EXAMINATION

3 November 2014 (am)

Subject F105 — *Finance and Investment* Fellowship Principles

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Use the instructions and password provided at the examination center to log in.*

2. *Submit your answers in Word format only using the template provided.*

3. *Save your work regularly throughout the examination on the supplied computers' hard drive.*

4. *You have 15 minutes at the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made.*
   You then have three hours to complete the paper.

5. *You must not start typing your answers until instructed to do so by the supervisor.*

6. *Mark allocations are shown in brackets on exam papers.*

7. *Attempt all nine (9) questions, beginning your answer to each question on a new page.*

8. *Candidates should show calculations where this is appropriate.*

Note: The Actuarial Society of South Africa will not be held responsible for loss of data where candidates have not followed instructions as set out above.

AT THE END OF THE EXAMINATION

Save your answers on the hard drive AND hand in this question paper.

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved

QUESTION 1

Describe the role of a custodian, outlining its principal function and range of services.

[4]

QUESTION 2

There are three banks listed on a stock market. The salient details are shown in the tables below:

Share price cum-dividend

	Time 0	Time 1	Time 2
Bank A	100	110	120
Bank B	1000	800	100
Bank C	10	20	30

Number of shares

	Time 0	Time 1	Time 2
Bank A	100	100	100
Bank B	10	15	15
Bank C	1000	2000	2000

Dividends per share

	Time 0	Time 1	Time 2
Bank A	0	10	0
Bank B	0	0	0
Bank C	0	5	0

Assume that:

- Dividends are paid immediately at the time shown
- The share price after a dividend payment changes immediately by the dividend
- New shares are issued immediately after a dividend is paid
- New shares are issued at the ex-dividend share price

The base market capitalisation weighted banking index, I(0), equals 100.

Given that the starting index I(0) is 100, calculate I(1), I(2), TRI(1) and TRI(2), where I(t) refers to the market capitalisation weighted arithmetic index at time t and TRI(t) refers to the total return index at time t. I(1) must be calculated both cum- and ex- dividend.

[6]

PLEASE TURN OVER

QUESTION 3

You are the Chief Investment Officer of an asset manager looking to enter the retail equity investment market in which active management has been dominant. Your plan is to launch a range of passive equity unit trusts.

i. Outline the key elements that you would include in your marketing campaign to investors and financial advisers.

[4]

One of the practical obstacles you face is that roughly a quarter of the stocks of the local broad market index are thinly-traded, making full replication expensive.

ii. Discuss alternatives to full replication for the management of your passive portfolio, explaining how these approaches could make use of multifactor models and derivatives.

[5]
[Total 9]

QUESTION 4

The government of a developing country is contemplating revising the legislation that currently governs its financial markets to bring it in line with international standards. As the financial advisor to the listings authority, you have been tasked with finalising its rules to ensure that issuers of listed securities and connected parties continue to behave in a manner that does not conflict with other objectives of the listings authority.

i. Define statutory regulation and list its key advantages.

[2]

ii. Identify the types of penalties that may be imposed for any contravention or failure to comply with the listing requirements.

[2]

iii. Other than penalties as discussed in part (ii), discuss the aspects that the listings authority should prescribe in formulating its listing requirements.

[6]
[Total 10]

QUESTION 5

i. Briefly outline the three main classes of hedge funds, including the key investment characteristics of each.

[6]

PLEASE TURN OVER

A local hedge fund has just implemented the following strategy on the shares of company XYZ, which has a current share price of R50 per share:

- Purchased 1 million shares;
- Wrote 1 million European call options with strike price of R60 per share for R5 per option
- Purchased 1 million European put options with strike price of R50 per share for R5 per option

The options have the same maturity date of 3 months.

ii. Sketch the profit and loss diagram at expiry of the above strategy, showing clearly the axes intercepts.

[5]

iii. Suggest reasons why the investment manager implemented the above strategy.

[2]

[Total 13]

QUESTION 6

You advise the trustees of an educational trust on asset allocation strategy. The trust invests only in index-tracking funds for equities and bonds. The trust's long-term strategic asset allocation is 60% equities, 40% bonds, but the trustees are considering a more aggressive tactical asset allocation, with 80% in equities and 20% in bonds. The market expectations on which your projections are to be based are as follows (all figures are per annum effective):

Asset class	Expected return	Standard deviation
Equities	12%	20%
Bonds	7%	12%

The correlation coefficient between equity and bond returns is 0.5, and the risk-free rate of interest is 4% per annum effective.

i. Calculate whether the proposed tactical asset allocation results in an improved Sharpe ratio compared to the strategic allocation.

[5]

ii. Calculate the prospective tracking error of the tactical asset allocation portfolio.

[3]

iii. Discuss whether it is advisable for the trustees to proceed with the proposed tactical allocation, outlining any further information or analysis that might assist to make this decision.

[4]

[Total 12]

PLEASE TURN OVER

QUESTION 7

The liabilities of a large company include several credit-rated bonds. The bonds have just undergone an annual review of its credit ratings. The outcome of the review was a credit downgrade of all of its bonds.

i. Briefly outline key factors that may have led to the credit downgrade.

[4]

The assets of the company include a significant exposure to a R10 billion floating rate bond with remaining term of 11 years. The floating rate is paid half-yearly and is equal to the Johannesburg Inter Bank Agreed Rate (JIBAR). The Finance Director is concerned about the impact of falling rates on the company's assets. He would like to investigate ways of eliminating the company's exposure to floating rates for the last 10 years of the bond's life.

ii. Briefly explain how a swap, forward swap and European swaption can be used by the company to mitigate its exposure to floating rates, and explain the relative advantages and disadvantages of each.

[3]

The company's Finance Director decides to use a European swaption. The swaption price is based on the following information:

- The swaption gives the company the option to make payments linked to JIBAR in exchange for receiving 7% p.a. (convertible half-yearly) fixed over a 10-year period starting in 1 year;
- The current JIBAR yield curve is flat at 8% pa (convertible half-yearly);
- The volatility for the swap rate is 20%;
- Payments are semi-annual;
- The principal is R10bn.

iii. Calculate the price of the swaption using Black's model for valuation of European options.

[6]

[Total 13]

QUESTION 8

A fund manager measures the investment performance of his portfolio against a benchmark which consists of the median of the fund manager universe.

i. Explain the limitations of using the stated benchmark to measure the performance of the portfolio.

[5]

PLEASE TURN OVER

It is expected that a riskier investment strategy would produce higher average rates of return and therefore the measurement of relative performance should take account of the degree of risk taken on by the fund manager.

ii. Define ‘systematic risk’ and explain how the Capital Asset Pricing Model beta (β) can be utilised to measure this risk.

[3]

iii. Specify a risk-adjusted performance measure according to which the Capital Asset Pricing Model beta (β) is the appropriate measure of risk. Define all symbols used.

[1]

iv. Other than the issue of risk, discuss the limitations and disadvantages associated with the use of portfolio performance management techniques to support (future) decision making.

[5]
[Total 14]

QUESTION 9

i. Give two examples on how government policy on taxation can influence the commercial and economic environment for investors.

[2]

The government of a developing country operates a classical system of corporate taxation. The government is considering providing tax incentives to companies in targeted industries to help meet its economic objectives.

ii. State the two main corporation taxation incentives the government can provide.

[1]

The medium-term economic objective of the government of the developing country is to reduce unemployment. An advisor to the government has recommended tax incentives for companies in the consumer goods industry.

iii. Briefly discuss the specific risk of giving incentives to the consumer goods industry rather than to other sectors.

[4]

iv. Explain how the recommended tax incentives for consumer goods companies could aid the government in meeting its medium-term economic objective.

[6]

v. Discuss the potential concerns with the consumer goods industry targeted for tax incentives.

[6]
[Total 19]

END OF PAPER

