EXAMINATION

27 May 2019 (am)

Subject F105 — Finance and Investment Fellowship Principles

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Follow log in and saving instructions issued to you at the exam venue.*
2. *Save your work throughout the exam.*
3. *You are required to submit your answers in Word format only using the template provided. You MAY NOT use any other computer program (e.g. Excel) during the examination.*
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.*
7. *Attempt all eight (8) questions, beginning your answer to each question on a new page.*
8. *Show calculations where this is appropriate.*
9. *If answer booklets are used for any question(s) start each question IN A SEPARATE ANSWER BOOKLET, entering all candidate and examination details on EACH.*

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

**Check that you have saved your work as per instructions given to you.
Hand in your question paper with any answer booklets firmly attached.**

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 list.

QUESTION 1

A large multinational corporate that is listed on both a local and a European exchange has been the subject of high level accounting fraud. The company has made a number of acquisitions funded by issuing debt over the last number of years. When compiling financial statements for these periods, the value of assets were overstated while the liabilities such as debt and loans were allocated to off-balance sheet structures, thus overstating the company's financial position and profitability.

This fraud has now been uncovered and investigations are underway to determine the extent of the mis-statements. The outlook for the company appears highly uncertain and the share price of the company has fallen to close to zero.

i. Describe the fraud in terms of the agency problem and what this suggests about the company's corporate governance structures.

[3]

ii. Outline the roles and responsibilities of the main bodies responsible for preventing such fraudulent activity and explain how they may have potentially failed in their duties.

[7]

An asset manager argues that the market has overreacted and that this is a "buy" opportunity.

iii. Discuss the merits of this argument.

[3]
[Total 13]

QUESTION 2

A government-owned transportation company would like to raise capital in order to fund an extension to their current railway network. The company generates fairly consistent fee income from commuters using their railway services. An investment bank has proposed that the company set up a Special Purpose Vehicle (SPV) to securitise this fee income as a means of raising capital in order to build the new railway lines.

Recent riots by disgruntled community members have led to some trains being damaged and burnt. The company is concerned that negative publicity on the matter could lead to high levels of interest payable on the securitized debt, and that there could be inadequate interest from investors to take up the full issuance.

i. Describe the role of the SPV in the securitisation.

[4]

ii. Explain how the securitisation can be structured to address the concerns raised by the company.

[7]

iii. Outline the key advantages and disadvantages of obtaining credit ratings for the securities issued.

[2]
[Total 13]

PLEASE TURN OVER

QUESTION 3

A small IT company is looking to raise capital through either a private debt or private equity issue. The company would like to use the proceeds from the issue to fund the further development of predictive modelling software that can be used by retail businesses.

The company's revenue is still low but it is expected to grow gradually over the next five years.

i. Discuss the relative merits of the company issuing private debt over private equity.

[4]

ii. The company decides on a debt issuance. Describe the role an investment bank can play in ensuring the debt is successfully issued.

[3]

The company wants to construct a stochastic profit-projection model to aid it in determining how to best structure the debt issuance. In order to realise a profit for shareholders, the cost of financing the debt should not be more than 50% of the operating profits (before interest).

iii. State a well-defined objective for the stochastic model.

[1]

iv. List the main assumptions to be included in the model.

[3]

Assume the company issues a 5-year zero-coupon corporate bond, at a discount to its nominal value of R40m. The value of the company's assets immediately after the debt issue is R95m.

v. Calculate the value of the bond using the Merton model, assuming a risk-free force of interest of 7% p.a. and that the volatility of the company's assets is 35% p.a.

[5]

vi. Briefly comment on the attractiveness of this bond if immediately after issue the bond trades for R25m.

[1]

[Total 17]

QUESTION 4

A life insurer has a large book of inflation-linked annuity policies. The assets that have been invested in for these policies are government nominal bonds of various terms and short dated corporate nominal bonds.

Explain how the life insurer could use swaps to manage the risk exposure on this book of business, discussing the relative merits of the approaches.

[Total 8]

PLEASE TURN OVER

QUESTION 5

Happy Credit (HC) extends 3-, 4- and 5-year personal loans with the variable interest rate being linked to the prime rate, and capital being repaid over the loan term. HC funds its operations by issuing 3-year Floating Rate Notes (FRNs) at par, paying the 3-month Johannesburg Interbank Average Rate (JIBAR) plus 1% p.a.

i. Briefly describe four financial risks that HC is exposed to and provide one mitigation measure per risk that they can apply.

[6]

At present the annual, continuously compounding JIBAR 3-month rate is 9% and the 6-month rate, 10%.

ii. Calculate the value of a FRN that was issued by HC, with six months outstanding, on a principle of R10 million.

[3]
[Total 9]

QUESTION 6

i. Describe briefly the South African All-Bond index.

[2]

The following information is provided for a bond index (where the capital index is calculated using dirty prices):

	Capital Index	XD Adjustment	Accrued Interest
1 July 2017	459.56	55.12	1.56
31 Dec 2017	465.96	111.17	1.65
30 June 2018	474.78	57.17	1.74

The Total Return Index (TRI) is calculated net of 20% capital gains tax (based on clean price increases) and 25% income tax.

ii. Assuming a TRI of 1,000 on 1 July 2017, calculate the TRI on 30 June 2018.

[5]

iii. Apart from taxation and monetary policy, outline four other main forms of government policy that could affect bond returns, giving an example of how each one could do so.

[6]
[Total 13]

PLEASE TURN OVER

QUESTION 7

i. Outline 4 common classes of hedge funds.

[4]

A hedge fund that utilises derivatives alongside other assets is preparing its financial results for its investors.

ii. Outline the information relating to its holdings that should be disclosed for investors to fully understand the fund's exposures.

[6]

The hedge fund publishes the following table of statistics of its performance over the last 5 years compared to that of a representative hedge fund index:

	Fund	Index
Average return	11% p.a.	15% p.a.
Standard deviation	10% p.a.	8% p.a.

The return on the 3-month risk free instrument was 9% p.a. over the last 5 years.

iii. Calculate the Sharpe ratio for the fund and for the index.

[1]

A financial journalist writing about the hedge fund's performance and manager skill bases his article on a comparison of the Sharpe ratios for the fund and the index.

iv. Comment on the potential limitations of this comparison.

[5]
[Total 16]

PLEASE TURN OVER

QUESTION 8

An investment manager wants to develop a factor-based investment strategy. A factor-based strategy assumes that the returns generated on a stock in excess of the risk-free return can be explained by the stock's level of exposure to specific factors, or combination of factors. The manager will select thirty stocks based on the stocks' exposure to three factors. The same three factors will be used consistently. An equal proportion of funds will be allocated to each of the thirty stocks selected. The stocks selected will be revised and the portfolio rebalanced every quarter.

The local exchange maintains an index that includes 80 of the 100 stocks trading on the exchange. It is constructed on a market capitalisation-weighted arithmetic average basis, with constituents revised once a year.

i. Compare the factor-based strategy to a passive investment strategy that tracks the index.

[6]

The exchange wants to develop a Growth stock index and a Value stock index by categorising the largest 50 companies listed on the exchange as being either value or growth.

ii. Describe how the exchange would identify the stocks for inclusion in each index.

[5]

[Total 11]

[Grand Total 100]

END OF PAPER

