

EXAMINATION

20 May 2015

Subject F203 — General Insurance Specialist Applications

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Candidates will be issued with instructions to log-in using a password (which you will be provided with at the exam center).*
2. *Candidates are required to submit their answers in Word format only using the template provided.*
3. *Save your work continuously throughout the exam, on your computer's hard drive that you have been provided.*
4. *You have 15 minutes at the start of the examination in which 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 both questions, beginning your answer to each question on a new page.*
8. *Candidates 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 on 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

You are an actuary consulting to a large South African personal lines insurer. You have been asked to review the homeowners insurance pricing model. The homeowners product works as follows: The policyholder specifies sums insured for each of three cover sections, namely: Buildings, Home Contents and Specified Portable Possessions. The total homeowners premium is calculated as the sum of the premiums of each of the three constituent sections. The following table shows the complete rating structure of the product.

Homeowners Section	Monthly Rate of Sum Insured
Buildings Cover	0.008%
Home Contents Cover	0.060%
Specified Portable Possessions	0.160%

An electrical malfunction in the company's main computer room caused a loss of the entire home contents claims database. All efforts to restore and recapture the lost claims information were unsuccessful.

Based on recently released crime statistics, which indicated significant differences between urban and rural house burglary incidence rates, one of the personal lines underwriters has suggested that the company should introduce "postal code" as a rating factor to the home contents cover rating structure. He has approached you for input on the matter.

- i) Discuss the process you would follow and considerations you would make to establish and implement a postal code rating factor for the home contents section. [15]

It is now three years later and the company has collected sufficient claims information and plans to review the home contents section pricing model. Traditionally, the company uses one-way and two-way analyses to review their rating structures.

- ii) Briefly outline the advantages and disadvantages of using one-way and two-way analyses as a method to review the home contents pricing model. [5]
- iii) Discuss how you would use GLMs to arrive at a risk premium model for the home contents section. [12]

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The management accounts department conducts valuations of the company's technical provisions as at 30 June and 31 December of each year for internal use purposes. You have been asked to assist with the setting of the IBNR claims reserve for the specified portable possession section.

The IBNR provision is calculated using a basic chain ladder method and incurred claims data. Policy terms stipulate that any claim reported later than six months after the incurred date will not be covered.

Previous valuation reports show that claims provisions set at 30 June 2012 were sufficient to cover ultimate run-off, but provisions set at 31 December 2012 were insufficient. From the 31 December 2013 valuation onward, an IBNER reserve was held over and above the IBNR reserve equal to 100% of the value of the IBNR reserve.

You are preparing for the valuation at 31 December 2014 and received the following information:

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Specified Portable Possessions - Projected Incurred Triangle (R'000)							Gross Premium Written	Total Projected Ultimate Claims at 31 Dec 2013	Total IBNR determined at 31 Dec 2013	Total Actual Ultimate Claims at 31 Dec 2014
Origin Month	Reported Month									
	0	1	2	3	4	5				
Jan-12	394	442	442	457	470	484	967		-	484
Feb-12	422	456	462	471	488	505	990		-	505
Mar-12	430	495	507	521	544	550	1 018		-	550
Apr-12	504	607	665	665	693	717	1 039		-	717
May-12	485	522	535	537	551	551	1 059		-	551
Jun-12	437	485	485	493	519	532	1 085		-	532
Jul-12	541	559	571	585	596	609	1 107		-	609
Aug-12	475	489	498	521	541	548	1 130		-	548
Sep-12	502	539	565	575	599	612	1 154		-	612
Oct-12	529	565	570	575	592	602	1 180		-	602
Nov-12	489	541	561	568	581	591	1 207		-	591
Dec-12	670	897	942	951	978	1,010	1 232		-	1,010
Jan-13	600	664	672	684	696	706	1 258		-	706
Feb-13	620	670	677	680	698	705	1 290		-	705
Mar-13	573	646	653	665	684	691	1 314		-	691
Apr-13	665	798	854	862	868	887	1 345		-	887
May-13	654	704	727	730	746	761	1 381		-	761
Jun-13	622	690	696	704	732	740	1 408		-	740
Jul-13	648	677	696	710	730	737	1 438		-	737
Aug-13	694	721	731	743	769	779	1 470	780	11	779
Sep-13	686	734	757	761	777	789	1 503	791	30	789
Oct-13	705	775	783	788	811	820	1 549	823	40	820
Nov-13	715	778	789	794	816	832	1 612	838	60	832
Dec-13	875	1,185	1,234	1,249	1,293	1,306	1 680	1,030	155	1,306
Total	13,935	15,640	16,072	16,289	16,772	17,063	30 416	4,262	296	17,063

The table below shows the development factors used in determining the IBNR claims reserve above.

	Reported Month					
	0	1	2	3	4	5
Development Factors	1.0937	1.0236	1.0120	1.0249	1.0139	1.0000
Grossing-Up Factors	1.1773	1.0765	1.0516	1.0392	1.0139	1.0000

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Specified Portable Possessions - Link Ratios						
Origin Month	Reported Month					
	0	1	2	3	4	5
Jan-12	1.12	1.00	1.03	1.03	1.03	1.00
Feb-12	1.08	1.01	1.02	1.04	1.03	1.00
Mar-12	1.15	1.03	1.03	1.05	1.01	1.00
Apr-12	1.20	1.09	1.00	1.04	1.03	1.00
May-12	1.08	1.02	1.00	1.03	1.00	1.00
Jun-12	1.11	1.00	1.02	1.05	1.02	1.00
Jul-12	1.03	1.02	1.02	1.02	1.02	1.00
Aug-12	1.03	1.02	1.05	1.04	1.01	1.00
Sep-12	1.08	1.05	1.02	1.04	1.02	1.00
Oct-12	1.07	1.01	1.01	1.03	1.02	1.00
Nov-12	1.11	1.04	1.01	1.02	1.02	1.00
Dec-12	1.34	1.05	1.01	1.03	1.03	1.00
Jan-13	1.11	1.01	1.02	1.02	1.01	1.00
Feb-13	1.08	1.01	1.00	1.03	1.01	1.00
Mar-13	1.13	1.01	1.02	1.03	1.01	1.00
Apr-13	1.20	1.07	1.01	1.01	1.02	1.00
May-13	1.08	1.03	1.00	1.02	1.02	1.00
Jun-13	1.11	1.01	1.01	1.04	1.01	1.00
Jul-13	1.04	1.03	1.02	1.03	1.01	1.00
Aug-13	1.04	1.01	1.02	1.03	1.01	1.00
Sep-13	1.07	1.03	1.01	1.02	1.02	1.00
Oct-13	1.10	1.01	1.01	1.03	1.01	1.00
Nov-13	1.09	1.01	1.01	1.03	1.02	1.00
Dec-13	1.35	1.04	1.01	1.04	1.01	1.00

iv) Discuss whether the IBNER reserve at 31 December 2013 was justified. Include all steps followed and show all calculations used to arrive at your conclusion.

[11]

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The chief financial officer wants to apply to the FSB to use the company's own method for calculating the IBNR claims reserve. However, he has questioned whether the FSB will approve the method used for the company's internal management accounts.

- v) Suggest improvements to the current method of setting the IBNR claims reserve for the specified portable possessions cover section.

[7]

[Total 50]

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QUESTION 2

- i) Outline the capital requirements under interim measures for South African short-term insurers. [10]

You are a consulting actuary advising a South African short-term insurer on capital planning. The latest assignment was delivery of the insurer's completed return under Solvency Assessment and Management's comprehensive parallel run that showed a solvency capital requirement ("SCR") coverage position of 0.8 times on the standard formula.

- ii) Explain, with reasoning, to the Chief Financial Officer the possible ways in which to increase the insurer's SCR coverage in the SAM regime. [33]

The chairperson of the Board of Directors has reviewed the proposed ways of improving the SCR coverage going forward.

- iii) Describe the implications of failing to meet a 1 times SCR coverage and outline other aspects the Board should consider in selecting their strategic response to the insufficient SCR coverage. [7]

[Total 50]

TOTAL 100

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END OF EXAMINATION