient		covariance
	arithmetic average		kurtosis
	weighted average		skew

b) **Calculate the expected return and risk** of the portfolio containing the following 2 equity stocks. **Indicate values for terms selected in part (a)**. [**14 Marks**]

$x_1 = 0.4$ $\mu_1 = -0.069066342$ $\sigma_1 = 0.13075377$ $\rho_{1,2} = -0.041841417$

$x_2 = 0.6$ $\mu_2 = -0.013619198$ $\sigma_2 = 0.094981137$ $\rho_{1,2} = -0.041841417$

QUESTION 4

a) Place an "X" in the box next to **3 terms** that are most directly related to the **beta value** in the **single factor Capital Asset Pricing Model**. [**6 Marks**]

☐	determinant	☐	intercept
☐	derivative	☐	constant
☐	integral	☐	slope
☐	inverse	☐	index
☐	rank	☐	base

b) **Calculate the beta** for the following equity stock and **indicate the values for all terms selected in part (a)**. [**14 Marks**]

GreenCo 16.18%, 0.00%, -15.42%, -5.29%, 18.63%, 5.76%, 5.94%, 0.23%, 12.35%, -17.01%, -5.00%, -4.21%

S&P 500 6.13%, 0.59%, -4.26%, 5.84%, 5.86%, 4.35%, 7.81%, -5.75%, 5.32%, -3.45%, 4.46%, 1.57%

QUESTION 5

a) Place an "X" in the box next to **3 terms** that are most directly related to **financial risk measurements**. [**6 Marks**]

	volatility over time		cumulative value
	volatility relative to benchmark		expected value
	volatility relative to prime rate		standard value
	diversified volatility		critical value
	market volatility		z value

b) **Provide sample values of each term selected in part (a) for 3 hypothetical equity stocks**. **Compare and explain which stock has the most financial risk**. [**14 Marks**]