

Actuarial Society of South Africa

EXAMINATION

7 May 2021

Subject A311 — Actuarial Risk Management

Paper Two

Time allowed: Three hours and fifteen minutes, plus an additional five minutes to allow for scrolling in the ASSA Exam Platform

Total marks: 100

INSTRUCTIONS TO THE CANDIDATE

1. *Ensure that you are logged in and authenticated through Examity before you attempt the examination.*
2. *Questions are only available in the ASSA Exam Platform and may not be printed.*
3. *Submit all of your answers in the ASSA Exam Platform only. No uploads of answers (handwritten or otherwise) to the ASSA Exam Platform will be accepted.*
4. *You may not use any other computer program (e.g. Email, MS Word or Excel) or files, nor open any other browser during the examination.*
5. *You may not make use of a Formulae and Tables book during the examination. Any such information that may be required will be provided to you within the examination.*
6. *You are strongly encouraged to use the first 15 minutes as reading time only, however, you may commence answering the paper whenever you are ready.*
7. *Mark allocations are shown in brackets.*
8. *Attempt all questions.*
9. *Show calculations where this is appropriate. You may use blank paper to carry out rough work calculations. You may use a calculator from the approved list only.*
10. *You may return to your answers to review and amend during the allotted examination time. Once you are happy with your answers you need to **Finish all and Submit** your work. Once you have submitted you will not be able to make any more changes to your answers.*
11. *You must submit all work BEFORE the end of the allotted examination time. Take this into account when planning your review and submission. There will be no time announcements.*

Note: Answers will be saved automatically during the examination if you are connected to the ASSA Exam Platform. However, 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.

END OF INSTRUCTIONS

QUESTION 1

- i. Outline the main benefits associated with the regulation of financial services. [6]
 - ii. Describe the direct and indirect costs that are associated with this regulation. [5]
- [Total 11]

QUESTION 2

Pharmarama is a pharmaceutical company which develops a range of drugs. The company is due to announce the results of a much anticipated and important drug trial which, if successful, will bring significant financial rewards to the company. The share price has already increased slightly in anticipation of the results. You believe that the chance of a successful outcome is 50%.

A colleague, who works for a hedge fund management company, has suggested simultaneously purchasing at-the-money call and put options on Pharmarama shares with the same strike price and expiration dates.

Describe the expected payoff profile from this strategy and explain why it is an appropriate strategy in this situation.

[Total 6]

QUESTION 3

You work for Kappa Re, a reinsurance company specialising in providing non-life (general) reinsurance solutions to the market. Kappa Re has been approached by an insurance company (INSCo) that wants assistance in structuring and obtaining risk excess of loss (“Risk XL”) cover for their portfolio of commercial properties that they insure.

- i. Describe how Risk XL reinsurance works. [3]
- ii. List reasons why Kappa Re may want to use Risk XL reinsurance. [2]

INSCo were very generous in providing Kappa Re with data on all the properties they have insured over the past three years as well as all the claims on this portfolio over the same period. The actuaries at Kappa Re spent some time analysing the data and came up with a simple, but accurate, model that gives distributions of claims frequency and severity for each of the risks covered in the historic experience.

- iii. Explain how you might use this model and data to assist with structuring and pricing the Risk XL reinsurance for INSCo. [7]

[Total 12]

REMEMBER TO SAVE

PLEASE TURN OVER

QUESTION 4

A country has a long-established State pension system. The main element of the system is a flat-rate pension payable in full, from age 60, to all citizens who have contributed to the State Social Security arrangements for at least 20 years of their working lifetime.

The current amount of the full pension is R100,000 p.a., and the pension has historically been increased in line with the increase in the national average earnings index for the country. The country also has a well-developed occupational pensions sector.

The State pension is funded on a pay-as-you-go basis. The Government is concerned that the State pension is becoming increasingly difficult to finance and is unsustainable in the long term in its current form.

- i. Define the expression “funded on a pay-as-you-go basis”. [1]
 - ii. Explain how recent demographic trends may have led to the Government’s concerns on financing the costs of the State pension. [3]
 - iii. Describe ways in which the total level of State pension outgo can be reduced and comment on other issues that the Government should consider. [5]
- [Total 9]

QUESTION 5

- i. Define active versus passive investing in the context of a portfolio of local equities. [2]
- ii. List the two (2) main advantages and disadvantages of both active and passive investing. [4]
- iii. Outline reasons why a passive portfolio would not provide returns which are perfectly in line with the benchmark it is tracking. [3]

Mr Moneybags has invested funds quarterly in two unit trust portfolios over a one year period: Portfolio A and Portfolio B. Both portfolios have the same benchmark. You are provided with the following fund performance information over the one-year period:

	Time-weighted rate of return	Historic tracking error
Portfolio A	10%	8.0%
Portfolio B	5%	1.1%

The benchmark return was 6% over the one-year period.

REMEMBER TO SAVE

PLEASE TURN OVER

iv. Comment on and suggest possible reasons for the differences in performance between Portfolio A and Portfolio B. [3]

v. Explain why the time-weighted rate of return might be preferred over the money-weighted rate of return to evaluate the performance of a portfolio manager. [3]

[Total 15]

QUESTION 6

i. Describe the role of the regulator in protecting policyholders from insurance company insolvency. [4]

The regulator has intervened in the affairs of a life insurance company to require it to close to new business after it failed to be able to meet the required level of solvency capital.

ii. Set out the short-term and longer-term effects of closing to new business on the insurance company's:

- a. expenses [5]
- b. withdrawal rates [3]
- c. investment policy [5]
- d. with-profit bonus strategy [2]

[Total 19]

QUESTION 7

BetaLife is a large life insurance company specialising in providing employee group insurance products to companies of various sizes and from a variety of industries. BetaLife's products are annually renewable and cover a wide variety of risk contracts. Many employers take out a number of contracts at the same time to provide comprehensive cover for their employees.

i. List three (3) types of group risk contracts that might be taken out by an employer to cover their employees and explain the benefits provided and how each might work in practice. [6]

ii. Explain what is meant by anti-selection and give two (2) examples from life insurance. [2]

iii. Briefly discuss why we would expect a lower risk of anti-selection on group business. [3]

REMEMBER TO SAVE

PLEASE TURN OVER

It has come to light that the total claims experience was significantly heavier in the most recent year, compared to previous years. Management has tasked you with performing an actual versus expected claims analyses and then investigating the reasons for the poor claims experience.

iv. Outline what data and information you would require to perform this analysis. [8]

v. Describe how you would analyse the actual and expected claims experience. [5]

vi. Outline some of the issues you would investigate as possible reasons for the poor claims experience. [4]

[Total 28]

[GRAND TOTAL 100]

REMEMBER TO SAVE

END OF EXAMINATION