EXAMINATION

4 November 2015 (am)

Subject F105

Finance and Investment Principles

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

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

2. *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.*

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 list.

QUESTION 1

The government of a small developing country intends to introduce statutory regulation of its underdeveloped financial markets where, to date, participants who operate in these markets have been following a voluntary code of conduct.

i. Outline the reasons for the government wishing to introduce statutory regulation of the country's financial markets.
[5]

ii. Outline the advantages and disadvantages of statutory regulation for the government.
[4]

iii. Explain how statutory regulation may give rise to direct costs and suggest ways in which these can be financed.
[4]

[Total 13]

QUESTION 2

An Industrials company and a Utilities company of equal sizes have entered into a conglomerate merger.

Outline the movement of the price/earnings ratios (PERs) of the conglomerate during each phase of the trade cycle, as compared to the movements that would have been expected for the individual companies before the merger.

[Total 5]

QUESTION 3

Many active asset managers in a well-developed equity market have adopted either a value or a growth style. The local stock exchange is planning to develop appropriate benchmark indices for both styles of investment.

List three value and three growth factors that could be used in the construction of value and growth indices respectively.

[Total 3]

QUESTION 4

A global asset manager facilitates long-term investment in unlisted equity through infrastructure projects in developing countries and has recently launched a South American infrastructure fund that currently has two investments. The first is the largest wind farm in South America which is based in a mid-sized developing South American economy, much of whose geography runs along a geological fault line. The second is a toll road, part of the major north / south link, located in a different mid-sized country some 1000km away but running near the same fault line.

i. List the characteristics that distinguish infrastructure assets from more traditional investments.

[2]

ii. Outline the challenges faced by the infrastructure fund in attracting investors.

[5]

iii. For each of the wind farm and the toll road investment, briefly outline two primary risks related to investing in each of these infrastructure assets respectively, and show how these risks might be diversified by combining the investment in both in a single portfolio.

[5]
[Total 12]

QUESTION 5

A locally-listed media company acquired a small unlisted internet gaming and messaging venture company (OneCent) in a fast-developing country ten years ago which has seen a substantial increase in users and revenues, although it has yet to show a profit or pay a dividend. As a result of this growth, and the need for financing the future development of new internet services, the media company has decided to list OneCent in that country.

i. Suggest two possible valuation methods that might, in practice, be used by an asset manager to decide whether or not to participate in the initial public offering (IPO) of OneCent.

[2]

Following a very successful IPO, the local media company's share price increased substantially, making it by far the largest constituent of the local All-Share Index, a free float market-capitalisation arithmetic weighted index. Local asset managers have suggested that the All-Share Index needs to be revised to avoid such large concentrations.

ii. Outline a modification that could be made to the All-Share Index, noting limitations of this approach.

[3]

The local stock exchange publishes capital index values and dividend yields to enable investors to calculate total return index (TRI) values suitable for their own circumstances.

Date	Capital Value Index	Dividend yield (p.a.)
31 December 2014	1557	2.9%
31 March 2015	1678	2.6%
30 June 2015	1456	2.5%
30 September 2015	1268	2.4%

iii. Stating your assumptions, calculate the TRI values as at 31 March, 30 June and 30 September 2015. Assume a 15% dividend tax rate and a TRI value of 100 on 1 January 2015.

[4]
[Total 9]

QUESTION 6

You are the Chief Risk Officer of a large life assurer, and are reviewing the risk exposure of the investment strategy for the assurer's assets. The Chief Executive has asked you to perform a risk budgeting exercise for this purpose.

Outline the key objectives of risk budgeting and the process that would be followed, highlighting particular considerations that are important for the life assurer.

[Total 12]

QUESTION 7

You are the Chief Actuary of a large general insurer, whose strategic asset allocation has recently changed in line with a change in the underlying liability profile. The most important feature of the change required to move in line with the new strategic asset allocation is a shift of 15% of your total assets from bonds into equities.

i. Outline the costs and key risks relating to the transactions required to effect this change in asset allocation in the spot (underlying) market.

[4]

ii. Outline a transition management process which could address the transaction concerns raised in (i) above.

[6]
[Total 10]

QUESTION 8

A balanced fund manager that constructs portfolios using a top-down approach was awarded an initial one-year mandate starting on 1 January 2014, with the intention to renew this based on satisfactory performance. The manager opted for a 60% equity and 40% long-bond position at the start of the mandate. The benchmark was 80% equity and 20% bond (all stocks) on 1 January 2014. No rebalancing occurs during the year. The actual time-weighted rates of return per quarter for 2014 are shown in the table below:

Fund returns:	**Q1**	**Q2**	**Q3**	**Q4**
Equity	7%	2%	2%	1%
Fixed-interest	4%	2%	1%	0%
Benchmark returns:	**Q1**	**Q2**	**Q3**	**Q4**
Equity	5%	-6%	-4%	1%
Fixed-interest (all stocks)	4%	1%	4%	1%
Fixed-interest (15+ years)	6%	3%	5%	3%

i. Explain what is meant by a top-down approach to constructing a portfolio.

[1]

ii. Calculate the fund and benchmark returns for 2014, and show the split of over/under-performance between the following components:

- Asset-allocation decision
- Bond duration decision
- Stock selection decision

[5]

iii. Discuss the performance of the manager based on the results calculated in part (ii).

[6]

iv. Outline the potential limitations of the above performance attribution analysis, and possible actions to address these.

[4]

[Total 16]

QUESTION 9

A life assurer is entering a frontier market, i.e. one which is less established than an emerging market, selling only deferred annuity products in the domestic market. The features of the product are as follows:

- Regular level premiums are payable until a pre-selected annuity conversion date, and these are invested in a domestic money market account during this period; and
- After the annuity conversion date, a level nominal income is paid to the policyholder until death.

The assurer is considering offering an additional benefit where it guarantees the annuity conversion rate at the annuity conversion date.

i. Ignoring expenses and mortality, sketch a cash-flow profile of the expected premiums, investment income and annuity payments over the term of an individual deferred annuity contract.

[3]

The life assurer wants to minimise the strategic risk through Liability Driven Investment (LDI) for the deferred annuity product cash-flows. The only investment instruments available for consideration are domestic money market and domestic government conventional bonds.

ii. State the definition of LDI.

[2]

iii. Ignoring expenses and mortality, describe the LDI approach to determine the optimal combination of available assets for the deferred annuity product, given the following scenarios:
   a. Excluding the annuity conversion rate guarantee; and
   b. Including the annuity conversion rate guarantee.

[10]

Domestic investment banks have created a domestic swap market.

iv. State the definition of a swap and explain how the swap market, without other derivatives, can mitigate some of the LDI implementation problems caused by a limited supply of domestic government conventional bonds.

[5]
[Total 20]

END OF PAPER