



**Report to ECC from the Board of Examiners**

*SEMESTER 2 2018*

*PART III*

*BOARD OF EXAMINERS' REPORT*

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# CHAIR'S REPORT SUMMARY

## 1. Examinations

The Semester 2 2018 Part III examinations of the Actuaries Institute ("Institute") were held from the 8<sup>th</sup> to the 16<sup>th</sup> of October 2018.

## 2. Pass Rates

The number of candidates presenting for the Semester 2 2018 Part III Exams, the number of passes and the resulting pass rates are shown in the table below, together with the corresponding numbers for the previous two exam periods.

### Pass Rates by Part III Course

	2018(2)			2018 (1)			2017 (2)		
	Sat	Pass	%	Sat	Pass	%	Sat	Pass	%
2A Life Insurance	71	18	25	78	22	28%	62	23	37%
2B Life Insurance	63	18	29	57	19	33%	49	15	31%
3A General Insurance	104	23	22	108	17	16%	91	24	26%
3B General Insurance	60	22	37	56	17	30%	53	21	40%
5A Invest. Man. & Fin.	22	4	18	n/a	n/a	n/a	21	3	14%
5B Invest. Man. & Fin.	n/a	n/a	n/a	26	5	19%	n/a	n/a	n/a
6A GRIS	n/a	n/a	n/a	19	8	42%	n/a	n/a	n/a
6B GRIS	15	6	40	n/a	n/a	n/a	20	7	35%
ST9 ERM	88	42	48	101	38	35%	97	26	27%
ST1 Health & Care	15	6	40	18	8	44%	19	5	27%
C10 CAP	88	47	53	80	43	54%	95	58	61%
<b>Total</b>	<b>526</b>	<b>186</b>	<b>35%</b>	<b>543</b>	<b>177</b>	<b>33%</b>	<b>507</b>	<b>182</b>	<b>36%</b>

The assessment for this semester comprised 10% online forum participation and 90% for three long answer exam questions.

The Chief Examiners aim to produce a consistent standard of passing candidates, rather than a consistent pass rate from year to year. The overall pass rate for this semester is 35%, which is higher than the 33% pass rate for the previous semester and lower than the 36% pass rate for Semester 1 2018.

The pass rate for C3A continue to remain consistently low. The view of the Board of Examiners is that this is at least partially driven by this being one of the first of the Part 3 subjects that most candidates sit. The pass rate for C2A decreased significantly and has only a slightly higher pass rate than C3A.

### Fellows

The number of members that will be made Fellows (subject to attendance at a Professionalism Course and paying any relevant exemptions) will be:

### Number of Fellows

2018 (2)	2018 (1)	2017 (2)	2017 (1)	2016 (2)	2016 (1)	2015 (2)
29	27	39	30	37	32	29

## Online Forum Participation

The online forum participation continued for all Institute delivered courses this semester except C10.

Students are required to post 2 original posts and 4 replies. A participation mark was awarded based on the quality of these posts.

The following table provides a distribution of the participation marks received by students (who sat the exam):

### Frequency Distribution for Semester 2 2018

Participation Mark	Subject						Total
	2A	2B	3A	3B	5A	6B	
10	32	45	53	16	16	5	177
9	29	5	18	23	4	3	91
8	4	9	27	15	1	2	66
7	2	0	2	1	0	0	12
6	0	1	0	1	1	0	9
5	0	0	0	2	0	0	7
4	2	0	0	4	0	0	10
3	2	0	1	0	0	1	7
2	0	0	1	0	0	3	6
1	0	0	0	0	0	0	1
0	1	3	4	0	0	1	9
<b>No. of Candidates</b>	<b>72</b>	<b>63</b>	<b>106</b>	<b>62</b>	<b>22</b>	<b>15</b>	<b>340</b>
<b>Average Mark</b>	<b>8.9</b>	<b>9</b>	<b>8.7</b>	<b>8.5</b>	<b>9.5</b>	<b>6.8</b>	<b>9.9</b>

Observations:

This is the final semester for which the forum mark is used as a form of assessment. Most of the Chief Examiners are comfortable to see it removed.

# EXAM ADMINISTRATION

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## 1. The Board of Examiners

The Board of Examiners oversee the Part III examination process of the Actuaries Institute. The Board of Examiners consists of the Chair and the Chief Examiners for each subject, supported by Institute staff.

The composition of the Board of Examiners for this semester was as follows:

### 1.2. BoE Chair

Chair: James Pettifer

### 1.3. Chief Examiners

Course 2A:	Life Insurance	Anthony Brien
Course 2B:	Life Insurance	William Zheng
Course 3A:	General Insurance	Daniel Lavender
Course 3B:	General Insurance	James Fitzpatrick
Course 5B:	Investment Management & Finance	Charles Qin & Claymore Marshall
Course 6A:	Global Retirement Income Systems	Stephen Woods
Course 10:	Commercial Actuarial Practice	Bruce Thomson

### 1.4. Assistant Examiners

The Assistant Examiners for this semester were:

Course 2A:	Life Insurance	Jun Song & Julian Braganza
Course 2B:	Life Insurance	David Ticehurst & Robert Herlinger
Course 3A:	General Insurance	Ryan Anderson & Andrew Teh
Course 3B:	General Insurance	Elaine Pang & Chao Qiao
Course 5A:	Investment Management & Finance	N/A
Course 6B:	Global Retirement Income Systems	Jim Repanis
Course 10:	Commercial Actuarial Practice	Matthew Ralph

### 1.5. Meetings of the Board

The Board met on three occasions this semester as part of the exam process as follows:

#### Meetings of the Board

Meeting	Purpose
19 July 2018	<ul style="list-style-type: none"><li>• Update on enrolment numbers and course offerings for this semester.</li><li>• Identify Chief &amp; Assistant Examiners and Course Leaders for each course for this semester.</li><li>• Outline the responsibilities of Chief Examiners and this semester's schedule.</li><li>• Review progress on the drafting of the exams to date</li></ul>
20 September 2018	<ul style="list-style-type: none"><li>• Discuss the status of this semester's examination papers, model solutions and sign-off process.</li><li>• Discuss the marking spreadsheets and review the recruitment of markers.</li></ul>
23 November 2018	<ul style="list-style-type: none"><li>• Review the recommended pass lists and treatment of borderline candidates.</li></ul>

## 2. Course Leaders

Course Leaders are appointed by the Institute to undertake a variety of tasks relating to modules 1-3 of the Part III education program. Course Leaders' draft examination questions, conduct tutorials, monitor forums and assess the online participation mark. The following is a list of the Course Leaders for this semester:

### Course Leaders

Course	Roles
2A	Exam: Stephen Edwards Tutorials, Forum Participation: Bruce Thomson
2B	Exam: Ashley Wilson, Peter Corbett, Lawrence Ng Tutorials: Gregory Bird Forum Participation: Han Gan
3A	Exam: Daniel Lavender Tutorials: Jeff Thorpe Forum Participation: Jacqui Reid
3B	Exam: Jacqui Reid Tutorials: Ben Qin Forum Participation: Mathew Ayoub
5A	Exam: Charles Qin, Claymore Marshall Tutorials, Forum Participation: Marlon Chan
6B	Exam, Tutorials and Forum Participation: Vivian Dang
CAP	Exam: David Service, Vivian Dang, Young Tan, Colin Priest, Tim Gorst, Gaurav Khemka Post-Course Assignment: Sharanjit Padam, Andrew Gale, Colin Priest, David Service
ST9	This course is run completely external to the Institute.
ST1	This course is run completely external to the Institute.

I would like to take this opportunity to thank all the members of the Board of Examiners and their assistants for their efforts in preparing and marking the examination papers. The management of the examination process is an extremely important function of the Institute and it is currently being run by a small group of committed volunteers.

### 2.1. Scrutineers

The Scrutineers for Semester 2 2018 were:

Course	Longer Answer Questions, Case Study Assignment and Exam
Course 2A	Janice Cheng, Amy McDonald, Kevin Chou
Course 2B	Grant Knapman, Charlene Yong and Oliver Li
Course 3A	Jeremiah Cheung, Timothy Brown, Yu Sun

Course	Longer Answer Questions, Case Study Assignment and Exam
Course 3B	Edwin Zhang, Michael Storozhev, Kelly Lee
Course 5A	Kevin Pun, Richard Dunn, David Shuvalov
Course 6B	Minjie Shen, Stuart Mules, Wen Liu
Course 10	Phin Wern Ting (Life Insurance) Lawrence Uy (Investments) Roman Kashkarov (Health) Akshay Basrur (GRIS) Sophia Liu (General Insurance) Roman Kashkarov (ERM) David Chan (ESG) Kevin Pun (Banking) Wan Wah Wong (Data Analytics)

### 3. Exam Administration and Supervision

The Board of Examiners was ably assisted by Institute staff in the Education Team, Tony Burke, Karenn Chhoeung, Carolina Vilches, Eleanor Mazando and AUSA Chanthaphone. They were responsible for administering the entire process and ensuring key deadlines were met, compiling and formatting the examination papers, distributing material to candidates and to exam centres, processing results and collecting historical information to produce this report. They did a great job and the Board of Examiners team is indebted to them all.

The Part III examinations were run by an external consultancy – Cliftons, a computer training venue.

Other examinations in temporary exam centres were administered by Fellows or other approved supervisors.

### 4. Exam Candidature

The mix of courses sat by candidates is broadly similar to that in previous years.

#### Candidate Mix by Part III Course

Subject	2018(2)	2018 (1)	2017 (2)	2017 (1)	2016 (2)	2016 (1)
Life Insurance	22%	32%	29%	27%	28%	31%
General Insurance	39%	38%	37%	39%	41%	38%
Investment Management & Finance	5%	6%	5%	8%	11%	8%
Global Retirement Income Systems	4%	5%	5%	5%	4%	4%
Commercial Actuarial Practice	20%	19%	24%	21%	16%	19%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

# BoE Members for Semester 1 2019

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## 1. Board of Examiners

The composition of the Board of Examiners for next semester, Semester 1 2019, is as follows:

### 1.1. Board of Examiners Chair

James Pettifer

### 1.2. Chief Examiners

Course 2A: Life Insurance	Anthony Brien
Course 2B: Life Insurance	William Zheng
Course 3A: General Insurance	Daniel Lavender
Course 3B: General Insurance	James Fitzpatrick
Course 5B: Investment Management & Finance	Charles Qin & Claymore Marshall
Course 6A: GRIS	Stephen Woods
Course 10: Commercial Actuarial Practice	Bruce Thomson

### 1.3. Assistant Examiners

Course 2A: Life Insurance	Julian Braganza, Jun Song
Course 2B: Life Insurance	David Ticehurst, Robert Herlinger
Course 3A: General Insurance	Ryan Anderson, Andrew Teh
Course 3B: General Insurance	Chao Qiao, Elaine Pang
Course 5B: Investment Management & Finance	N/A
Course 6A: GRIS	Jim Repanis
Course 10: Commercial Actuarial Practice	Matthew Ralph

## 2. Examination Dates

The dates for the examinations in Semester 1 2019 are as follows:

Module	Subject	Exam Date
1	SP1 Health & Care (IFoA)	11 April 2019
1	SP9 Enterprise Risk Management (IFoA)	15 April 2019
2	C3A General Insurance	23 April 2019
3	C3B General Insurance	24 April 2019
2	C2A Life Insurance	26 April 2019
3	C2B Life Insurance	29 April 2019
1	Life Insurance and Retirement Valuation	29 April 2019
3	C5B Investment Management & Finance	30 April 2019
2	C6A Global Retirement Income Systems	2 May 2019
4	C10 Commercial Actuarial Practice	3 May 2019

## 3. Examination Papers

The Board of Examiners have agreed to release this semesters examinations questions only for subjects where the marking guides will not be used as learning resources in Semester 1 2019.

**James Pettifer**

**Chair of the BOE 14/12/2018**



# EXAMINERS REPORTS SEMESTER 2 2018

## COURSE 2A LIFE INSURANCE

### 1. Summary

#### 1.1. Course Overview

The aim of the 2A Life Insurance Course is to provide the market, legislative and product knowledge, along with the skills and judgment, necessary for an actuary to tackle a range of management related problems in life insurance relating to underwriting and risk management, experience analysis, assumption setting and pricing.

#### 1.2. Assessment

The assessment model is broken down into two parts:

Forum Participation 10%

Long Answer Question Exam 90%

#### 1.3. Pass Rates

72 candidates enrolled this semester. Of these, 1 withdrew leaving 71 sitting the exam.

It is proposed that 18 candidates be awarded a pass, which implies a pass rate of 25.4%. Table 1 shows the historical pass rates for this subject:

**Course Experience**

SEMESTER	SAT	PASSED	PASS RATE
Semester 2 2018	71	18	25%
Semester 1 2018	78	22	28%
Semester 2 2017	62	23	37%
Semester 1 2017	65	13	20%
Semester 2 2016	66	14	21%
Semester 1 2016	82	16	20%
Semester 2 2015	57	18	32%
Semester 1 2015	65	20	31%
Semester 2 2014	56	25	45%
Semester 1 2014	62	16	26%
Semester 2 2013	59	25	42%
Semester 1 2013	50	26	52%

The 25% pass rate for this exam is lower than the 28% pass rate for the previous exam (Semester 1 2018) and lower than the historical average. There was some feedback suggesting that candidates felt it was a long exam and there was some evidence of this in many candidates' paper. Markers also commented about poor quality of attempts indicating a lack of understanding rather than lack of detail in answers.

It is always a challenge to consider whether the exam paper is written to the appropriate level of knowledge / complexity consistent with the level of detail and breadth of coverage in the course materials and textbook to challenge a candidate's ability to apply judgement and analysis without having to have any experience component in their learning. We rely on the

scrutineers for this assessment and there was no indication that the length or complexity was inappropriate.

Candidates had the opportunity to demonstrate their knowledge with parts of some questions having many alternatives to earn the available marks yet these were generally answered poorly with candidates earning less than half the potential marks.

## **2. Assessment**

### **2.1. Overall Performance**

It was pleasing to see an improvement in the average mark for forum participation this semester indicating a greater level of involvement and interaction by candidates but this did not translate into better performance in the exam. No candidate achieved an above average performance in more than one question though many did pass two out of the three questions.

Much of the paper was relatively straightforward but required candidates to be concise and not spent too much time on these elements so that they had adequate time to consider the more challenging judgement aspects in the paper.

All three questions are closely related to topical issues confronting the Australian life insurance industry and were worded specifically to look at the issues from the life insurance side so as to ensure no superannuation knowledge was assumed or required and provided candidates with ample opportunity to demonstrate their knowledge and understanding by directing them to certain aspects required in the answer. Despite this, many candidates failed to adequately consider the issues and challenges from different perspectives and provided overly narrow or incomplete answers.

Markers indicated that many responses did show signs of candidates running out of time consistent with general feedback following the exam and so set pass marks reflecting this whilst still ensuring the cut-off mark chosen provided an appropriate differentiation between candidates who demonstrated sufficient knowledge and understanding and those whose answers were lacking.

### **2.2. Exam Question by Question Analysis**

#### **Question 1**

This question looks at group risk death and TPD cover provided via a superannuation fund. It provides basic details of the cover offered and expected loss ratio and starts by asking candidates to calculate the expected premium and claims. It then asks candidates to describe other terms and conditions they would expect on the TPD cover given the nature of the membership and what issues they can foresee in terms of premium, sum insured and default cover and what changes they would propose to remedy these.

Candidates are then presented with changes similar to those proposed in the Protecting Your Super budget changes and asked to estimate the impact on in-force premium, claims loss ratios and premium rates and draft a memo covering the risks associated with implementing the changes, whether they will address the problem of erosion of account balances and suggest alternative terms and changes that would address the risks and erosion issue.

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
<b>Total Marks Available</b>	<b>60.0</b>	<b>60.0</b>			
Strong Pass	36.5	36.5	60.8%	4	6%
Pass	30.5	30.5	50.8%	13	18%
Slightly Below Standard	27.5	27.5	45.8%	11	15%
Below Standard	19.5	19.5	32.5%	27	38%
Weak	11.5	11.5	19.2%	13	18%
Showed Little Knowledge	1.0	1.0	1.7%	3	4%
Did Not Attempt	0.0	0.0	0.0%	0	0%
Maximum Mark	42.5	42.5			
Average Mark	24.6	24.6			
Standard Deviation	7.5	7.5			
Co-efficient of Variation	0.31	0.31			

Candidates performed poorly on this question, with a pass rate of 23.9% on what was felt to be a reasonably straight forward and topical question.

Most candidates answered part a)i) well but a few fell over with the average sum insured in part a)ii). Full marks were awarded in part a)ii) if candidates followed the right approach but got part a)i) wrong.

Less than a third of candidates achieved the 3 required available in part b) despite there being 13 possible marks identified in the marking guide. Pre-existing condition exclusions, minimum working hours requirements and inclusion of a waiting period were the most common mentioned elements.

Part c) was very poorly answered. Most common answers got 1 mark for not needs based benefits or any discussion on the SI scale plus 1 mark for any rectification so most at least got 2 for this (I and II combined). But the average was only 3.4 out of a possible 10.

The average mark for part d) was 2.4 out of a possible 7. Most candidates said premium would fall (0.5 marks) but only a few got that it would fall substantially (even if they didn't use the average balance ( $\$0.6b/100,000 = \$6,000$ ); very few provided an estimate. Overall there was very poor understanding and not many marks were awarded for other than explaining the higher loss ratio and higher premiums.

Most candidates correctly identified 3 risks in part e), the most common being operational, reputation and mispricing but not many got more than that; hence poor relative to the marking guide.

Only half a mark was awarded in part e) ii) if the candidates just said not a good design as higher premium erodes balance. If they said this and something else, they got the full mark provided it was coherent and relevant.

Overall the standard was quite poor; particularly on part c).

## Question 2

In this question candidates are told they work as a pricing actuary for a reinsurer who primarily focuses on retail income protection business and have been approached by a bank-owned insurer seeking to reinsure their direct income protection business that is sold to customers in conjunction to mortgage business. Key features of the product are described, and it is noted that the product had an additional feature added three years ago.

Candidates are first asked to explain the difference between medical and financial underwriting and how they mitigate risk in selling income protection, and then to list the product terms, underwriting and other protections they would expect a bank-owned insurer would use in selling direct business.

The question asks candidates to suggest reasons why reinsurance might be sought for this portfolio and to describe what adjustments would need to be made to retail pricing assumptions relating to lapse and claims incidence for use in pricing this business.

Candidates are provided with a spreadsheet containing data and analysis of termination experience for this portfolio and are told they can assume the underlying claims data and analysis have been checked and are free of error, but the approach taken may need modification as the work was done by an inexperienced junior. The question describes how candidates can easily remove or change the weighting for each claim used in the analysis and that the junior has surmised that the existing termination basis is a good fit for the data. Candidates are asked to perform their own analysis and propose termination rate and offset assumption with justifications based on the analysis and what the experience indicates. Finally, candidates are asked what further analysis should be done, why it is important and what data would be needed to conduct it.

	<b>Marks Required</b>	<b>Weighted Marks Required</b>	<b>% of Total Marks</b>	<b>Number of Candidates</b>	<b>Proportion of Candidates</b>
<b>Total Marks Available</b>	<b>60.0</b>	<b>60.0</b>			
Strong Pass	31.0	31.0	51.7%	2	3%
Pass	23.0	23.0	38.3%	13	18%
Slightly Below Standard	20.7	20.7	34.5%	8	11%
Below Standard	19.0	19.0	31.7%	8	11%
Weak	15.0	15.0	25.0%	22	31%
Showed Little Knowledge	1.0	1.0	1.7%	17	24%
Did Not Attempt	0.0	0.0	0.0%	1	1%
Maximum Mark	32.3	32.3			
Average Mark	18.3	18.3			
Standard Deviation	5.5	5.5			
Co-efficient of Variation	0.30	0.30			

In part a), most candidates were able to provide variations of definitions of medical and financial underwriting but many failed to link it back to an IP context, which was specified in the question. Some candidates also failed to gain full marks where they didn't adequately describe the difference between medical and financial underwriting.

General terms and conditions were expected for part b) and most candidates were able to list down at least a couple of points. Weaker answers listed generic product features that are not relevant to the question e.g. suggesting to age 65 benefit period when the question has specified that benefit period is linked to personal loan period which is 3-5 years, and the failure to recognize that there is a reliance on financial underwriting to be performed by the bank.

Part c) is bookwork and most students have performed well. There were quite a few comments about seeking reinsurance because experience has been adverse, but some may not necessarily realize that there would be a cost attached to this and that reinsurers are not there to only absorb losses. Most students provided points in relation to reinsurer expertise, freeing up

capital and reducing exposure to volatility.

Stronger answers made obvious comparisons of direct against retail business for part d). These candidates have a good understanding of retail assumptions and then propose and comment on the changes they would make. For example, most candidates were able to acknowledge the lack of underwriting in direct business but only a few took the required step further and addressed changes to the selection period under retail assumptions. There also seems to be a misconception that retail business does not offer agreed value benefit design.

Many candidates failed to identify the impact of terms and conditions, such as pre-existing condition exclusions.

Part e) was marked purely based on the numbers proposed. No explanation was expected and marks were awarded with relatively more leniency.

Part f) was very poorly answered. There was some indication that many candidates had left this question/section to the last and may have run out of time. The markers commented that it was disappointing because going through a standard thought process on experience analysis and listing down potential areas of investigation should have prompted better attempts on the spreadsheet work. In terms of contextualization, most candidates failed to realize that the analysis is performed from the reinsurer's standpoint. It appeared that candidates were not familiar with the technicalities of a termination study. For example, among students who had an attempt on the spreadsheet, many tried to exclude benefit expiry from exposure and/or exclude open claims from the analysis. There were quite a few candidates who failed to realize that an average versus expected of greater than 100% for termination is a positive outcome. There were also some who misunderstood the payout ratio as a claims loss ratio.

Many candidates also failed to perform the analysis on a sum insured basis (as opposed to count) or identify the impact of the product change.

Responses to part g) overall were rather generic without much elaboration. Candidates who managed to list down points relevant to (f) were awarded marks. Candidates failed to clearly articulate specifically why the analysis suggested was important and the specific data required, most responses just listed the analysis to be performed more generically. As with (f), it appears time may have been an issue with this question.

### **Question 3**

This question looks at the challenges associated with developing and selling a lifetime annuity style product to be sold to members of a large retail superannuation fund. It starts by asking candidates to explain the roles of the three regulators APRA, ASIC and ACCC in relation to this product and to suggest an appropriate high-level investment mix and explain why it is appropriate for the specific liability risks of the product.

Candidates are then asked to evaluate the product from a new business perspective, identifying customer needs, issue with the proposed distribution model and their view on take up rates.

Next candidates are asked to describe the process they would take to price the product, specifically identifying key assumptions, profitability measures and how to calculate a proposed discount for some members.

Finally candidates are presented with a list of cost centres associated with the business and asked to categorize them for expense analysis and describe how they would apply each of them in the pricing model (as a percentage of premium or otherwise).

	<b>Marks Required</b>	<b>Weighted Marks Required</b>	<b>% of Total Marks</b>	<b>Number of Candidates</b>	<b>Proportion of Candidates</b>
<b>Total Marks Available</b>	<b>60.0</b>	<b>60.0</b>			
Strong Pass	42.0	42.0	70.0%	4	6%
Pass	38.5	38.5	64.2%	11	15%
Slightly Below Standard	34.7	34.7	57.8%	14	20%
Below Standard	29.0	29.0	48.3%	21	30%
Weak	21.0	21.0	35.0%	17	24%
Showed Little Knowledge	1.0	1.0	1.7%	3	4%
Did Not Attempt	0.0	0.0	0.0%	1	1%
Maximum Mark	45.3	45.3			
Average Mark	32.2	32.2			
Standard Deviation	8.3	8.3			
Co-efficient of Variation	0.26	0.26			

Most candidates made a good attempt on this question and the pass mark was determined based on a holistic assessment of candidates' understanding of lifetime annuities and expense allocation with 21% of candidate passing this question.

Part (a): Bookwork question. A handful of candidates gave a list of roles and responsibilities of each regulator which were not relevant to the question. Most candidates failed to score higher as answers were not tailored to the product in question. Candidates seemed to have a better understanding of the roles of APRA and ACCC in relation to the life insurance industry compared to ASIC.

Part (b): Generally well attempted by candidates. Only a few failed to mention investment in inflation-linked bonds. Quite a number of students had no asset allocation towards cash and would rather invest in equities to manage liquidity risks.

Part (c) (i): Reasonably well attempted by candidates. It is surprising that some candidates did not mention about protection against longevity risk, which is a distinct feature of lifetime annuity products. Many candidates did not point out the adequacy of the regular payments depends on the size of the initial investment or remaining value after partial withdrawal. Candidates generally did not have enough discussions on how the product would meet the customer needs.

Part (c) (ii): Most candidates were able to identify issues with the lack of financial advice and sales driven remuneration of telemarketers. Marks were also given for candidates mentioning older people not being tech-savvy enough for the online sign-up. Most students did not mention lost referrals due to discontinuity between cold call and online sign-up and the lag before sale. Several candidates did not realise that telemarketers are only allowed to provide general advice.

Part (c) (iii): Very well attempted with most candidates scoring full marks.

Part (d): A few candidates answered the question "describe the process you would take when pricing this product", before answering the questions in the sub-section but no additional marks were given for this.

Part (d) (i): Reasonably well answered by candidates. Many candidates struggled to explain the importance of the key assumptions. This seems to show that candidates tend to miss out on the obvious reasoning under exam conditions.

Part (d) (ii): Generally well attempted by candidates. However, there appears to be some misunderstanding of capital requirements for annuity products. Some candidates mistook new business strain with capital strain, resulting in confusion over whether IRR would be able to provide a reasonable indication of profitability.

Part (d) (iii): This sub-section appeared to be the hardest for Q3. Many candidates focused on how to estimate the take-up of the discount in order to determine the discount, which seemed circular. Better candidates were able to identify that assumptions may differ between discounted and regular policyholders and the impact on profitability targets. A small number of candidates raised the concern of lapse risk and more stringent underwriting, which are not relevant to lifetime annuities.

Part (e): Reasonably well answered by candidates. However, a number of candidates failed to categorize overheads into maintenance costs. Most candidates did not provide any reasoning for their categorization and it appeared that some candidates may have been running out of time.

# COURSE 2B LIFE INSURANCE

## 1. Summary

### 1.1. Course Overview

The aim of the 2B Life Insurance Course is to provide the knowledge, skills and judgment necessary for an actuary to tackle a range of management related problems in life insurance relating to valuation techniques, capital management, profit analysis, valuation of a company, reporting of results and professionalism.

### 1.2. Assessment

The assessment model is broken down into two parts:

Forum Participation 10%

Long Answer Question Exam 90%

### 1.3. Pass Rates

65 candidates enrolled this semester. Of these, 2 withdrew, leaving 63 candidates sitting the exam.

It is proposed that 18 candidates be awarded a pass, which implies a pass rate of 29%. Table 1 shows the historical pass rates for this subject:

**Table 1 – Course Experience**

SEMESTER	SAT	PASSED	PASS RATE
<b>Semester 2 2018</b>	<b>63</b>	<b>18</b>	<b>29%</b>
Semester 1 2018	57	19	33%
Semester 2 2017	49	15	31%
Semester 1 2017	52	18	35%
Semester 2 2016	46	15	33%
Semester 1 2016	50	11	22%
Semester 2 2015	50	17	34%
Semester 1 2015	53	21	40%
Semester 2 2014	51	20	39%
Semester 1 2014	60	22	37%
Semester 2 2013	44	17	39%
Semester 1 2013	43	11	26%
Semester 2 2012	43	17	40%
Semester 1 2012	52	13	25%

The 29% pass rate for this exam is slightly lower than the 33% pass rate for the previous exam (Semester 1 2018) and slightly lower than the historical average of 33%.

## 2. Assessment

### 2.1. Overall Performance

The quality of the submissions to the Forum continues to be very high. It is however surprising to continue to see a handful of candidates not attempting to meet the minimum requirements.



The performance in the Long Answer Questions was broadly consistent with the previous semester overall, and continues to be variable. As with past semesters, this component covered a range of topics and contained a mix of:

- Spreadsheet work and written responses.
- Sections requiring simple and complex judgment.
- Components that were prescriptive and others that were open (inviting candidates to raise and discuss points in relation to the topic at hand).

This made the questions good discriminators, in particular, when assessing the borderline candidates.

Consistent with previous semesters, some candidates performed very well on one or two of the Long Answer Questions but performed poorly (in some cases very poorly) on the other(s). Only a handful of candidates appeared strong across all areas of assessment.

Most candidates appeared to complete the exam. However, some candidates were let down by:

- Devoting too much time to certain parts of the exam, leaving them little ability to demonstrate the required knowledge, understanding and judgment in other parts.
- Not reading and/or answering the question correctly – for example citing calculation error as a reason for the differences in the Analysis of Profit and Experience Investigation results in part a) of question 3, when it was specifically highlighted in the question instructions that candidates should assume there are no errors in the analysis.
- Not addressing the circumstances described in the question, and instead giving a generic textbook answer (which may not have relevance).
- Not assessing the reasonableness of the numbers coming out of their calculations – for example in the calculation of excess assets in part b) of question 1.

Many candidates failed to demonstrate an understanding of:

- Shortcomings and modelling risks in assuming that all claims incurred are fully settled by the end of the year, especially for TPD business.
- Impacts of reinsurance arrangements on the profits, capital base and Insurance Risk Charge of a life company, allowing for a reinsurance commission and particular reinsurance coverage dates.
- Reasons why the analysis of profit may show different results from an experience investigation over the same period.

The presentation of reasonable arguments to back up conclusions and apply complex judgment was missing in many cases, with the quality of explanations often weak for such candidates.

## 2.2. Exam Question by Question Analysis

### Question 1

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
<b>Total Marks Available</b>	<b>64.0</b>	<b>64.0</b>			
Strong Pass	49.0	49.0	76.6%	3	5%
Pass	41.0	41.0	64.1%	17	27%
Slightly Below Standard	36.9	36.9	57.7%	14	22%
Below Standard	29.0	29.0	45.3%	17	27%
Weak	21.0	21.0	32.8%	5	8%
Showed Little Knowledge	1.0	1.0	1.6%	6	10%
Did Not Attempt	0.0	0.0	0.0%	1	2%
Maximum Mark	50.0	50.0			
Average Mark	35.7	35.7			
Standard Deviation	9.7	9.7			
Co-efficient of Variation	0.27	0.27			

**Question 1** focused on a financial services company looking to establish a life insurance company to write group insurance business. The underlying focus on the question related to business planning and capital projections.

Candidates were initially asked to determine the cashflow, capital requirements and excess asset projections for the next 10 years using the spreadsheet provided. The remainder of the question required candidates to identify the characteristics and shortcomings of the approach undertaken in the modelling and the ability to describe a method of valuing the business.

This question was generally answered reasonably well, with a pass rate of 32%.

For part a), most candidates did well with the cashflow projection of premiums, claims and expenses with better candidates being able to correctly project the assets and liabilities, and allowing for the investment earnings correctly. It was disappointing to see that some students were not able to understand basic balance sheet concepts.

Most candidates made several errors, with better candidates only making one or two. The most common errors across part a) were:

- For the cashflow and balance sheet projection:
  - Not aggregating the tranches of new business premium (despite the instructions to ignore lapses)
  - Having a non-zero policy liability, despite the question stating that all claims incurred in the year are settled by the end of the year
- For the insurance risk charge:
  - Not allowing for project costs or expenses
  - Not allowing for reinsurance
  - Not allowing for expected profits

- Where their projection indicated that Excess Assets were negative (insolvent) due to calculation error, not specifically highlighting that this is likely to be indicative of an error.

Part b) i) was generally well done. Most students were able to identify valid checks to be performed on the proposed assumptions used in the projection model. Better candidates provided detail and linked their response to the specifics of the question (e.g. identifying that the assumptions were provided by a reinsurer). Weaker students provided brief answers that were lacking in detail and little justification of why the checks listed should be performed.

Part b) ii) was generally well done. Most students were able to identify the advantages and disadvantages of the current target surplus calculation, understanding that whilst it was simple and easy to calculate, it did not explicitly allow for risk appetite. Good alternative Target Surplus approaches were generally provided by students.

Part b) iii) and b) iv) were generally poorly done. Most students were able to identify the advantages and disadvantages of the current target surplus calculation, understanding that whilst it was simple and easy to calculate, it did not explicitly allow for risk appetite. Good alternative Target Surplus approaches were generally provided by students (e.g. setting Target Surplus as a given % probability of breaching PCA).

Part c) had mixed responses. While most candidates were able to provide further assumptions required for an Appraisal Value calculation as well as the components of an AV, only a few were able to highlight how an Appraisal Value calculation could be performed leveraging the projection that has already been performed. Many students were able to identify alternative valuation approaches (such as the P/E ratio approach). Very few candidates were able to obtain full marks in identifying the advantages of Embedded Value techniques in the calculation of the Appraisal Value.

## Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
<b>Total Marks Available</b>	<b>58.0</b>	<b>58.0</b>			
Strong Pass	41.0	41.0	70.7%	10	16%
Pass	36.0	36.0	62.1%	20	32%
Slightly Below Standard	32.4	32.4	55.9%	10	16%
Below Standard	26.0	26.0	44.8%	14	22%
Weak	18.0	18.0	31.0%	8	13%
Showed Little Knowledge	1.0	1.0	1.7%	1	2%
Did Not Attempt	0.0	0.0	0.0%	0	0%
Maximum Mark	48.5	48.5			
Average Mark	33.7	33.7			
Standard Deviation	7.8	7.8			
Co-efficient of Variation	0.23	0.23			

**Question 2** focused on a large Australian life company writing lump sum and disability income. The company has been making losses in the disability income book and candidates were presented with 2 reinsurance options to reduce earnings volatility and provide a more stable return on equity.

Based on a simple table of provided information, candidates were initially requested to determine the policy liability under existing arrangements and assuming one of the reinsurance

options had been selected. The remainder of the question then focused on the impact of the reinsurance options on profit and capital, advantages and disadvantages of each option, and additional information that should be requested from the reinsurers.

More complex analytical and communication skills were then tested by requiring candidates to draft a written response to the CEO addressing the potential option of a transfer of the lump sum portfolio to another primary insurer.

This question was generally answered quite well, with a pass rate of 48%.

Part a) was well done, with most candidates scoring full marks on the calculation of the policy liability before reinsurance.

Part b) was poorly answered with the majority of students receiving no marks. Common errors were to not allow for reinsurance commission in the calculation of the reinsurance profit margin and calculating the reinsurance BEL incorrectly by not correctly allowing for the expense allowance in the premiums.

Part c) was generally poorly done. A common error in the calculation of the 2019 profit was not understanding that the reinsurance commission would not be recognised in profit immediately nor recognising that overall profits would be lower due to a transfer of profits to the reinsurer. Not many students understood that the overall impact on the capital base was positive due to the commission having no corresponding deduction (other than potential tax implications). Some students did not appear to read the question properly and stated that Reinsurance Offer 1 would reduce the IBNR and therefore IRC, not realising that Reinsurance Offer 1 only covered future claims.

Part d) was well done by most students. Most candidates were able to identify the key advantages and disadvantages of the two reinsurance treaties. Weaker responses were lacking in detail or made statements that indicated a misunderstanding on the specifics of the reinsurance arrangements and their implications (e.g. claim coverage period).

Part e) was answered reasonably well. Many students were able to identify key terms and conditions to be discussed and negotiated before signing the treaty. A wide range of valid responses were provided such as recapture terms, nature of the asset transfer and payment schedules. Better responses outlined why these terms and conditions were important (as required by the question), while weaker responses were lacking in detail or justification.

Part f) had mixed responses. Almost no candidates compared the advantages and disadvantages of a transfer of the lump sum portfolio relative to the alternative of 100% quota reinsurance and instead most assessed against the alternative of not performing a transfer. The question was therefore marked allowing both bases, with most students performing well taking this into account. Many students were able to identify a number of steps required as part of a transfer but only a few candidates mentioned specifically that a Part 9 process would be required. A wide range of responses were provided in relation to the key challenge required to be addressed in the course of a transfer, with the quality of responses being mixed.

Part g) had mixed responses. Many students correctly identified that the change in capital standards would increase the capital base due to an unlocking of the embedded value. However, a number of students failed to compare this to change in capital base with Reinsurance Offer 1.

### Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
<b>Total Marks Available</b>	<b>58.0</b>	<b>58.0</b>			
Strong Pass	37.0	37.0	63.8%	9	14%
Pass	32.0	32.0	55.2%	8	13%
Slightly Below Standard	28.8	28.8	49.7%	9	14%
Below Standard	22.0	22.0	37.9%	22	35%
Weak	18.0	18.0	31.0%	10	16%
Showed Little Knowledge	1.0	1.0	1.7%	5	8%
Did Not Attempt	0.0	0.0	0.0%	0	0%
Maximum Mark	47.5	47.5			
Average Mark	28.0	28.0			
Standard Deviation	7.4	7.4			
Co-efficient of Variation	0.26	0.26			

**Question 3** focused on a medium sized Australian life insurer with three RPGs with products covering lump sum mortality, lump sum morbidity and income protection risk.

The company is currently preparing the valuation assumptions to be used for the financial year-end. Candidates were supplied an excerpt of the year to date analysis of profit, a summary of the claims experience investigation over recent years and a forecast financial year-end position.

Candidates were asked to prepare responses to a number of questions relating to differences between the experience analysis and analysis of profit, recommending proposed changes to claims assumptions and assess the impact of assumption changes to the profit margin and profit for the Lump Sum Morbidity RPG. In the final part of the question, a price increase is proposed with candidates being asked to assess the impact on the level of loss recognition and potential impacts on policyholder behaviour.

Being the last question and with candidates perhaps being pushed for time this question was not as well answered as the previous questions. This question was generally answered reasonably well, with a pass rate of 27%.

Part a) i) was generally well done, with most students being able to identify valid potential reasons for the seemingly contradictory analysis of profit and experience investigation results. Better students were able to articulate how these reasons would impact the AOP and EI respectively. Weaker candidates provided answers that were lacking in detail and did not identify the differences between the Mortality and Morbidity RPGs. Despite the question stating that it should be assumed that no errors in the analyses, some students still raised this as a potential reason in their response.

Part a) ii) was generally poorly done, with many receiving no marks for this part indicating that there is some misunderstanding among students in how the CICP is calculated. A common error was highlighting the difference in the monthly benefit amount and actual claims paid (payment ratio) as a potential cause of the difference.

Part b) i) was generally well done. Better candidates were able to clearly outline their proposed assumptions and support them using information obtained from the analysis of profit and experience investigation. Weaker candidates did not consider overall experience trends (or the lack of one) in determining their proposed assumptions.

Part b ii) was generally well done, with most candidates being able to provide reasonable further investigations to perform on the claims experience. Weaker candidates provided responses which were lacking in detail and gave little justification as to why those further investigations were chosen.

Part c) was a relatively straight forward calculation question, and it was therefore surprising to see that many candidates not being able to correctly calculate the change in the profit margin % as a result of an assumption change to the expected claims or the change in profit in the following year. Most candidates understood that there would be no change in the 2018 reported profit, due to no change in the policy liability.

Part d i) had mixed responses. While most candidates correctly identified that the loss recognition accumulated would be carried forward and would need to be reversed in full to restore profit margins, only the better candidates were able to outline the components of accumulated losses and the requirements to reverse the loss recognition.

Part d ii) had mixed responses. Many students calculated this incorrectly, with a common error where they used the BEL as the denominator and dividing the PV of Premiums by this value in calculating the required premium increase, rather than using the \$20m loss recognition balance specified in the question.

Part d) iii) was very well done, with many candidates who answered this question (i.e. didn't run out of time) provided reasonable impacts (such as additional lapses) that may result as a result of a premium increase. Stronger students were able to identify that the premium increase calculated in Part d ii) was rather small and was unlikely to have an impact on policyholder behaviour.

# COURSE 3A GENERAL INSURANCE

## 1. Summary

### 1.1. Course Overview

The aim of the 3A General Insurance Course is to provide the knowledge, skills and judgment necessary for an actuary to tackle a range of problems in general insurance relating to products, accident compensation schemes, valuation techniques, accounting and management information.

### 1.2. Assessment

The assessment model is broken down into two parts:

Forum Participation 10%

Long Answer Question Exam 90%

### 1.2. Pass Rates

111 candidates enrolled this semester. Of these, 5 withdrew and 2 did not present, leaving 104 sitting the exam.

It is proposed that 23 candidates be awarded a pass, which implies a pass rate of 22%. Table 1 shows the historical pass rates for this subject:

**Table 1 – Course Experience**

SEMESTER	SAT	PASSED	PASS RATE
<b>Semester 2 2018</b>	<b>104</b>	<b>23</b>	<b>22%</b>
Semester 1 2018	108	17	16%
Semester 2 2017	91	24	26%
Semester 1 2017	92	23	25%
Semester 2 2016	91	21	23%
Semester 1 2016	106	35	33%
Semester 2 2015	82	23	28%
Semester 1 2015	90	28	31%
Semester 2 2014	76	15	20%
Semester 1 2014	66	17	26%
Semester 2 2013	76	14	18%
Semester 1 2013	96	31	32%
Semester 2 2012	96	29	30%
Semester 1 2012	103	29	28%

The pass rate of 22% is notably higher than the Semester 1 2018 and consistent with the average pass rate over the past 4 semesters. Passing candidates seemed to have good course knowledge and the ability to use that knowledge in a way that was relevant to the questions.

The pass rate for 3A General Insurance is generally lower than that of other Part III subjects, primarily driven by the large number of enrolled students that attempt this subject for the first time, and that this subject tends to be one of the first Part III subjects attempted by many candidates.

## **2. Assessment**

### **2.1. Overall Performance**

The quality of the submissions to the Forum continues to be very high. It is, however, surprising to continue to see a handful of candidates not attempting to meet the minimum requirements. In some cases, these marks can mean the difference between passing and failing.

Consistent with previous semesters, some candidates performed very well on one or two of the Long Answer Questions but performed poorly (in some cases very poorly) on the others – poor exam technique appears to be the main reason for this. Only a handful of candidates appeared strong across all areas of assessment.

Like other exams in recent semesters this exam was not considered to be a lengthy exam. Time management continues to be an issue for students taking this subject with many not allocating their time appropriately between each of the questions. Often, candidates devote too much time to certain parts of the exam, leaving them little ability to demonstrate the required knowledge and understanding of a passing candidate in other parts. In many cases, responses in one or two questions will be quite verbose, unstructured and repeat the same point multiple times while in other questions the answers will be too brief and not reach the level of detail required. Candidates should consider structuring their responses to provide clear and detailed responses for each question.

Question 1 proved to be the most challenging question in this exam that resulted in being a good discriminator when assessing borderline candidates. Many candidates did not perform well in this question for either lack of attempt, not including all of the required components in their responses, or not critically thinking about the issues specifically related to claims made policies. To provide examples, some candidates:-

- Used answers from past exam solutions and applied it to this portfolio without understanding its irrelevance to the context of the question;
- Provided a general valuation basis to apply rather than critically assessing the background information and providing a valuation basis specific to the circumstances of the portfolio provided; and
- Didn't respond to all aspects of the question, i.e. many candidates did not explain the 'differences' between the claims made and incidents occurring bases in part ci) or didn't consider the implications to short-term capital requirements in part ciii).

It is apparent that candidates attempting this course generally do not have strong critical thinking and practical skills to get through. Candidates attempting this course should invest significantly more in:-

- improving time management, comprehension and writing skills;
- critical self-assessment to learn from their mistakes in their practice attempts; and
- familiarising themselves with different general insurance products, situations, functions, and stakeholder perspectives.



## 2.2. Exam Question by Question Analysis

### Question 1

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
<b>Total Marks Available</b>	<b>60.0</b>	<b>60.0</b>			
Strong Pass	32.0	32.0	53.3%	5	5%
Pass	27.0	27.0	45.0%	13	12%
Slightly Below Standard	24.3	24.3	40.5%	17	16%
Below Standard	19.0	19.0	31.7%	32	30%
Weak	15.0	15.0	25.0%	22	21%
Showed Little Knowledge	1.0	1.0	1.7%	15	14%
Did Not Attempt	0.0	0.0	0.0%	2	2%
Maximum Mark	36.3	36.3			
Average Mark	20.8	20.8			
Standard Deviation	6.9	6.9			
Co-efficient of Variation	0.33	0.33			

Question 1 examined a medical indemnity portfolio and the issues around claims made policies and the impact of changing to a claims incurred basis. The question comprised of three parts. This question proved to be a good discriminator between passing and failing candidates.

#### Part a)

Part ai) examined whether candidates understood the various components typically included in a medical indemnity claim. This question was well attempted however no candidates correctly identified that 'plaintiff' legal costs are included in the settlement, with the majority simply stating, 'legal costs'. The average mark was 2.5/4.

Part aii) required candidates to identify which component from part ai) they considered would be the largest and most uncertain for the insurer. Most candidates correctly identified economic loss but the better candidates were able to provide suitable justifications. The average mark was 0.9/2.

Part aiii) required candidates to identify four legislative reforms that the government could impose to control cost escalation in medical indemnity claim. Despite candidates been instructed to reference similar legislative reforms and the solution being provided in the text book, many candidates copied answers from previous exam questions for CTP with answers that focussed on changing to a no fault scheme. This demonstrated a general lack of understanding of medical indemnity. The average mark was 3.1/8.

Part iv) required candidates to discuss the impact that the introduction of a statute of limitations may have on the future provision. This question required some judgement with many candidates able to identify that claim numbers are expected to reduce but most struggled with the remaining aspects. The average mark was 2.7/8.

**Part b)** allowed candidates to apply judgement to determine an appropriate valuation basis for the portfolio. Many candidates identified the basics with few recognising the separation of large claims, despite this being apparent from part a). Interestingly, only two candidates identified that conversion from notification to fully-fledged claims would be required. Overall, this question was poor with the average mark of 3.2/8.

### Part c)

Part ci) required candidates to explain to the managing director the difference between claims made and claims incurred and why medical indemnity is normally underwritten on a claims made basis. Interestingly, many candidates defined what the claims made and claims incurred bases were without identifying what the 'differences' between the two bases were. The average mark was 1.8/4.

Part cii) required candidates to apply judgement to discuss the impact on the medical indemnity portfolio in the years following a change from a claims made basis to a claims incurred basis. Many candidates were able to identify the slowdown of the claims reporting pattern however the better candidates were able to assess the impact on the PPCI factors and make a correct assessment to the ultimate number of claims. This question was answered poorly with the average mark of 3.6/12.

Part ciii) required candidates to apply judgement to explain to the managing director the impact that changing from a claims made basis to a claims incurred basis would have on the outstanding claims provision and the impact on the existing reinsurance arrangements, with specific commentary required on the impact to short-term capital requirements. This question was answered poorly with many candidates receiving no marks. Candidates generally struggled to understand the impact of the mismatch of reinsurance coverage and a high number of candidates did not specifically comment on the impact on the outstanding claims provision or mention capital, despite being asked for in the question. Interestingly, no candidates identified that the insurer no longer needs the run-off cover. The average mark was 3.1/14.

## Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
<b>Total Marks Available</b>	<b>60.0</b>	<b>60.0</b>			
Strong Pass	46.5	46.5	77.5%	4	4%
Pass	39.5	39.5	65.8%	35	33%
Slightly Below Standard	35.6	35.6	59.3%	8	8%
Below Standard	28.0	28.0	46.7%	26	25%
Weak	19.0	19.0	31.7%	20	19%
Showed Little Knowledge	1.0	1.0	1.7%	11	10%
Did Not Attempt	0.0	0.0	0.0%	2	2%
Maximum Mark	50.5	50.5			
Average Mark	32.7	32.7			
Standard Deviation	11.0	11.0			
Co-efficient of Variation	0.34	0.34			

Question 2 examined the impact that various types of reinsurance options would have on an insurance company's claims costs and profit position to assist the company in deciding which reinsurance option to purchase. A total of 28 of the 60 marks available were for calculations with the remaining marks available for qualitative analysis and judgement.

### Part a)

Part ai) required candidates to calculate the net claims cost under 5 different reinsurance scenarios, requiring a simple understanding of how different types of reinsurance works. Candidates tended to score highly with the average mark of 9.0/12.

Part aii) required candidates to justify whether the mean term (duration) of the net liabilities would increase, decrease or remain the same if changing the existing

reinsurance program to one of the four options. Many candidates were not able to articulate the impact on the mean term to a satisfactory standard with many incorrectly justifying the impact relative to no reinsurance program. The average mark was 1.0/4 with no candidates scoring full marks.

#### **Part b)**

Part bi) required candidates to state whether the risk margin would increase or decrease when a per risk XoL limit was increased. Many candidates correctly identified that the risk margin would increase with the average mark of 1.1/2.

Part bii) required candidates to explain two circumstances where the risk margin under the quota share option would be lower than under the current XoL cover. This was poorly answered with many candidates incorrectly stating that the volatility would change once claims costs exceed the XoL limit, rather than understanding the break-even point was significantly higher than this given the existing quota share cover. The average mark was 1.3/4.

Part biii) was generally well answered with most candidates able to identify that the risk margin would not be zero, however only the better candidates were able to provide a suitable justification. Disappointingly, there were a number of candidates that had no problem suggesting a zero risk margin was appropriate. The average mark was 2.5/4.

#### **Part c)**

Part ci) required candidates to calculate the net claims costs under the various reinsurance options in the event of an exceptionally large claim and to calculate the resulting net profit. This was extremely well answered with many candidates scoring full marks. The average mark was 10.5/16.

Part cii) required candidates to explain to the CFO how the LAT can impact profit and to explain what probability of sufficiency the LAT should be conducted at. Many candidates copied the definition of the LAT calculation without referencing how profit is impacted. The better candidates were able to explain that profit is only impacted once the DAC and related intangibles have been fully-written down through the establishment of the unexpired risk reserve. Disappointingly, the vast majority of candidates incorrectly stated that the LAT is required, by APRA, to be conducted at the 75% probability of sufficiency. The average mark was 1.7/4.

Part ciii) required candidates to evaluate the suitability of the various reinsurance options given the CFO's concern that the portfolio may be exposed to exceptionally large claims. Many candidates identified that the quota share was less suitable than the other options but many did not reference this back to the CFO's concerns. The better candidates were able to identify surplus as the best protection for the insurance company, making reference to their calculations in the earlier parts of the question. The average mark was 3.3/6

Part civ) was an open-ended question to allow candidates to make further considerations before deciding on which reinsurance option to purchase. Many candidates identified that further scenario analysis would be useful, and that risk appetite and capital implications should be considered. Few suggested obtaining quotes from other reinsurers or considering a combination of reinsurances. Many of the points that were provided by candidates were of second order. Candidates would benefit from focusing their attention on the main issues, particularly when providing advice to executives. The average mark was 2.1/8.

### Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
<b>Total Marks Available</b>	<b>60.0</b>	<b>60.0</b>			
Strong Pass	44.0	44.0	73.3%	1	1%
Pass	34.8	34.8	57.9%	30	28%
Slightly Below Standard	31.3	31.3	52.1%	14	13%
Below Standard	24.3	24.3	40.4%	41	39%
Weak	14.0	14.0	23.3%	13	12%
Showed Little Knowledge	1.0	1.0	1.7%	5	5%
Did Not Attempt	0.0	0.0	0.0%	2	2%
Maximum Mark	47.0	47.0			
Average Mark	29.3	29.3			
Standard Deviation	8.6	8.6			
Co-efficient of Variation	0.29	0.29			

Question 3 examined the valuation considerations for a pet insurer and how potential changes to the product offered would impact claims experience and policyholder behaviour. The question was well answered with many candidates scoring highly. The better candidates responded to all elements in each question and were able to articulate their responses well.

#### Part a)

Part ai) required candidates to identify two key differences between insured and uninsured pets based on industry statistics provided. Most candidates correctly identified that the number of veterinary visits is higher for insured pets than for uninsured pets; however, few identified the second key difference that the number of insured pets is increasing faster than the number of uninsured pets with many incorrectly noting an increase in the average veterinary cost for insured pets. The average mark was 2.5/4.

Part aii) required candidates to provide reasons for each of the key differences observed in Part ai). Most candidates identified less financial disincentive for insured pet owners as a reason for more frequent visits to the vet. However, many candidates only identified one or two points or in some cases repeated similar points. The better candidates clearly identified distinct reasons for the drivers noted in ai). The average mark was 4.5/8.

Part aiii) required candidates to provide two examples of why the analyst should not automatically attribute an increase in the average claims cost to superimposed inflation. This question was poorly answered with the majority of candidates defining what superimposed inflation is rather than answering the question. The better candidates identified changes to the mix of breed types and changes to the mix of services provided. The average mark was 1.3/4.

#### Part b)

Part bi) asked candidates to discuss why the insurer may not set case estimates on claims. The question was answered well with most candidates identifying well-defined claim amounts based on the veterinary bills lodged as a reason for why there is little need to set case estimates. The average mark was 1.4/2.

Part bii) required candidates to discuss whether they considered the portfolio to be short or long tailed. Almost all candidates correctly identified the product to be short tail and correctly identified the short lodgement delay from incidence and short payment delay from lodgement. The average mark was 3.6/4.

Part biii) required candidates to discuss an appropriate valuation approach for this portfolio and to comment on any separation of data into cohorts and time periods that would be applied. Most candidates made valid points but justification was generally poor. Disappointingly, many candidates suggested using the ICD or PCE methods for this portfolio despite discussing that the company does not set case estimates in part bi). The average mark was 2.8/6.

Part biv) required candidates to list the various components included in the gross outstanding claims provision and comment on the relative quantum of each. Many candidates correctly listed the components as the question already provided a hint that IBNR is one of the components, but not many commented on the relative quantum. Better candidates correctly identified IBNR to be the largest component and IBNER, claims handling expenses and the risk margin to be small. The average mark was 2.9/6.

### **Part c)**

Part ci) required candidate to describe the impact of proposed changes to the product on the outstanding claims valuation next year, with specific instruction to consider claims experience and claims handling expenses. Many candidates identified at least one or more of the possible impacts on claims experience and claims handling expenses, however few candidates provided explicit comments on the impact on the valuation. The average mark was 5.7/14.

Part cii) focused on the differentiation between moral hazard and adverse selection with many candidates providing reasonable explanations. Candidates were also asked to identify the impact of two proposed changes to the product and whether they could expose the company to moral hazard, adverse selection or a combination of both. Few candidates were able to explain why moral hazard was not relevant for option one. The final part of the question required candidates to identify a single strategy to mitigate the risks of the two proposed changes. This required candidate to think critically but was generally poorly attempted. The average mark was 4.6/12.

# COURSE 3B GENERAL INSURANCE

## 1. Summary

### 1.1. Course Overview

The aim of the 3B General Insurance Course is to provide the knowledge, skills and judgment necessary for an actuary to tackle a range of management related problems in general insurance relating to the pricing of all general insurance products, as well as capital management and financial condition reporting.

### 1.2. Assessment

The assessment model is broken down into two parts:

Forum Participation 10%

Long Answer Question Exam 90%

### 1.3. Pass Rates

65 candidates enrolled this semester. Of these, 3 withdrew and 2 did not present, leaving 60 sitting the exam.

It is proposed that 22 candidates be awarded a pass, which implies a pass rate of 37%. Table 1 shows the historical pass rates for this subject:

**Table 1 – Course Experience**

SEMESTER	SAT	PASSED	PASS RATE
<b>Semester 2 2018</b>	<b>60</b>	<b>22</b>	<b>37%</b>
Semester 1 2018	56	17	30%
Semester 2 2017	53	21	40%
Semester 1 2017	73	33	45%
Semester 2 2016	75	27	36%
Semester 1 2016	55	17	31%
Semester 2 2015	54	20	37%
Semester 1 2015	54	20	37%
Semester 2 2014	63	23	37%
Semester 1 2014	61	16	26%
Semester 2 2013	64	17	27%
Semester 1 2013	62	22	35%

The 37% pass rate for this exam is consistent with the historical average. Candidates seemed to have good course knowledge but not the ability to use that knowledge in a way that is relevant to the question.

## 2. Assessment

### 2.1. Overall Performance

- The raw marks for this semester were consistent to last semester, reflecting three reasonably differentiating questions.
- Online participation mark average of 8/10 was similar to last semester. It is pleasing to see candidates continue to make good use of the online learning resource for the

course.

- All three questions proved to be good differentiators of candidates with a reasonable spread of results.
- Candidates generally finished the exam which seemed to be manageable within the time given and had a good spread of knowledge and judgement elements.

## 2.2. Exam Question by Question Analysis

### Question 1

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
<b>Total Marks Available</b>	<b>70.0</b>	<b>60.0</b>			
Strong Pass	62.0	53.1	88.6%	2	3%
Pass	49.0	42.0	70.0%	22	35%
Slightly Below Standard	44.1	37.8	63.0%	11	18%
Below Standard	35.0	30.0	50.0%	18	29%
Weak	0.0	0.0	0.0%	7	11%
Showed Little Knowledge	1.0	0.9	1.4%	0	0%
Did Not Attempt	0.0	0.0	0.0%	2	3%
Maximum Mark	67.5	57.9			
Average Mark	44.2	37.9			
Standard Deviation	12.4	10.6			
Co-efficient of Variation	0.28	0.28			

This question was relatively straightforward. It aimed to test candidates understanding and fitness to practice using a mono-line insurer selling a high commission/low benefit product in relatively low volumes. Some parts of the question were open to several interpretations and hence were challenging for both candidates and makers alike

Overall, the question was answered reasonably well. Only the strong candidates were able to go past the bookwork points to show the judgment and commercial awareness required to demonstrate fitness to practice.

**Part a):** Most have identified that 100% combined ratio may not be reasonable as insurers do require return on the capital deployed as profit margin. However, it was disappointing to see there's still a few that missed this critical point. Several also failed to distinguish between the actual and target CR. The candidates that scored well in this part presented a well thought, logical response that further commented on the application of investment income and profit margin in this scenario. The average mark for this part was 62% (2.5/4.0)

**Part b):** Most candidates identified correctly the trends in the financials as well as provided a recommendation, only a few covered the limitations and assumptions. The better responses considered the option of decreasing the premium rate given the actual CR was so much lower than the target. The average mark for this part was 66% (2.6/4.0)

**Part c):** Most candidates correctly highlighted the impact on investment income component of the pricing as a result of the change in commission structure, some continued to approximate the percentage and dollar impact and comment on business impact. However, several thought

the non-payment of commission on early termination as the main savings, not realizing that in practice commission would normally be clawed back anyway. The average mark for this part was 44% (1.8/4.0), the lowest % of all parts

**Part d):** This part was answered exceptionally well for most candidates, relative to the other parts of this question. The candidates that scored the full marks related back to the case study at hand, that BIC was a global diversified insurer with a small mono-line presence in Silpo. However very few realized that a higher capital requirement under the Internal Model could be appropriate to maintain solvency for insurers with a higher risk profile than implicit in the standard model. The average mark for this part was a high 86% (4.3/5.0)

**Part e):** While this part was answered fairly well, the confusion and ambiguity of the impact of the tyre product on Silpo's PCR or on BIC's international PCR, lead to low average marks. Less than a handful of responses failed to appreciate that deferring commission would materially increase assets. The average mark for this part was 56% (1.7/3.0)

**Part f):** This part was able to differentiate the candidates quite well, with the stronger responses providing well explained items within CTP actuarial pricing, offering a set of action steps to reconcile between the two sources. Whilst weaker responses tended to offer a 'shopping list' with vague reasoning and linkage to a recommendation.

The high scoring responses provided a well laid-out format and thought process, with a set of clear recommendations with rationale addressed appropriately at c-suite level.

Several candidates did not give the CEO well considered reasoning for the differences in pricing, instead created the impression of randomness. The average mark for this part was 61% (7.3/12.0)

**Part g):** This part was generally answered well by all, although the 'shopping list' approach featured. The average mark for this part was the highest, 90% (2.7/3.0)

## Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
<b>Total Marks Available</b>	<b>74.0</b>	<b>63.4</b>			
Strong Pass	43.0	36.9	58.1%	4	6%
Pass	31.5	27.0	42.6%	15	24%
Slightly Below Standard	28.4	24.3	38.3%	7	11%
Below Standard	21.0	18.0	28.4%	20	32%
Weak	14.0	12.0	18.9%	10	16%
Showed Little Knowledge	1.0	0.9	1.4%	4	6%
Did Not Attempt	0.0	0.0	0.0%	2	3%
Maximum Mark	46.5	39.9			
Average Mark	26.4	22.6			
Standard Deviation	10.5	9.0			
Co-efficient of Variation	0.40	0.40			

- Candidates performed poorly on this question, with a pass rate of 38%. Only four candidates received an "A" grade and fifteen candidates received a "B" grade out of a total of sixty candidates. The focus of the question was the application of first principles



in a non-traditional problem, and it is very disappointing to see a large proportion of candidates being uncomfortable in applying known concepts in a new environment.

- In recognition of this difficulty, the pass mark was set at 15 out of a possible 32 marks.

**Part a):** This part looked at understanding the drivers of price and demand in assessing a simple pricing strategy. Unfortunately, even though the question asked for the viability of each strategy, few candidates were able to articulate the flow on effects from significantly different prices from a competitor on long-term viability. The average for this part was 1.2/3

**Part b):** aimed to assess the candidate's ability to compare benefit schemes, it was apparent that few candidates did not spend enough time understanding the context of the question and the basic payout mechanisms. Very few candidates identified that the minimum payout for the Government scheme is the donation to charity. Candidates also lost marks by not explaining the difference in payouts, and as a result repeating the same scenarios a number of times. The average for this part was 1.4/3

**Part c):** tested judgment. This question asked candidates to assess an analyst's hypothesis. Unfortunately, most candidates did not comment on the validity of this hypothesis as asked by the question, and instead provided a hedged response arguing both ways. Candidates that did not identify the key flaw in the proposed logic were not awarded full marks. The average for this part was 1.0/3

**Part d):** asked the feasibility of applying a GLM to a portfolio. Most candidates did not recognise the context of the data in this question. The majority of candidates were able to provide a bookwork response on the appropriateness of GLMs for these purposes, however, only superior responses took into account not only the data limitations, but also the synthetic nature of the risk cost that makes standard techniques inappropriate. A large number of candidates also made the jump to machine learning techniques, suggesting a misunderstanding of the requirements of these models. The average for this part was 1.5/5

**Part e)i):** is a bookwork question. Candidates were given data to reinforce the complexities identified in part d . Unfortunately, it was clear that some candidates did not refer to the provided data in their response, as standard steps were provided for a GLM build, that were clearly copied from previous questions on GLMs, without any reference to the uniqueness of the situation. The bookwork nature of this part resulted in the best performing part of the question, with an average for this part of 2.8/4

**e)ii):** asked candidates to interpret and validate results. Candidates were able to identify the outputs of a model and interpret the results. However, candidates that did not identify the uncertainty surrounding some of the results, especially in the comment about age, did not show the level of judgement required for a pass grade. The average for this part was 1.7/4

**Part f):** is the worst performing part of the question, candidates were asked to apply first principles to comment on the appropriateness of reinsurance schemes for this question and assess their costs. The unusual nature of the product clearly threw a number of candidates with no attempts provided for just this section. Strong candidates were able to articulate why some reinsurance arrangements would obviously not be able to apply. The average for this part was 1.2/5

**Part g):** changed the focus of the question to a traditional line of business. Candidates had greater success in to articulate knowledge of a standard model for pricing risk. It was clear that candidates that had not encountered CAT models struggling to find how best to adapt the model for the change in dynamic shift. The average for this part was 1.5/3

**Part h):** as a follow-on from part g, candidates' judgement was tested on how risk changes

affect pricing in both the short and long-term. Unfortunately, only the stronger candidates were able to differentiate between the two horizons. The average for this part was 1.0/3

### Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
<b>Total Marks Available</b>	<b>66.0</b>	<b>56.6</b>			
Strong Pass	46.0	39.4	69.7%	11	18%
Pass	38.5	33.0	58.3%	10	16%
Slightly Below Standard	34.7	29.7	52.5%	11	18%
Below Standard	28.0	24.0	42.4%	10	16%
Weak	22.0	18.9	33.3%	12	19%
Showed Little Knowledge	1.0	0.9	1.5%	6	10%
Did Not Attempt	0.0	0.0	0.0%	2	3%
Maximum Mark	54.5	46.7			
Average Mark	33.6	28.8			
Standard Deviation	11.8	10.1			
Co-efficient of Variation	0.35	0.35			

In general, a number of candidates appear to have run out of time to provide comprehensive answers. Candidates generally answered parts a, b and c quite well. Many candidates answered parts d and e using very generic answers and did not use specific information provided in the question. Part f, g and h were the complex judgement questions that had various quality of answers.

# COURSE 5A INVESTMENT MANAGEMENT & FINANCE

## 1. Summary

### 1.1. Course Overview

The aim of the 5A Investment Management and Finance Course is to provide the knowledge, skills and judgment necessary for an actuary to tackle a range of management related problems in investment and finance relating to analysis of accounting information, valuation of debt securities, equity markets and portfolio management, company valuation and asset allocation.

### 1.2. Assessment

The assessment model is broken down into two parts:

Forum Participation 10%

Long Answer Question Exam 90%

### 1.3. Pass Rates

26 candidates enrolled this semester. Of these, 2 withdrew and 2 were absent for the exam, leaving 22 candidates sitting the exam.

It is proposed that 4 candidates be awarded a pass, which implies a pass rate of 18%. Table 1 shows the historical pass rates for this subject:

**Table 1 – Course Experience**

SEMESTER	SAT	PASSED	PASS RATE
C5A Semester 2 2018	22	4	18%
C5B Semester 1 2018	26	5	19%
C5A Semester 2 2017	21	3	14%
C5B Semester 1 2017	33	7	21%
C5A Semester 2 2016	43	23	63%
C5B Semester 1 2016	34	4	12%
C5A Semester 2 2015	49	10	20%
C5B Semester 1 2015	24	15	63%
C5A Semester 2 2014	32	17	53%
C5B Semester 1 2014	24	7	29%
C5A Semester 2 2013	41	21	51%
C5B Semester 1 2013	37	21	57%
C5A Semester 2 2012	30	17	57%
C5B Semester 1 2012	22	13	59%

The 18% pass rate for this exam is a slight improvement to the 14% pass rate for the previous exam (Semester 2 2017), but remains lower than the pass rates for course C5A observed during pre-2015. The Semester 2, 2018 C5A examination was very similar in style to the Semester 2, 2017 C5A examination, which may have contributed to the slightly higher pass rate. However, the chief examiners would like to note that no candidate achieved more than 50% of the raw marks in aggregate in the exam.

The Chief Examiners have been very conscious of writing a fair examination for the students that was very closely aligned to the syllabus. Feedback from the two External exam reviewers and the exam scrutineers was carefully taken into consideration. In the opinion of the Chief Examiners, the feedback on the drafted exam was generally positive. Feedback from the Course Leaders (post the examination) and various exam reviewers suggested that the questions in this examination have been closely aligned to the 5A syllabus.

## 2. Assessment

### 2.1. Overall Performance

The overall performance in this exam was below the Examiners' expectations. The Examiners were surprised at how poorly the students performed, given:

- All the preparation and co-ordination with the course leaders carried out during this semester.
- Similarity in style between the Semester 2 2018 and the Semester 2 2017 examinations.
- Closely alignment of the examination contents to the course syllabus.
- The tutorials for 5A this semester covered material that prepared for specific parts of this exam.
- Candidates were provided a voluntary assignment this semester that went into great detail on factor models. This assignment would have provided a good learning resource for Q3 of this exam, which covered factor models. Candidates generally performed worse than expected for question 3.
- The Chief Examiners are of the view that this was a fair exam, with close alignment to the syllabus. This view was also shared by the 5A Course Leaders and the 5A external examiner.

### 2.2. Exam Question by Question Analysis

#### Question 1

	<b>Marks Required</b>	<b>Weighted Marks Required</b>	<b>% of Total Marks</b>	<b>Number of Candidates</b>	<b>Proportion of Candidates</b>
<b>Total Marks Available</b>	<b>60.0</b>	<b>60.0</b>			
Strong Pass (A)	34.0	34.0	56.7%	1	5%
Pass (B)	30.0	30.0	50.0%	2	9%
Slightly Below Standard (C)	27.0	27.0	45.0%	2	9%
Below Standard (D)	22.0	22.0	36.7%	4	18%
Weak (E)	16.5	16.5	27.5%	4	18%
Showed Little Knowledge (F)	1.0	1.0	1.7%	9	41%
Did Not Attempt (X)	0.0	0.0	0.0%	0	0%
Maximum Mark	34.5	34.5			
Average Mark	19.3	19.3			
Standard Deviation	8.5	8.5			
Coefficient of Variation	0.44	0.44			

- Candidates performed poorly on this question, with a pass rate of 14%. The suggested Pass grade was initially set by both markers at 15/30.

- While candidates performed slightly better in the qualitative style questions, the answers were kept very general and failed to apply knowledge to bring out more specific points related to the context of the question. The majority of the candidates failed to demonstrate a satisfactory level of competency in the quantitative style questions.

**Q1 a):** This part of the question assesses candidates' knowledge of simply floating rate bond pricing, along with understanding of simple bond prepayments. Candidates are expected to be able to build simply cash flow models for bond pricing.

Some students missed the pre-payment in their modelling. Most who did include pre-payment schedules assumed that the prepayment occurred only once per year (instead of quarterly).

**Q1 b):** This part of the question focuses on understanding of drivers of bond spreads and various risk margins included in the pricing.

More than 90% of candidates got the point on liquidity risk. Very few Students were able to mention prepayments and none were able to discuss it in detail.

**Q1 c):** This part of the question assesses candidates' knowledge on valuation of floating assets under changes in interest rates and credit spreads respectively. Candidates are expected to be able to build simply cash flow models for bond pricing to quantify such effects.

Half of the candidates were able to show at least some knowledge.

**Q1 d):** This question is a continuation of part c), with a focus on qualitatively explaining the assumptions utilized in part c).

Nobody was able to get the point on the next coupon rate. Instead, most mentioned the assumption of parallel shifting in the yield curve.

**Q1 e):** This questions links Unit 1 ad Unit 2 of the course, by testing the knowledge of financial ratios possessed by candidates. The candidates were asked to calculate and draw business conclusions related to bond covenants, by assessing company financial ratios.

Nobody realized the need to take both constraints into account. The question was generally answered poorly, with about 20% of students mentioning the first constraint and about 15% of students mentioning the second.

**Q1 f):** This part was general question focusing the benefits of investing in MMLs from a pure asset only, as well as an ALM, perspective. The candidates are required to connect the dots between characteristics of the bond described with more general investment objectives.

Few students mentioned the point on price stability or recovery. Otherwise, the attempts by the candidates were fair and candidates were able to show at least some knowledge.

**Q1 g):** This question seeks candidates to explain how to model and capture the characteristics of MML in a stochastic ALM model.

Most students talked about stochastic simulation and the required process, however mostly generic text book answers. None specifically mentioned modelling MML in terms of liquidity constraints and very few specifically mentioned prepayment.

**Q1 h):** The question tests candidates' knowledge of general investment strategies and assets, and seeks candidates to provide alternative ways to gain exposure to the MML industries through other asset classes.

Very few talked about CDOs or equity investments. Instead most students mentioned using CDS to hedge the credit risk.

## Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
<b>Total Marks Available</b>	<b>60.0</b>	<b>60.0</b>			
Strong Pass (A)	31.0	31.0	51.7%	1	5%
Pass (B)	23.5	23.5	39.2%	3	14%
Slightly Below Standard (C)	21.2	21.2	35.3%	2	9%
Below Standard (D)	17.0	17.0	28.3%	6	27%
Weak (E)	14.0	14.0	23.3%	4	18%
Showed Little Knowledge (F)	1.0	1.0	1.7%	6	27%
Did Not Attempt (X)	0.0	0.0	0.0%	0	0%
Maximum Mark	33.5	33.5			
Average Mark	18.2	18.2			
Standard Deviation	6.7	6.7			
Coefficient of Variation	0.37	0.37			

- Candidates performed poorly on this question, with a pass rate of 19%. The suggested Pass grade was initially set by both markers at 12/30. Question 2 was overall the best attempted question in the entire examination.
- While candidates performed slightly better in the qualitative style questions, the answers were often kept very general and failed to apply knowledge to bring out more specific points related to the context of the question.
- While most candidates were able to complete the simple numerical calculations in a) of the question, only the better candidates were able to link understand the implications of share buyback / dividends on the calculation in b) and c). The hedge fund strategy in e) was only understood and correctly identified by the better candidates.

**Q2 a):** This question assesses candidates' knowledge of relationship between EBIT and EPS, and subsequently pricing of shares using EPS and P/E.

This question was correctly computed by many candidates.

**Q2 b):** This part of the question tests candidates' understanding of implications to the share price and P/E ratio under share buyback.

The better candidates were able to note that share prices do not change under share buyback, while P/E ratio may decrease. The weaker candidates stated the opposite, i.e. share prices increase while the P / E ratio remain static.

**Q2 c):** This part questions focuses on comparing dividend and share buyback from both a theoretical and practical perspective.

Most candidates seem to understand the theoretical equivalence between the two approaches. The better candidates were able to understand practical considerations such as tax and frictional costs

**Q2 d):** This question assesses candidates' understanding of the steps required to derive corporate level cash flows from shareholder cash flows.

Many candidates were able to recognize the need to adjust for interest expenses and accruals such as amortization and depreciation. Only the stronger students recognize the need for adjusting for capital expenditures, and tax adjustments

**Q2 e):** The question seeks candidates to identify a strategy and the expected profit under the strategy, to obtain profits under different price scenarios.

The better candidates were able to easily identify the appropriate investment strategy and compute the likely profits; the less qualified candidates did not seem to attempt the question,

**Q2 f):** The question seeks the candidates to identify and risk-assess the biggest risk associated with the strategy outlined in e).

Most candidates determined the greatest risk is deal falling through for regulatory or business reasons

**Q2 g):** The question asks candidates to list some accounting and process complications associated with the proposal merger

Many candidates provided were very generic responses.

### Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
<b>Total Marks Available</b>	<b>60.0</b>	<b>60.0</b>			
Strong Pass	43.0	43.0	71.7%	0	0%
Pass	29.0	29.0	48.3%	4	18%
Slightly Below Standard	26.1	26.1	43.5%	2	9%
Below Standard	22.0	22.0	36.7%	2	9%
Weak	15.0	15.0	25.0%	6	27%
Showed Little Knowledge	1.0	1.0	1.7%	8	36%
Did Not Attempt	0.0	0.0	0.0%	0	0%
Maximum Mark	34.5	34.5			
Average Mark	19.1	19.1			
Standard Deviation	8.0	8.0			
Co-efficient of Variation	0.42	0.42			

Candidates performed extremely poorly on this question, with a pass rate of 18%. This question examined factor models (Unit 4) and parts of Unit 5. The question was designed to have several straightforward question parts, given the difficulty students had with question on factor models in the 2017 5A exam. It tested working with time series factor models, offering a new twist on previous 5A factor model exam questions which have mainly focused on cross-sectional factor models. However, this added "Complexity" should not have been difficult to master, because the 5A tutorial for Unit 4 in 2018 covered time series factor models. Students also had the opportunity to reinforce their understanding of factor models this semester by completing the 2018 5A assignment.

**Q3 a):** This question asked the students to outline the steps involved in setting up a multifactor model, including data collection and parameter estimation. It was a straightforward question. Most students either earned close to full marks or 0 marks.

**Q3 b):** Students were asked to discuss the advantages and disadvantages of time series factor models relative to cross-sectional factor models. It was considered to be a straightforward question. The average mark was about 1 out of 2. Most students did not provide distinct advantages and disadvantages, often repeating the same point in different ways in their responses. There were so many points that could have been highlighted in this question.

**Q3 c):** Students were required to compute the factor risk and total portfolio risk in the spreadsheet supplied with the question. This calculation was almost identical to that in a question in the 2017 5A exam, and this calculation was also presented to the students in the 2018 5A tutorial on Unit 4. Clearly, this question was easy, familiar, and simply bookwork for a well-prepared student. It was disappointing to see that the average mark was about 0.5 out of 1. Some students did not even attempt to answer this question part.

**Q3 d):** This question was designed to test the student's understanding of how to interpret and use factor models in practice. It was worth 8 marks. While the context in this question was new, the approach to answering this question was similar to question parts presented in the 2017 5A exam. It was expected that well-prepared students would find answering this question manageable. The style of this question should have seemed familiar. All of the candidates found this question difficult; the average was about 1.5 marks (out of 8), and the top mark was 4 marks. It is also noted that the 5A assignment for this semester (for which only about 50% of candidates submitted attempts for marking) also tested understanding of factor models, which should have given the students extra practice with mastering factor models.

**Q3 e) i):** This question part was an extension of Q3 d) in that it further tested understanding of how to interpret portfolio factor exposures. It was poorly answered, with an average of about 0.75 out of 4 marks.

**Q3 e) ii):** This part was a "catch-all" question, giving students the opportunity to discuss other practical considerations associated with rebalancing a portfolio, such as transaction costs, taxes, etc. It was considered to be a straightforward question, but it was not well answered, with an average of about 0.5 out of 2 marks.

**Q3 f):** The student's understanding of statistical issues associated with fitting time series factor models was examined. It was designed to be a differentiator question, but worth just 2 marks due to its difficulty. Students found this question challenging.

**Q3 g):** Students were asked to discuss the pros and cons of investing in a crypto currency asset class. It was considered to be a basic question that gave room for all kinds of sensible responses. The average was about 1.5 out of 3 marks.

**Q3 h):** Students were asked to outline the steps of how they would perform asset allocation for a portfolio that might include the crypto asset class. This is a very practical, fundamental problem faced by investment portfolio managers. There was wide scope on what responses would earn marks for this part, with the opportunity for candidates to draw on industry experience. Simple discussions of portfolio estimation approaches would have earned marks. Even without industry experience, this question should have been manageable, because part of the 2018 5A unit 4 tutorial covered the basics of portfolio optimization as a refresher for candidates. It was not a well answered question, with the average being 1 mark (out of 3).

**Q3 i):** This was designed to be a differentiator question. Students were asked to consider two investment proposals, and discuss which proposal would likely have the largest impact on the future portfolio returns. Again, this is another very practical question that reflects the kinds of problems investment managers face at different points in time. Students found this question difficult.



# COURSE 6B GLOBAL RETIREMENT INCOME SYSTEMS

## 1. Summary

### 1.1. Course Overview

The aim of the GRIS 6B course is to provide the knowledge, skills and judgement necessary for an actuary to effectively tackle a range of issues as retirement income systems evolve away from group-based defined benefit schemes to individual defined contribution plans. The changing context has significant implications for product design, risk management and how scheme members are communicated with [sic]. Actuaries need the skills and knowledge to help design and manage schemes to best meet members' individual retirement income needs.

### 1.2. Assessment

The assessment model comprised:

Forum Participation 10%

Long Answer Question Exam 90%

### 1.3. Pass Rates

15 candidates enrolled this semester. All candidates sat the exam.

It is proposed that 6 candidates be awarded a pass, which implies a pass rate of 40%. The following table shows the historical pass rates for this subject:

**Table 1 – Course Experience**

GRIS	Course A Semester 1			Course B Semester 2		
Year	Sat	Passed	Pass Rate	Sat	Passed	Pass Rate
2018	19	8	42%	<b>15</b>	<b>6</b>	<b>40%</b>
2017	20	7	35%	14	4	29%
2016	17	7	41%	15	5	33%
2015	21	10	48%	17	7	41%
2014	15	9	60%	11	7	64%

The recommended pass rate halts a pattern of reducing pass rates in recent years (a result that mirrors 6A). However, it should be noted that the small number of students sitting this course means that each additional pass or fail has a greater impact on the pass rate than other subjects. The fact that this course has been discontinued after 2019 may have affected and may yet affect the students enrolling.

## 2. Assessment

### 2.1. Overall Performance

Overall performance was weak compared to previous years. This was reflected in the low pass mark, low average mark, low highest mark, low number of questions passed and low number of candidates earning an automatic pass.

## 2.2. Exam Question by Question Analysis

### Question 1

	Marks	Weighted	%	Candidates	Proportion
<b>Total Marks Available</b>	40	60			
(A) Strong Pass	29	43.5	73%	1	7%
(B) Pass	25	37.5	63%	5	33%
(C) Slightly Below Standard	22.5	33.75	56%	3	20%
(D) Weak	18.5	27.75	46%	2	13%
(E) Showed Little Knowledge	14.5	21.75	36%	3	20%
(F)	1	1.5	3%	1	7%
(X) Did Not Attempt	0				
Maximum Mark	30.5				
Average Mark	21.7				
Standard Deviation	5.5				
Coefficient of Variation	0.26				

40% of candidates passed this question. It was a reasonable differentiator with moderate to high correlation to course outcome.

The question concerned a successor fund transfer.

Part (a) implications to the transferor company.

Part (b) financial implications of offering voluntary accumulation conversion to the transferring members.

Part (c) estimation of the accrued liability under a proportionate approach and an actual accrual approach and explanation of the differences.

Part (d) formulation of a suitable basis for compulsory accumulation conversion of all transferring members prior to transfer.

Candidates tended to perform well on this question if they were able to evaluate reasonable numerical answers in part (c).

That being said, it was concerning that a lot of candidates missed easy marks by:

- despite knowing the part (c) formulae, somehow miscalculating and then failing to notice their error or spot check their answer was incorrect.
- discussing the SFT issues from a Trustee's perspective rather than focusing on the CFO's perspective as required by the question.
- failing to address the specific question asked of them.

## Question 2

	Marks	Weighted	%	Candidates	Proportion
<b>Total Marks Available</b>	40	60			
(A) Strong Pass	24.5	36.75	61%	1	7%
(B) Pass	20.5	30.75	51%	4	26%
(C) Slightly Below Standard	18.5	27.75	46%		
(D) Weak	14.5	21.75	36%	5	33%
(E) Showed Little Knowledge	6.5	9.75	16%	5	33%
(F)	1				
(X) Did Not Attempt	0				
Maximum Mark	26.5				
Average Mark	17.5				
Standard Deviation	4.3				
Coefficient of Variation	0.24				

33% of candidates passed this question. It was a fair differentiator with very high correlation to course outcome. In fact, the only candidate whose results in this question and overall were different was the top course performer!

The question concerned explanation of a defined benefit fund to a 'lay' person, savvy in financial concepts but not in actuarial techniques.

Part (a) implications to employer contribution rate of higher member contributions and higher investment returns.

Part (b) recommendation of simple calculations to approximate the experience of the fund for each key driver (ie valuation assumption).

Part (a) did not provide significant differentiation of marks between candidates. The typical reason for under-/outperformance was the thoroughness in addressing both the resignation and retirement benefit components of the question.

Part (b) was a strong determinant of overall performance. Better candidates understood the need to provide a simple formula given the purpose of the analysis and understood this in the context of the benefit design provided. Poorer students tended to "data dump" information (that is to say, provide as much vaguely relevant information as possible in the hope the required answer may be found somewhere in their expansive response), particularly from the Ferris "Analysis of Surplus" reading.

### Question 3

	Marks	Weighted	%	Candidates	Proportion
<b>Total Marks Available</b>	40	60			
(A) Strong Pass	24	36	60%	2	13%
(B) Pass	20	30	50%	3	20%
(C) Slightly Below Standard	18	27	45%	3	20%
(D) Weak	14.5	21.75	36%	4	26%
(E) Showed Little Knowledge	6	9	15%	3	20%
(F)	1				
(X) Did Not Attempt	0				
Maximum Mark	26				
Average Mark	17.3				
Standard Deviation	5.2				
Coefficient of Variation	0.30				

33% of candidates passed this question. It was a reasonable differentiator with moderate to high correlation to course outcome.

The question concerned the proposed introduction of a CIPR (comprehensive income product for retirement).

A formal report to the trustee was required to cover:

- description of the proposed CIPR: a pooled deferred annuity
- mitigation of investment risk during the deferral period
- consideration of an account-based pension option to mitigate investment risk
- possible member communications

Albeit targeting a topical issue, this proved quite a challenging question and few candidates got beyond the basic bookwork response to demonstrate a grasp of all the technical difficulties implied by the question. This reflected in a relatively low pass rate.

A number of candidates gave standard answers from the "Deferred Annuity vs Immediate Annuity" textbook but very few demonstrated understanding of the internally-run pooled deferred annuity variation.

There was a reasonable level of understanding of the moral hazards inherent with the CIPR (with option), although no candidate proposed the 'notional ABP' suggestion of the model solution.

# COURSE 10 COMMERCIAL ACTUARIAL PRACTICE

## 1. Summary

### 1.1. Course Overview

The Commercial Actuarial Practice (CAP) Course is designed to teach students to apply actuarial skills across a range of traditional and non-traditional areas by “contextualizing” actuarial solutions or approaches in the wider commercial environment.

The two assessment tasks are:

1. A take-home Post-Course Assignment (“Assignment”) on one of the 4 non-traditional topics: Banking, Health, Data Analytics or Environment-Social-Governance (ESG). It is worth 20% of the final mark. Approximately one-quarter of the students were randomly allocated to each topic, except that students were not allocated a topic they had not attended at their Residential course or a topic they had been allocated in a recent semester.
2. An 8-hour Case Study Exam (“Exam”) worth 80% of the final mark, under exam conditions with the use of a computer (open book, but no internet access). The candidates had to choose 1 question from the 5 mainstream topics - Life Insurance, General Insurance, Investment, Global Retirement Income Systems (GRIS) or Enterprise Risk Management (ERM), perform all the necessary analysis and prepare a substantial written report.

An overall pass requires a total of 50%, without necessarily passing the Exam.

### 1.2. Pass Rates

88 candidates completed the course. Of these, it is proposed that 47 be awarded a pass, representing a **pass rate of 53%**.

**Table 1 – Recent Course Experience**

Semester	Sat	Passed	Pass Rate %
<b>Semester 2 of 2018</b>	<b>88</b>	<b>47</b>	<b>53</b>
Semester 1 of 2018	80	43	54
Semester 2 of 2017	95	58	61
Semester 1 of 2017	90	37	41
Semester 2 of 2016	64	30	47
Semester 1 of 2016	80	45	56
Semester 2 of 2015	81	51	63
Semester 1 of 2015	78	47	60
Semester 2 of 2014	85	49	58
Semester 1 of 2014	86	52	60
Semester 2 of 2013	84	49	58
Semester 1 of 2013	74	39	53
Semester 2 of 2012	71	40	56
Semester 1 of 2012	82	47	57

### Analysis by Topic

The analysis by chosen Exam Topic is as follows:

Exam Topic	Candidates	No. of passes	Pass rate
ERM	23	15	65%
GI	17	10	59%
GRIS	2	2	100%
Invest	17	7	41%
Life	29	13	45%
Total	88	47	53%

For the second semester in a row, we are disappointed with the Investment and Life Insurance results.

### Analysis by Examination Centre

The results by examination centre were as follows:

Centre	Presented	Passed	Pass rate
Melbourne	13	10	77%
Perth	1	0	0%
Sydney	64	30	47%
<b>Sub-total Australia</b>	<b>78</b>	<b>40</b>	<b>51%</b>
Beijing	1	0	0%
Hong Kong	2	2	100%
London	1	1	100%
Malaysia	1	0	0%
Singapore	3	2	67%
Wellington	2	2	100%
<b>Sub-total Overseas</b>	<b>10</b>	<b>7</b>	<b>70%</b>
<b>Total</b>	<b>88</b>	<b>47</b>	<b>53%</b>

All these results are reasonable, accepting the volatility introduced by low numbers.

The 5 traditional-topic questions aim to be practical within the subject area, without necessarily being entirely and strictly within each Part III syllabus.

Topic	Course Presenter / Author
Health	Andrew Gale
Banking	David Service
ESG	Sharanjit Paddam
Data Analytics	Colin Priest
ERM	Tim Gorst
Life Insurance	David Service
Investments	Gaurav Khemka
GRIS	Vivian Dang & Young Tan
General Insurance	Colin Priest

Marker 1 for each topic was the author as above. David Service was Marker 2 for the 7 topics for which he was not Marker 1, in order to provide a standardizing view across all topics. Garry Khemka was Marker 2 for Banking, while Aaron Bruhn was Marker 2 for Life. Both Garry and Aaron have good familiarity with CAP.

This was Sharanjit's first semester in charge of ESG, following a handover briefing and induction from Naomi Edwards.

## 2. Post Course Assignment Results

Although marks and grades were given for the Post-Course Assignment, a pass/fail decision was not required for each candidate; this simply formed 20% of their overall mark.

Final scaled marks ranged from 34% to 84% with an average of 60%. This range and average are deliberately similar to previous semesters. Candidates were only given a grade (Fail, Pass, Credit, Distinction, High Distinction) but were also given a copy of their Assignment with marked-up comments from the Marker. We believe these comments are particularly useful to candidates.

70 of the 88 candidates were awarded a "pass" mark of 50% or more, with either 4 or 5 failures in each topic.

It was suggested to candidates that a Credit or better (as achieved by 43% of candidates, a little lower than in previous semesters) was a better indication of likely overall success. However, the correlation between Assignment and Exam marks remains low (see section 4.4).

### 2.1. Banking

The Banking case study required candidates to advise the Capland government on suggested options to help reduce the impact of drought on farmers. These options included a prohibition on foreclosures, a government guarantee of interest payments, and government takeover of defaulting loans.

This was poorly answered, with 50% failing on raw scores and none awarded a Distinction or High Distinction. Despite living and working among banks and politics, many students failed to recognize their interaction.

The scaling chosen was to add 9 marks to most Banking candidates. The lowest 5 were given larger additions, so that none had scaled marks below 40%. 4 still failed. Thus, students were not overly penalized by being randomly allocated to this topic which (as also in the previous semester) was apparently more difficult for students than we had expected.

With hindsight, of the 8 lowest Banking marks, none achieved a raw passing mark in the Exam, although 1 did pass overall thanks to a +2 adjustment.

## **2.2. Data Analytics**

The Data Analytics case study required candidates to advise a bank risk manager on more efficiently detecting money-laundering. In effect this required a method for ignoring the high number of false positives that suggested suspicious behavior.

This was well attempted, with a good range of marks and a satisfactory average of 60%. This topic was used as the base toward which the other topics were scaled. Small additions were given to the failing DA candidates, so that 2 marginal failures became bare passes.

## **2.3. ESG**

The ESG case study required candidates to advise a large bank on managing the long-term impacts of climate change on the bank customers' ability to pay their mortgages, considering 3 different climate zones.

This question was well answered, with most students dealing well with the issues and the uncertainties. The main adjustments to marks were additions to the lowest marks and subtractions from the highest marks.

## **2.4. Health**

The Health case study required candidates to advise a Not-For-Profit organization regarding the assumptions and issues to be considered if tendering to establish a hospital in a new satellite town.

The question was well answered, with a good spread of marks and only 2 candidates failing on raw scores. The scaling chosen was to subtract 6 marks from all raw scores, and again some increases for the lowest scores with decreases for the 2 raw scores of 90%+. One of the 2 additional failures this produced (scaled to 49%) had been given 45% by Marker 2 while the other had been given a bare 50% raw score by Marker 1.

**END**