

Actuarial Society of South Africa

EXAMINATION

3 May 2019

Subject A311 — Actuarial Risk Management

Paper Two

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 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. You 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 to the hard drive.

Hand in your question paper with any additional sheets firmly attached.

<p><i>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.</i></p>
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QUESTION 1

It is necessary to monitor and review the continued appropriateness of any investment strategy at regular intervals

- i. Describe the main reasons why monitoring of any investment strategy is important. [1½]
 - ii. Describe how the monitoring process for the investment strategy relates to the Actuarial Control Cycle (ACC) and how it will feed back into the ACC. [3½]
- [Total 5]

QUESTION 2

- i. In some territories there are statutory roles that can only be taken by actuaries. List the typical aspects that are usually required to be certified by actuaries. [3]
 - ii. Sometimes a conflict of interest that an actuary may experience is between the interests of the client and the client's customers. Provide one example of such a conflict. Furthermore, describe how the actuary should manage these types of conflict. [3]
- [Total 6]

QUESTION 3

A 21-year old rugby player has just been selected for the national rugby team. He therefore plans to play rugby on a fulltime basis - at least for as long as he can.

He realises that a rugby career won't persist until his retirement, and he therefore expects to play rugby for a period of about 7 years. Thereafter he plans to become a professional coach for local schools and provincial teams.

The rugby player is not yet married, but he intends to get married and start a family in the next 3 to 5 years.

Discuss the main financial needs that the rugby player is likely to have during his rugby career, and comment on the financial products available for these needs. Where relevant, also comment on which cover might be difficult to obtain and the reasons why. Only focus on life insurance and benefit-type needs and products.

[Total 7]

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QUESTION 4

It is often said that discontinuance terms on a life insurance contract should be set in a way that is fair to the main stakeholders involved.

- i. State three (3) main stakeholders to consider in setting surrender value terms for a with-profit endowment assurance contract. For each stakeholder give an example of how terms may be unfair.

[3]

- ii. List six (6) other considerations to consider when setting discontinuance terms on a life insurance product.

[3]

[Total 6]

QUESTION 5

The country you live in recently voted to stop doing any business with the rest of the world. A date has been set of 1 June 2019 when this will occur. You work at the insurance regulator in the country. What are the main functions you have to perform and how do these relate to the 1 June exit date?

[Total 10]

QUESTION 6

The insurance company you work for has decided that they want to cut down on buying reinsurance in the future.

- i. What is reinsurance? [1]

- ii. Why might they have taken that decision? [2]

- iii. What are the possible downsides for the company to either reduce using reinsurance or to stop using it altogether? [4]

Your boss suggests that in future the company only buys Catastrophe Excess of Loss reinsurance.

- iv. Explain what Catastrophe XL reinsurance is and what its main aim is. [4]

[Total 11]

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QUESTION 7

You are the product development actuary at a life insurer. The board has asked you to develop an immediate annuity product as the company doesn't currently sell annuities at all.

- i. Briefly explain what an immediate annuity is. [2]
- ii. Describe the cash flows for an immediate annuity for the investor and the life insurer. [3]
- iii. List who you would involve from your company in the design of the new product and state why you would involve them. [5]

[Total 10]

QUESTION 8

You work for a South African insurer that only sells life insurance with premiums that are age-related. Their investment strategy is to invest in fixed interest government (South African) bonds only.

- i. Discuss the appropriateness of this strategy. [8]
- ii. Describe the insurer's cashflows for a fixed interest bond. [2]

[Total 10]

QUESTION 9

Grey Life is a life insurer focusing on providing annuities and other life insurance products to the retired population.

Define the following risks for Grey Life and provide the required number of practical examples of how they might materialise:

- i. Liquidity risk. Give one example. [2]
- ii. Market risk. Give two examples. [2]
- iii. Business risk. Give five examples. [3]

State two examples of what impact the following risks might have on Grey Life and how it can be evaluated:

- iv. The risk to Grey Life of their CEO making a bad decision. [3]
- v. A major movement in the interest rate. [3]

[Total 13]

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QUESTION 10

A farmer in South Africa is heavily affected by the energy crisis which effectively means the farm often does not have a continuous electricity supply. He is contemplating installing alternative energy-producing mechanisms on the farm, and the three options include solar energy, wind turbines and diesel generators.

He is not sure how to decide on the best approach, and he has asked for your consulting company's advice on the way forward.

- i. Provide an outline of the detailed project appraisal process that you will follow to make an informed decision.

[5]

The farmer's neighbour has suggested to him that he should only focus on the approach that provides the highest internal rate of return (IRR) for his business.

- ii. Define the IRR.

[1]

- iii. Outline the information or assumptions that will be needed in order to calculate the IRR for each approach.

[6]

- iv. Discuss the suitability of the neighbour's suggested approach and suggest other potential methods.

[10]

[Total 22]

[GRAND TOTAL 100]

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END OF EXAMINATION