

Actuarial Society of South Africa

EXAMINATION

12 October 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 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 use 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 start answering the paper whenever you are ready.
7. Mark allocations are shown in brackets.
8. Attempt all questions.
9. Show calculations where 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 satisfied 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. Consider this when planning your review and submission. There will be no time announcements.
12. An option to opt out of the examination will become available one hour after the official examination start time. If you select the Opt-Out option, you agree and understand that your entire script/answers will be deleted and cannot be retrieved at a later stage and that your script or part thereof will not be put forward for marking.

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. Define operational risk. [2]
 - ii. Outline the practical options that a company can consider to manage their risk associated with cyber-attacks on its computer systems. [4]
- [Total 6]

QUESTION 2

- i. Explain the cashflows of an index-linked bond from the perspective of the bond buyer. [2]
 - ii. Briefly outline the theories which explain the shape of real yield curves. [3]
 - iii. Discuss reasons why a real yield curve may be downward sloping. [2]
- [Total 7]

QUESTION 3

CoverU is an established general insurer writing various lines of insurance. Their policies are written either with premium being payable monthly or annually in advance.

- i. Explain the three (3) most likely reserves that CoverU would need to calculate on a regular basis and give a practical example of how each reserve might arise. [6]
 - ii. For each reserve in (i), describe a different method or approach to calculating the reserve. [3]
- [Total 9]

QUESTION 4

- i. Outline the assumptions that will be financially significant in setting the premium rates for employers' liability insurance. [4]
 - ii. Describe how the values of these assumptions would be determined. [12]
- [Total 16]

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QUESTION 5

- i. Define the term “new business strain”. [1]
 - ii. List two types of life insurance policy that normally experience a limited amount of new business strain (or none at all) and briefly explain why. [2]
 - iii. Explain how new business strain is recouped. [2]
 - iv. Discuss other reasons why an insurer may need to hold capital. [7]
- [Total 12]

QUESTION 6

A South African defined contribution pension fund has just completed an asset liability modelling exercise which suggests that the fund should invest a portion of its assets in domestic property. The trustees have decided to follow this advice and are considering how to obtain exposure to property. They have indicated a preference for commercial type properties such as shopping centres.

They are considering using Real Estate Investment Trusts (REITs), which are companies that manage, operate and own a real estate portfolio of income-producing property and are listed on the stock exchange.

List the advantages and disadvantages of using REITs compared with direct investment for the pension fund.

[Total 10]

QUESTION 7

LifeCo is a life insurance company specialising in providing whole life insurance products to the middle- and high-income end of the market.

- i. Outline reasons why LifeCo’s products are underwritten. [4]
- ii. Briefly discuss the likely underwriting approach followed by LifeCo. [7]

Recently, it has been announced that LifeCo will start using a less stringent and less onerous underwriting approach.

- iii. Suggest possible reasons why LifeCo made this decision. [4]
- [Total 15]

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QUESTION 8

Major Motors is a car manufacturer that specialises in producing small family cars. The company has existed for over 50 years. Major Motors is based in a developed country where it carries out all its manufacturing activities.

The company prides itself on treating its employees well and, since its start, has offered a generous defined benefit pension scheme, based on a $1/60$ accrual rate and final salary. The contribution rate to the scheme has increased significantly over the last 20 years.

- i. Outline possible reasons why the contribution rate for the defined benefit scheme has increased over time.

[5]

The directors are concerned about the sustainability of continuing to offer the scheme and wish to explore other options for all future service for existing and new members. Most other car manufacturers in the country offer a defined contribution benefit scheme. However, the scheme actuary has suggested that Major Motors considers offering a hybrid scheme, based on a defined contribution arrangement with a defined benefit underpin.

The contribution rate (as a percentage of salary) to the hybrid scheme would be 8% (5% from Major Motors and 3% from members). The underpin would operate as a type of guarantee such that, at retirement, the accumulated defined contribution account for the member would be compared with the present value of a single life pension, based on a $1/100$ accrual rate and final salary. If the underpin amount is more than the defined contribution account, then the defined contribution account would be increased to equal the present value of the defined benefit underpin, the cost of the increase being met by Major Motors.

- ii. Discuss the advantages and disadvantages to the company and members of offering a hybrid scheme rather than a defined contribution scheme.

[9]

- iii. Outline the financing methods that may be considered by Major Motors to meet the cost of the underpin, including the main issues arising for each.

[5]

The company is considering giving members an investment choice from a wide range of funds in the hybrid arrangement.

- iv. Discuss the disadvantages to the company of offering a choice of investment funds within the hybrid arrangement.

[6]

[Total 25]

[GRAND TOTAL 100]

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END OF EXAMINATION