EXAMINATION

17 November 2022 (am)

Subject F103 — *General Insurance* Fellowship Principles

Time allowed: *Three hours and twenty minutes (which includes five minutes for downloading and uploading your answer document)*

Total marks: *100*

INSTRUCTIONS TO THE CANDIDATE

1. *Ensure that you are logged in and authenticated through Examity before you attempt the examination.*
2. *The question paper is only available in the ASSA Exam Platform as a PDF download and may not be printed. Copy/paste of questions or parts thereof is allowed from the question paper to your Word answer document only.*
3. *Download the Word answer document template from the ASSA Exam Platform. Save this Word answer document on your desktop using your Candidate Number as filename. You are required to submit your answers in Word format ONLY using this document. No answers in any other format (e.g. handwritten) will be accepted. Save work regularly.*
4. *Ensure that your Candidate Number appears in the "header" of your Word answer document. [Double-click on the header at the top of the Word document, input your Candidate Number only in the header, then press "Esc" to close the header.]* ***Do not use your name or member number anywhere in your Word answer document.***
5. *You may not access any file from your computer, use any other computer program (e.g. Email or Excel), or open any other browser during the examination.*
6. *You may not use any other material (e.g. a Formulae and Tables book) during the examination. Any such information that may be required will be provided to you within the examination.*
7. *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.*
8. *Mark allocations are shown in brackets.*
9. *Attempt al eight (8) questions, starting each on a new page (as provided for in the Word answer document).*
10. *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.*
11. *Upload your Word answer document only into the ASSA Exam Platform. Once you have uploaded your document, you must click on* ***Finish Attempt*** *to save your document. You will still be allowed to go back and make changes (****Review Attempt****) if you have time.*
12. *Once you are satisfied with your uploaded document, click* ***Finish Attempt*** *and* ***Finish all and Submit****. Once you have submitted you will not be able to make any changes.*
13. ***You must submit your Word answer document BEFORE the end of the allotted examination time.*** *You should stop writing and start uploading during the last five minutes (when the ASSA Exam Platform countdown clock turns red). Take this into account when planning your review and submission. There will be no time announcements.*

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.

END OF INSTRUCTIONS

QUESTION 1

An established general insurer specialises in commercial property insurance. It has reinsurance treaties in place with a large reinsurer which operate in the order given below:

- 20% Quota Share; and
- Surplus, with a maximum retention limit of $4m.

The extent of the Surplus cover used for each risk is based on the insurers risk classification as follows:

- Category 1: Covering all risks with a Sum Insured not exceeding $5m. No Surplus reinsurance is used for such risks.
- Category 2: Covering all risks with a Sum Insured in excess of $5m. For these risks the insurer makes use of a linearly increasing number of lines of Surplus cover, starting from zero lines for a Sum Insured of $5m increasing to 7 lines at the maximum allowable Sum Insured according to its reinsurance arrangements.

i. Determine:

   a. The largest Sum Insured that the insurer is able to write according to the reinsurance treaties;
   b. The maximum single recovery possible from the Quota Share reinsurance;
   c. The smallest Surplus recovery possible in respect of a claim paid on a policy with a Sum Insured of $6m;
   d. The smallest proportional retention retained by the insurer on any risk;
   e. The number of lines of surplus cover used for a policy with a Sum Insured of *S*; and
   f. The circumstances under which the surplus recovery would exceed the retained portion of a claim.

[8]

ii. Outline briefly the factors contributing to the suitability of the above reinsurance programme for this insurer relative to other possible reinsurance programmes.

[4]
[Total 12]

QUESTION 2

A recently established general insurer writing personal lines insurance has only calculated regulatory capital requirement to date. It now also plans to calculate economic capital requirements.

i. Outline the merits of using deterministic and stochastic models for this purpose.

[4]

ii. Outline 5 additional potential uses, other than calculating economic capital requirements, for an economic capital model.

[5]
[Total 9]

PLEASE TURN OVER

QUESTION 3

i. Define the following:

a. Risk factor; and
b. Rating factor.

[2]

A large multi-national insurer is planning to launch a personal cyber insurance product. This product aims to indemnify policyholders against unauthorised deductions from their bank accounts as a result of them becoming victims of online scams in which they unintentionally provide their bank details to scammers .

ii. List possible rating factors for this product, explaining the relevance of each.

[6]

The insurer is considering offering customers the option (free of charge) to install internet usage monitoring systems on all their electronic devices. The systems would assess if the insured is accessing potentially risky sites and aim to protect the insured against online scams from well-known high-risk sites. The information gathered would hopefully reduce risk for the insurer and assist with pricing.

iii. Discuss the factors the insurer should consider before introducing this option.

[6]
[Total 14]

QUESTION 4

The general insurance industry in a developing country, Insureland, is currently unregulated. This has resulted in a number of new insurers entering the market. It has also resulted in a low level of trust in the industry by consumers resulting from:

- Unsettled claims due to insurers becoming insolvent; and
- Mis-selling of products, for example household contents insurance added to building insurance sold to individuals that did not need contents insurance.

As a result, the government is considering regulating the general insurance industry.

i. Outline briefly 8 regulatory restrictions or requirements that may be put into place to address the above problems

[4]

The insurance regulators of a number of developed countries have adopted a common standard of prescriptive rules and requirements relating to solvency regulations for their insurance industries.

ii. Outline the advantages and disadvantages to Insureland's government of adopting this same standard for the local insurance industry.

[5]
[Total 9]

PLEASE TURN OVER

QUESTION 5

i. Define the terms “uncertainty” and “risk” and describe the relationship between the two.

[2]

CIC is a recently-established general insurance company writing various classes of personal- and commercial-lines business in a number of territories in a particular country.

ii. Define what is meant by “operational risk”, and explain 6 distinct examples of operational risk possibly faced by CIC.

[8]

iii. Give 2 examples of unexpected events that may trigger further uncertainties and risks for CIC.

[2]

[Total 12]

QUESTION 6

You are an actuary of a large general insurance company. You have been asked to estimate the cost of excess of loss reinsurance on the current motor and public liability insurance book.

i. Define the following terms:

a. Aggregate deductible;
b. Non-ranking deductible;
c. Ranking deductible;
d. Trailing deductible;
e. Per occurrence limit. and
f. Annual aggregate limit.

[3]

You have access to a large database of individual claims data, as well as relevant exposure measures, for the past 10 years.

ii. Outline briefly how you would calculate the risk premium using a frequency severity model using the information on this database as well as any other factors you should consider.

[8]

iii. List the factors affecting an insurers appetite for offsetting its risks through reinsurance.

[3]

[Total 14]

PLEASE TURN OVER

QUESTION 7

i. Define "professional indemnity insurance" and distinguish between "E&O" and "D&O" professional indemnity cover.

[3]

A local general insurer writing professional indemnity cover has provided the following extract from its recent accounts.

Profit & Loss Account (R millions)	
	2021
Premiums earned	175
Claims incurred	149
Expenses paid	12
Decrease in DAC	2
Investment income	3
Taxation	4
Dividends paid	2

Balance Sheet (R millions)		
	Dec 2020	Dec 2021
Total assets	250	235
Unearned premiums	100	X
DAC	8	6
Outstanding claims	40	37
Share capital	25	25
P&L account	50	Y
Revaluation reserve	27	Z

ii. Determine the values for X, Y and Z in the above table, assuming that acquisition costs remain a constant proportion of written premiums.

[2]

iii. Calculate the following ratios for the insurer for 2021:

a. Loss ratio;
b. Operating ratio;
c. Solvency ratio; and
d. Return on capital employed.

[3]

iv. Outline the limitations of comparing the above calculated ratios to those of a competitor.

[3]

The insurer is considering investing R100 million of assets in a government-issued index-linked 10-year bond.

v. Discuss the suitability of this investment for the insurer.

[5]

[Total 16]

QUESTION 8

i. Define "Incurred but not reported" (IBNR) reserve, and state 4 circumstances when IBNR may need to be calculated as a separate amount from the other claims reserves components.

[3]

You are the reserving actuary for a large general insurer. Your company calculates monthly IBNR reserves (on the published basis) by applying IBNR reserving percentages to the net of reinsurance premium earned in the year immediately preceding the month-end.

PLEASE TURN OVER

The IBNR reserving percentages are based on an actuarial investigation carried out during the last year-end reserving exercise (at 31/12/2020). The IBNR reserving percentages are specified per class of insurance.

As part of the current year-end reserving exercise (at 31/12/2021) the sufficiency of the IBNR (published basis) reserving percentages is being checked, which may result in the percentages being revised. Your company's reserving policy is to hold claims reserves at least at the 75th percentile on the claims reserve distribution.

You are busy drafting the current year-end reserving report. The report shows an estimate of the surplus held within the claims reserves (on the published basis). The surplus is defined as the claims reserves (on the published basis) less the actuarial claims reserves at the 75th percentile on the claims reserves distribution.

A summary of the information you require to calculate the surplus as at 31 December 2021 for the motor and liability classes is shown below (amounts in R millions).

Insurance Claims	Annual Net Earned Premium	IBNR reserving percentages (before review)	Outstanding Reported Claims Reserves as at 31/12/2021	Actuarial Claims Reserves at the 75th percentile as at 31/12/2021
Motor	1250	5%	35	85
Liability	500	7%	20	60

The above IBNR reserving percentages are those used during 2021 before being reviewed at 31/12/2021. Outstanding reported claims reserves are used for both the published results and for the actuarial claims reserve.

ii. Outline the advantages and disadvantages of calculating the monthly IBNR using your company's approach.

[5]

iii. For each class above estimate the surplus in the claims reserves (on the published basis) and comment on the results.

[4]

The actuarial claims reserves are currently undiscounted. However, you will be introducing discounting next year in 2022 to align to the new published reporting basis.

Your report includes a section on the impact of changes in the published reporting basis. Your investigations show that the most material impact will be due to discounting.

iv. For each class above discuss how discounting the actuarial claims reserves will impact the level of surplus reported as at 31 December 2021. You can assume that the IBNR reserving percentages remain unchanged from the previous year.

[2]

[Total 14]

END OF PAPER