

EXAMINATION

17 November 2021 (am)

Subject F103 — *General Insurance* Fellowship Principles

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 Examiity 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 eight (8) 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.
12. An option to opt out of the exam will become available 1 hour after the official exam 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. Outline the purpose and operation of a second surplus reinsurance treaty. [2]
- ii. Explain briefly whether you would expect a direct writer and its surplus reinsurer to have the same claims experience (proportionally) on a reinsured portfolio. [2]

M&M is a general insurer which has reinsurance treaties which operate in the order given below:

- 25% Quota Share treaty with Reinsurer A.
- Surplus with Reinsurer B, which has the following conditions:
 - A maximum retention limit of \$50m.
 - A maximum of 4 lines of cover.
 - M&M must retain at least \$10m on each risk reinsured.
- Risk Excess of Loss with Reinsurer C, providing cover of \$4m in excess of \$2m.

You have been provided with the following extract of claim recoveries:

Policy	Sum Insured	Retention	Claim	Reinsurance Recoveries		
				Reins. A	Reins. B	Reins. C
1	\$100m	maximum permitted	\$12m	(a)	(b)	(c)
2	\$120m	minimum permitted	\$40m	amount not provided	(d)	(e)
3	amount not provided	not provided	(f)	amount not provided	\$9m	\$1m

- iii. Determine the amounts (a) – (f) in the above table.

[7]

[Total 11]

QUESTION 2

You are the capital management actuary for ISure, a large multi-line insurer. You have recently updated the capital model and intend to allocate the insurance risk capital requirement across the various lines of business ISure writes.

- i. Define “insurance risk”. [2]
- ii. Outline 4 methods that can be used to allocate the capital requirement, including one disadvantage for each method. [8]

[Total 10]

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QUESTION 3

A large composite insurance company currently offers a wide range of insurance covers. The company is looking to expand its current product range and is considering offering a comprehensive private motor insurance product that will only ask for the following information before providing a quote:

- Applicant's ID number;
- Car registration number;
- Excess level;
- Whether car hire in the event of the insured car being damaged is to be included; and
- Insurance coverage start date.

- i. Outline briefly the rating factors you can derive from the five underwriting questions. [4]
- ii. Outline the effect inadequate data has on pricing. [4]
- iii. Discuss briefly other sources of data that could be used to help improve the pricing of the product. [5]
- [Total 13]

QUESTION 4

A short-term insurer has been selling personal lines insurance products for the last 5 years. The insurer has recently experienced an increase in the loss ratio on the Motor business.

- i. Explain why premium rate is a key factor of the business to monitor, and provide an example of how this measurement can be used. [2]

You have been asked to investigate the reasons for the increase in the Motor loss ratio, and have been provided with the following data:

Year	Premium Rate	Loss Ratio
2020	5.0%	77%
2019	5.5%	70%
2018	6.0%	65%
2017	5.8%	55%
2016	6.0%	50%

- ii. Suggest, based on the information provided above, possible reasons for the deteriorating loss ratio.

[6]
[Total 8]

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QUESTION 5

The International Space Agency (ISA), a multi-national organisation, is planning to build a base on Mars. The project entails using space rockets to transport materials and employees of ISA from Earth to Mars to build this base.

ISA doesn't have much expertise in building rockets. Consequently, they will be purchasing rockets from Alon Tusk Enterprises, a privately-owned entity in the business of building rockets.

- i. Describe briefly 6 distinct risks faced by ISA as a result of this project and suggest, for each, an appropriate general insurance product. [9]
- ii. List a key insurance product, outlining the benefits it provides, that should be purchased by Alon Tusk Enterprises in relation to building space rockets for ISA. [2]

ISA has purchased insurance cover for the above risks from an insurer. However, the insurer is concerned about the possibility of accumulations of risk present in such a project.

- iii. Outline briefly 4 ways the insurer could mitigate this accumulation risk. [4]
- [Total 15]

QUESTION 6

- i. Define the following:
 - a. Claims made policy; and
 - b. Losses occurring policy. [2]
- ii. State the typical basis for cover used on the following liability types:
 - a. Professional indemnity liability;
 - b. Motor third party liability;
 - c. Environmental liability; and
 - d. Marine and Aviation liability. [2]

Gensure, a large general insurance company specialises in liability business. Gensure has previously written employers' liability business on a losses occurring basis but has decided to transition these policies to a claims made basis.

- iii. Outline the problems that this transition may cause for Gensure. [8]
- [Total 12]

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QUESTION 7

- i. Outline the cover provided by mortgage indemnity insurance, highlighting any unusual features of mortgage indemnity compared to other insurance classes.

[2]

Information about one of the mortgage indemnity policies sold by an insurer is summarised below:

Policy inception	Policy term	Single Premium	Acquisition costs
1 June 2019	25 years	R 21 000	R 2 000

- ii. Calculate the unearned premium reserve and deferred acquisition costs for this policy at 31 December 2019 and 31 December 2020, assuming that risk and acquisition costs are spread uniformly over the policy term.

[2]

- iii. Explain the appropriateness of the assumptions given in part (ii) above.

[2]

The insurer's investment strategy is to only hold money market instruments as investments for the mortgage indemnity cover.

- iv. Discuss the suitability of this investment strategy by referring to the liability characteristics.

[6]

One of the insurer's directors suggests that an asset-liability model should be used to review the investment strategy.

- v. Comment on this suggestion.

[3]

[Total 15]

QUESTION 8

You work for a general insurance company that offers Business Interruption (BI) cover as part of its commercial lines business.

Due to a global pandemic the government imposed "lockdown" restrictions from a specific date in March 2020 which forced most businesses to cease operating for a period of time. BI policy wording specifies that the insurer will cover losses resulting from a pandemic if the insured can show that on commencement of the "lockdown" there was at least one infected person within a 50 km radius of the insured premises.

It is now July 2020 and you are responsible for setting the BI claims reserve as at 30 June 2020. The underwriters have provided you with an extract of all commercial property policies with BI cover on commencement of the 'lockdown'. You have also gathered the following additional information:

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- BI policy conditions can be amended by the insurer providing 30 days' notice, and notice was given on the 1st of April that all BI cover would expire on 1st May 2020.
 - You have been provided with location information of all known infected people in the country at commencement of the 'lockdown'.
 - While it is expected that BI claims paid by the insurer should be recoverable from the catastrophe excess of loss (Cat XL) treaty, not all the reinsurers on the catastrophe programme have confirmed that they will honour these BI claims.
 - The Cat XL treaty has a seven day "hours clause". There is some uncertainty about the proportion of gross claims that will be aggregated to the selected seven day period due to differing reinsurer views regarding the validity of claims.
- i. Outline the factors that need to be taken into account in determining the benefit payable to a policyholder with BI cover, assuming a valid claim. [4]
 - ii. Explain briefly the difference between bottom-up and top-down exposure-based reserving methods used when statistical methods are not suitable. [4]
 - iii. Outline how a bottom-up exposure based method could be used to determine the BI claims' reserve net of reinsurance as at 30 June 2020. You can assume that you will be working with a loss adjustor who will determine the insurance benefit for each policy. [6]
 - iv. List 4 objectives that should be taken into account when communicating the uncertainty underlying the BI claims' reserves to the Board. [2]
- [Total 16]

END OF PAPER