Actuarial Society of South Africa

EXAMINATION

18 May 2017

Subject F205 - Investment

Fellowship Applications

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Candidates will be issued with instructions to log-in using a password (which you will be provided with at the exam center).*

2. *Candidates are required to submit their 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 continuously throughout the exam, on your computer's hard drive that you have been provided.*

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 invigilator/supervisor.*

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

7. *Attempt all 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.
Hand in your question paper with any additional sheets 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

You are an advisor to a medium-sized South African life insurance company that writes predominantly annuity business. The insurance company is currently reviewing its investment strategy and approaches you for advice regarding its property portfolio.

i. Describe the main types of property investments available to such an insurance company and briefly discuss the relative merits of each.

[12]

The insurance company has, to date, limited its property portfolio to investment in listed South African property company shares.

ii. Discuss the relative performance of the SA listed property index (SAPY) over the last 10 years.

[6]

The chair of the insurance company's investment committee has noted that, even though the listed property shares have typically performed very well, they have not been included in any of the underlying managed local equity portfolios.

iii. Suggest reasons why this might be the case.

[3]

The insurance company has been offered the opportunity to invest in a new property development - a residential retirement village. The retirement village is to be structured such that individuals over the age of 55 purchase units in the village on a "life rights" basis. Under this arrangement, the buyers or their surviving spouses are entitled to occupy the property until the last of them dies. After the second death the original purchase price of the unit is refunded to the deceased's estate and ownership of the unit reverts to the retirement village. The unit is then resold by the retirement village to the next occupant.

iv. Discuss the merits of such an investment and assess the viability for the life company, given that a large portion of their book of business is a pool of guaranteed and with-profit annuities.

[12]

[Total 33]

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PLEASE TURN OVER

QUESTION 2

You are an independent consultant to a large South African defined contribution pension fund. One of the fund's trustees has approached you for your opinion on whether the fund should invest in insurance-linked securities (ILS) such as catastrophe bonds (the most common type of ILS).

Catastrophe bonds ("cat bonds" for short) are a way for insurers/reinsurers to pass on risk to capital markets. The proceeds from the sales of cat bonds to investors are usually invested in near risk-free assets to generate money market returns which, when combined with a premium paid by the insurer, can allow the bond holder to receive a substantial spread over money market returns as a quarterly coupon. If no pre-defined insurance events (i.e catastrophes) occur, the investor enjoys the enhanced coupon for the term of the bond, typically 3 years, and receives the principal back at maturity. If one of the designated events occurs, all or part of the principal is transferred to the insurance company, the investor's coupon payments cease or are reduced, and at maturity there is either zero, or a reduced amount of principal repaid to the investor.

As an example, a cat bond might be structured to trigger a reduction in the principal of the bond if the sponsoring insurer's residential property losses from a single hurricane in the U.S. state of Georgia exceed $25 million, in the period from April 1, 2016 to March 31, 2018.

The trustee has shown you the following table of returns over the 10 year period to the end of December 2016.

Asset class	**Total return (CAGR)**	**Monthly standard deviation**
Global cat bond index (US$)	8.3%	0.98%
S&P500 (US$)	6.9%	4.2%
Global bonds (US$)	4.0%	1.0%
JSE ALSI (rand)	10.3%	4.3%
ALBI (rand)	7.9%	2.2%

The rand/US$ exchange rate at 31 December 2016 was R13.63 and R6.97 on 31 December 2006.

The trustee notes that, over the period, the cat bond index's return, is the second highest.

i. Discuss the returns generated by the cat bond index in the context of the returns generated by the other asset classes over this period. [5]

ii. Discuss the suitability of cat bonds for the pension fund in question, highlighting the considerations the trustees would need to devote attention to. [15]

After discussing the suitability of cat bonds for the pension fund, the trustees have decided to appoint a specialist external cat bond fund manager.

iii. Discuss the factors the trustees should consider in selecting a suitable cat bond manager. [15]

[Total 35]

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QUESTION 3

You are an investment advisor to a large South African defined contribution pension fund. The membership comprises mostly low to medium income earners, with a few members at management/executive level.

A proposed new retirement fund regulation stipulates that preservation of benefits when leaving a fund will become compulsory for all members. Under the proposed regulation, members would be able to access a portion of their preserved benefits once before retirement age under certain circumstances. In addition, funds would have to make available an Independent Financial Advisor with whom members leaving the fund can consult.

The chair of the board of trustees wishes to understand how the proposed regulation might affect the fund's members.

i. Describe the possible advantages as well as disadvantages of the new proposed regulation.

[5]

The chair feels that the members' interests will best be served if the fund's administration is kept in-house whilst appointing an external asset manager to manage the Preservation Fund assets. The board has therefore agreed to launch an in-fund preservation fund option.

ii. Describe how the liability of a preservation fund differs from that of a normal pension fund and the main factors you would consider when launching an in-house preservation fund.

[5]

The trustees have decided to include hedge funds in their investment strategy for both the Pension and the Preservation funds and are investigating a new product which has been described to them as a Hedge Fund ETF. The ETF aims to recreate the risk and return characteristics of a newly launched hedge fund index - the HFID. The HFID is based on an equally weighted selection of 50 well-established hedge funds that follow a range of different strategies.

iii. a. Briefly describe three different methods that would typically be used by an ETF provider to replicate performance of an index and discuss, giving reasons, how appropriate each method would be for replicating the HFID.

b. Explain how, in this case, replication could be achieved using a factor-based quantitative model? [7]

iv. Discuss the factors to be considered by trustees before including a product of this nature in the Pension and Preservation fund by considering both fund related issues and issues specific to the product.

[15]

[Total 32]

[Grand Total 100]

REMEMBER TO SAVE

END OF EXAMINATION

