



Report to ECC from the Board of Examiners

SEMESTER 1 2017

PART III

BOARD OF EXAMINERS' REPORT

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The Institute of Actuaries of Australia
ABN 69 000 423 656
Level 2, 50 Carrington Street
Sydney NSW 2000
Tel: +61 (0)2 9239 6100, Fax: +61 (0)2 9239 6170
www.actuaries.asn.au
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CHAIR'S REPORT SUMMARY

1. Examinations

The Semester 1 2017 Part III examinations of the Actuaries Institute ("Institute") were held from the 24th April to the 5th May 2017.

2. Pass Rates

The number of candidates presenting for the Semester 1 2017 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.

Table A: Pass Rates by Part III Course

	2017 (1)			2016 (2)			2016 (1)		
	Sat	Pass	%	Sat	Pass	%	Sat	Pass	%
2A Life Insurance	65	13	20	66	14	21	82	16	20
2B Life Insurance	52	18	35	46	15	33	50	11	22
3A General Insurance	92	23	25	91	21	23	106	35	33
3B General Insurance	73	33	45	75	27	36	55	17	31
5A Invest. Man. & Fin.	n/a	n/a	n/a	43	27	63	n/a	n/a	n/a
5B Invest. Man. & Fin.	33	7	21	n/a	n/a	n/a	34	4	12
6A GRIS	20	7	35	n/a	n/a	n/a	17	7	41
6B GRIS	n/a	n/a	n/a	15	5	33	n/a	n/a	n/a
*ST9 ERM	104	43	41	82	36	44	96	34	35
*ST1 Health & Care	20	7	35	19	7	37	15	3	20
C10 CAP	90	37	41	64	30	47	80	45	56
Total	425	138	34%	501	182	36%	424	135	32%

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 34%, which is lower than the 36% pass rate for the previous semester, but an improvement on 32% the pass rate for Semester 1 2016.

It is pleasing to see the increase in the pass rate for C3B from the previous semester. However, it is disappointing to see the continuing low pass rates for C2A, C3A and C5B. It is also disappointing to see the pass rate for C10 continue to fall from the previous semester.

3. Fellows

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

Table B: Number of Fellows

2017 (1)	2016 (2)	2016 (1)	2015 (2)	2015 (1)	2014 (2)	2014 (1)	2013 (2)
33	37	32	29	29	39	32	31

4. 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 1 2017

Participation Mark	Subject						Total
	2A	2B	3A	3B	5B	6A	
10	20	29	47	19	33	11	159
9	26	10	17	31	0	1	85
8	11	6	19	13	0	3	52
7	3	1	2	4	0	0	10
6	3	0	1	0	0	0	4
5	0	2	4	4	0	2	12
4	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
0	2	4	2	2	0	3	13
No. of Candidates	65	52	92	73	33	20	335
Average Mark	8.4	8.4	8.9	8.3	10.0	7.4	8.6

Observations:

- The engagement by students in the online forums continues to be very good. This is a pleasing result.
- It is pleasing to see that all 5B candidates achieved the maximum mark of 10/10. Overall the proportion of students achieving the maximum mark of 10/10 is 47% which continues to be at a high level.

EXAM ADMINISTRATION

1. 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:

Table 1: Course Leaders

Course	Roles
2A	Exam: Georgina Hemmings Tutorials, Forum Participation: Bruce Thomson
2B	Exam: Fei Zhang, Ashley Wilson, Peter Corbett Tutorials: Richard Land Forum Participation: William Zheng
3A	Exam: James Pettifer Tutorials: Jeff Thorpe Forum Participation: Jacqui Reid
3B	Exam: Jacqui Reid Tutorials: Ben Qin Forum Participation: Mathew Ayoub
5B	Exam: Charles Qin, Claymore Marshall Tutorials, Forum Participation: Marlon Chan
6A	Exam, Tutorials and Forum Participation: Vivian Dang
CAP	Exam: David Service, Mercer, Colin Priest, Bridget Browne, Gaurav Khemka Post-Course Assignment: Naomi Edwards, Andrew Gale, Colin Priest, David Service

2. The Board of Examiners

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

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

2.1. BoE Chair

Chair Gary Musgrave

2.2. Chief Examiners

Course 2A:	Life Insurance	Andy Siu
Course 2B:	Life Insurance	Danny Bechara
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

2.3. Assistant Examiners

The Assistant Examiners for this semester were:

Course 2A:	Life Insurance	Alice Truong & Catherine Watson
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 5B:	Investment Management & Finance	N/A
Course 6A:	Global Retirement Income Systems	Jim Repanis
Course 10:	Commercial Actuarial Practice	Matthew Ralph

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.

2.4. Meetings of the Board

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

Table 2: Meetings of the Board

Meeting	Purpose
19 January 2017	<ul style="list-style-type: none">• Update on enrolment numbers and course offerings for this semester.• Identify Chief & Assistant Examiners and Course Leaders for each course for this semester.• Outline the responsibilities of Chief Examiners and this semester's schedule.• Review progress on the drafting of the exams to date.• Discuss issues arising from the previous exam.
30 March 2017	<ul style="list-style-type: none">• Discuss the status of this semester's examination papers, model solutions and sign-off process.• Discuss the marking spreadsheets and review the recruitment of markers.
30 June 2017	<ul style="list-style-type: none">• Review the recommended pass lists and treatment of borderline candidates.

2.5. Scrutineers

The Scrutineers for Semester 1 2017 were:

Table 3: Scrutineers

Course	Longer Answer Questions, Case Study Assignment and Exam
Course 2A	Claire Greenwell, Steven Diep, Weiraun Wong
Course 2B	Wilson Leung, David Shuvalov, Teerapong Thaviwatanachaikul
Course 3A	Kelly Lee, Alex Chen, Angel Xu
Course 3B	Samuel Chu, Hongjie Qi, Michael Di Pilla
Course 5B	Keith Cheung, Jack Ding, Danny Wong
Course 6A	John DeRavin, Stuart Mules, Young Tan, Nathan Bonarius
Course 10	Phin Wern Ting (Life Insurance) Alex Leung (Investments) Anthony Locke (Health) Kar Kan Lo, Young Tan, Vivian Dang (GRIS) Michael Storozhev (General Insurance) Roman Kashkarov (ERM) Kris McCullough (ESG) Stephen Edwards (Banking) Wan Way Wong (Data Analytics)

3. Exam Administration and Supervision

The Board of Examiners was ably assisted by Institute staff in the Education Team, Sarah Tedesco, Karenn Chhoeung, Eleanor Mazando, AUSA Chanthaphone and Carolina Vilches. 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 venues are provided by an external consultancy – Cliftons, a computer training venue.

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

4. Exam Candidature

4.1. Candidate Mix

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

Table 4: Candidate Mix by Part III Course

Subject	2017 (1)	2016 (2)	2016 (1)	2015 (2)	2015 (1)	2014 (2)
Life Insurance	27%	28%	31%	27%	32%	29%
General Insurance	39%	41%	38%	35%	37%	37%
Investment Management & Finance	8%	11%	8%	13%	6%	9%
Global Retirement Income Systems	5%	4%	4%	4%	5%	3%
Commercial Actuarial Practice	21%	16%	19%	21%	20%	23%
Total	100%	100%	100%	100%	100%	100%

BoE Members for Semester 2 2017

1. Board of Examiners

The composition of the Board of Examiners for next semester, Semester 2 2017, is as follows:

1.1. Chair

Gary Musgrave

1.2. Chief Examiners

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

1.3. Assistant Examiners

Course 2A: Life Insurance	Julian Braganza, Catherine Watson
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 5A: Investment Management & Finance	N/A
Course 6B: GRIS	Jim Repanis
Course 10: Commercial Actuarial Practice	Matthew Ralph

2. Examination Dates

The dates for the examinations in Semester 2 2017 are as follows:

Table 5: Examination Dates

Module	Subject	Exam Date
1	ST1 Health & Care (IFoA)	Friday, 28 September
1	ST9 Enterprise Risk Management (IFoA)	Tuesday, 3 October
2	C3A General Insurance	Monday, 9 October
3	C3B General Insurance	Tuesday, 10 October
2	C2A Life Insurance	Wednesday, 11 October
3	C2B Life Insurance	Thursday, 12 October
3	C5A Investment Management & Finance	Friday, 13 October
2	C6B Global Retirement Income Systems	Monday, 16 October
4	C10 Commercial Actuarial Practice	Tuesday, 17 October

3. Exam Solutions

The Board of Examiners have agreed to release this semester's examination questions only for subjects where the marking guides will be used as learning resources in Semester 2 2017.

Gary Musgrave
Chair of the BOE
13th July 2017

EXAMINER REPORTS SEMESTER 1 2017

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

67 candidates enrolled this semester. Of these, 1 withdrew and 1 did not present, leaving 65 sitting the exam.

It is proposed that 13 candidates be awarded a pass, which implies a pass rate of 20%. Table 1 shows the historical pass rates for this subject:

Table 1 – Course Experience

SEMESTER	SAT	PASSED	PASS RATE
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%
Semester 2 2012	43	14	33%
Semester 1 2012	67	22	33%
Semester 2 2011	54	10	20%
Semester 1 2011	60	18	30%

The 20% pass rate for this exam is lower than the 21% pass rate for the previous exam (Semester 2 2016) and significantly lower than the historical average. Many candidates failed to demonstrate a reasonable understanding of the key concepts being tested or present reasonable arguments to support the points raised. Overall performance is further discussed in section 2.1.

2. Assessment

2.1. Overall Performance

As a result of the historically low pass rates in 2016, changes were made to the exam development process.. Despite these changes, the pass rate for this semester was 20%, which is similar to the historical lows in 2016 and is a disappointing result.

Performance in the forum participation component was strong, with a pass rate of 88%. As in previous semesters, the forum participation component was not a good differentiator of the quality of the candidates.

Overall, the examination component was poorly done. The examination questions were designed to cover a reasonable spread of topics and practice areas, with question 1 covering critical illness, question 2 covering investment guarantees and question 3 covering a number of topics, including income protection termination rates, adverse media attention on life insurance industry claim decline rates and the differences in cashflow profits between stepped and level premium business. As with previous semesters, there was a lack of consistency in the performance of most candidates across all three examination questions, suggesting a lack of broad understanding of the issues. Very few candidates appeared strong across all areas of assessment, with only four candidates scoring grades of B or better across all three LAQs. Many candidates did poorly in the parts of the LAQs requiring the application of complex judgement and often failed to provide reasonable, well-argued and detailed answers, which were a key differentiator. Similar issues were observed in prior semesters, where candidates had difficulty with the more open ended parts of the LAQs.

Performance in the spreadsheet calculation components of the LAQs was mixed. As in previous semesters, candidates continued to have difficulty in applying decrements correctly to a relatively simple profit testing scenario, with many candidates failing to allow for selection and multi-decrements correctly in Q1. For Q2, candidates were provided with the output of 1000 simulations and asked to calculate the cost of an investment guarantee using the simulation results provided. While many candidates did well, many other candidates failed to calculate the cost of the investment guarantee correctly using the simulation results or did not attempt the question at all.

Very few candidates appeared to have run out of time, so the length of the exam did not appear to be a contributing factor to the poor performance.

2.2. Exam Question by Question Analysis

Question 1

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	60.0	60.0			
Strong Pass (A)	39.5	39.5	65.8%	5	8%
Pass (B)	35.5	35.5	59.2%	13	20%
Slightly Below Standard (C)	32.0	32.0	53.3%	7	11%
Weak (D)	29.5	29.5	49.2%	15	23%
Showed Little Knowledge (E)	11.5	11.5	19.2%	22	34%
Did Not Attempt (X)	1.0	1.0	1.7%	3	5%
Maximum Mark	42.5	42.5			
Average Mark	29.7	29.7			
Standard Deviation	7.9	7.9			
Coefficient of Variation	0.27	0.27			

Question 1 was about a proposed change to the critical illness rider to a YRT product.

Markers' comments:

Once again candidates struggled with what was a relatively straightforward risk product pricing question which no doubt is well covered in the text.

The candidates that passed generally showed a consistent understanding of the concepts throughout the different parts of the question. Those in the C category generally struggled with one or more parts of the question; particularly, part (c) where there were 18 marks available (to score the 9 maximum). Detailed summary by part as follows:

Part (a)(i) - although being a text book cash flow modelling question, it wasn't answered too well. Only a few candidates attempted to model the reduction in YRT due to disease C so max marks were really 8/10 for most. Only 20 got 7 or more i.e. modelled it quite well. Up to 1 mark was deducted for poor approach but mainly only 0.5 was actually deducted so as not to double up on marks lost elsewhere. Common mistakes were:

- Applied selection discount incorrectly: either as a factor, rather than (1 - discount), failing to apply the discount after year 3, using YRT discount for CI or vice versa.
- Applied selection discount to premiums and not claims which was considered dangerous as gears the result badly negative.
- Modelled YRT and CI separately and combined results.
- Did not model I(x)

Part (a)(ii) - we added an additional mark if candidates stated decrements were independent; however, no marks were awarded in (a)(i) Col E for this as this was specifically related to selection. Most candidates got this mark but only a few better candidates discussed selection for the new diseases or an alternative CI basis e.g. a discount/loading. Hence, average was 1 mark. Note that a few students stated

independence but did not apply decrements in this way in part (i), hence only got 0.5 mark.

Part (b)(i) - a lot of candidates abandoned their calculations in (a) and tried to derive a PV answer using the given numbers * 115% - these candidates were generally penalised 0.5 mark where this applied to premiums and/or claims. Those that used their erroneous results from (a)(i) (x2300) and commented that they were probably wrong scored the full 3. Average was 1.9 so answered reasonably well (and we were lenient giving 1 mark for the loss ratio however it was derived)

Part (b)(ii) - this was answered quite poorly. More astute candidates who got erroneous answers were not penalised if they acknowledged that something was wrong and proceeded to answer (b)(ii) logically about what they would expect to see. Most got the marks for higher premiums (due to sales uplift) and CI loss ratio but the rest was answered poorly. Average around 2 from a maximum of 6 marks.

Part (c) - At the end we had 18 available points from which to score the max 9 marks. Despite this, the responses were quite poor. Most candidates got marks for market alignment, reputation, anti-selection and reduced profitability; marks for all the other points were dispersed. The average for this part was 4.2; which is quite poor given the 18 marks available.

Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	60.0	60.0			
Strong Pass (A)	42.5	42.5	70.8%	3	5%
Pass (B)	35.0	35.0	58.3%	16	25%
Slightly Below Standard (C)	31.5	31.5	52.5%	7	11%
Weak (D)	20.5	20.5	34.2%	26	40%
Showed Little Knowledge (E)	13.5	13.5	22.5%	9	14%
Did Not Attempt (X)	1.0	1.0	1.7%	3	5%
Maximum Mark	44.0	44.0			
Average Mark	28.5	28.5			
Standard Deviation	9.1	9.1			
Coefficient of Variation	0.32	0.32			

Question 2 was about the proposed fees to be charged for a unit linked product with an investment guarantee.

Markers' comments:

Part (a) of the question was a fairly simple calculation exercise with half of candidates getting the answer correct and scoring close to full marks. Some candidates applied the business mix assumption to calculate an overall cost of guarantee which was generally okay, and some candidates calculated the answer via a probability based method, and marks were also rewarded for these approaches. Few did not get the right answer or took an approach that did not indicate a clear understanding of what the question was asking.

Part (b) of the question was quite broad and allowed candidates to identify and consider all relevant risks and mitigation approaches for the specific product. Overall, this was a

fairly straightforward question to answer and, in this context, candidates were awarded marks for their ability to think broadly and creatively across a range of risks and mitigation approaches. In general, candidates were able to identify some material risks, however too few mitigations were listed and therefore did not score enough marks overall. Many responses were focussed on risk avoidance rather than risk mitigations and few candidates touched on the risks associated with selective policy lapses and mitigation approaches for that. Some candidates tended to get parts (b) and (c) mixed up, noting that the question for part (b) did not mention that fees would necessarily be the same for both options. Not many candidates clearly matched mitigations with corresponding risks. Overall, this part of the question was not well answered.

Part (c) of the question was generally done quite well. Good answers were able to cover off on all aspects of the question in good detail. Most candidates were able to identify the inherent cross subsidises and understand its implications. Few were able to understand the need for a business mix assumption when setting a single fee and the impact of the assumptions differing from expected. Some candidates provided a lot of detail on the different fees that could apply to a unit linked product with little application to the facts of the question. A surprising number of candidates showed that they did not read the question properly by addressing the memo to the Head of Marketing rather than the Appointed Actuary.

Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	60.0	60.0			
Strong Pass (A)	48.0	48.0	80.0%	0	0%
Pass (B)	31.0	31.0	51.7%	19	29%
Slightly Below Standard (C)	27.9	27.9	46.5%	6	9%
Weak (D)	20.0	20.0	33.3%	27	42%
Showed Little Knowledge (E)	12.0	12.0	20.0%	9	14%
Did Not Attempt (X)	1.0	1.0	1.7%	4	6%
Maximum Mark	43.0	43.0			
Average Mark	26.3	26.3			
Standard Deviation	8.4	8.4			
Coefficient of Variation	0.32	0.32			

Question 3 was a broad question which covered a number of topics, including income protection termination rates, adverse media attention on life insurance industry claim decline rates and the differences in cashflow profits between stepped and level premium business.

Markers' comments:

Common themes

- Students answering the wrong part of question
- Students repeating themselves ie making same comment in different words as a different point
- Students restating the background of the question – this is not an efficient way of attempting the exam

- Students failing to discuss wider considerations e.g. in part (a) only focus on experience analysis and part (b) only focus on improving claims handling but not discussing wider scope of actions that insurers facing an issue can take

Part (a) – It was disappointing to see too many students missing the point of part (a). Many students went down the path of assuming the Head of Claims' statement indicated experience was poor so missed the majority of marks on doing an experience analysis ie they missed simple / obvious points such as "Experience analysis to assess actual versus expected termination rates", "Expect to see A/E ratios less than 1 which would indicate that actual claims terminations are less than expected". Some students discussed incidence rates. A couple confused incidence rates and incidence volumes in relation to higher claims volumes and the implication on terminations.

Part (b) – Many students got parts (i) and (ii) confused. Overall, this part was not performed well, with most students missing the key points. Given that this was a recent topical issue, students who have been keeping up to date with industry news should have had little difficulty with this part.

Part (c) – The graph was generally drawn correctly, although one student had stepped premiums higher than level premiums at all ages. Few students put labels or headings on completely and marks were deducted for not doing this so as to differentiate them from students who did. Few students stated the obvious facts regarding stepped and level premiums. Many discussed lapse rates rather than the impact of lapses on cashflow profits. The concept of cashflow profit does not seem to be well understood which is a concern. Perhaps this is not explicitly taught in the syllabus. Many discussions involved Policy Liabilities and Capital reserving.

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

55 candidates enrolled this semester. Of these, 0 withdrew and 3 did not present, leaving 52 sitting the exam.

It is proposed that 18 candidates be awarded a pass, which implies a pass rate of 35%. Table 1 shows the historical pass rates for this subject:

Table 1 – Course Experience

SEMESTER	SAT	PASSED	PASS RATE
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%
Semester 2 2011	41	6	15%
Semester 1 2011	41	16	39%

The 35% pass rate for this exam is slightly higher than the 33% pass rate for the previous exam (Semester 2 2016) and the historical average of 32%.

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. While these candidates tend to perform poorly on the exam, in some cases Forum participation marks can mean the difference between passing and failing.

The performance in the Long Answer Questions, although better than the previous semester overall, 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 judgement.
- 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 judgement in other parts.
- Not reading and/or answering the question correctly – for example discussing the approach to setting lapse and Event stress margins when only random and future stress margins were asked for.
- 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.

Many candidates failed to demonstrate an understanding of:

- How to take into account loss recognition when using the accumulation method to determine the policy liability.
- The entire derivation of the Insurance Risk Charge (IRC), with most candidates able to start and progress the calculation, but very few able to nearly complete it.
- The operation and valuation of participating business, including how these differ to non-participating business and considerations required by the Appointed Actuary.

The presentation of reasonable arguments to back up conclusions and apply complex judgement 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
Total Marks Available	58.0	58.0			
Strong Pass	41.0	41.0	70.7%	4	8%
Pass	32.0	32.0	55.2%	18	35%
Slightly Below Standard	28.8	28.8	49.7%	6	12%
Below Standard	24.5	24.5	42.2%	10	19%
Weak	20.0	20.0	34.5%	4	8%
Showed Little Knowledge	1.0	1.0	1.7%	10	19%
Did Not Attempt	0.0	0.0	0.0%	0	0%
Maximum Mark	45.5	45.5			
Average Mark	29.0	29.0			
Standard Deviation	9.2	9.2			
Co-efficient of Variation	0.32	0.32			

Question 1 focused on a life company that has recently entered the group risk market in Australia, winning a large employee scheme. Candidates were asked to recommend an approach to perform the policy liability valuation for the group scheme, recommend claim assumptions in light of recent experience and perform the policy liability calculations using the accumulation method (allowing for loss recognition considerations).

Candidates were also required to explore the rationale of having two separate Related Product Groups (RPGs), and provide recommendations (to be included in the Financial Condition Report) on improving the profitability of the group scheme and the company's group tender process.

This question was generally answered fairly well, with a pass rate of 43%. Most candidates showed a good understanding of the basic concepts assessed in this question. Those who obtained an A grade demonstrated further understanding and attention to detail, particularly in the sections involving complex judgement.

The majority of candidates recommended an accumulation approach to calculate the policy liability in **part a)i)**, with better candidates:

- Describing their reasons, using language appropriate for addressing a CFO.
- Including considerations as to why this approach would not produce a materially different result compared to the projection approach.

Only around half the candidates calculated the policy liability at commencement (immediately after the premium was received) in **part a)ii)** correctly, with the following common mistakes:

- Including claims reserves, such as for Claims in the Course of Payment (CICP) and/or claims that have been Incurred But Not Reported (IBNR), despite the scheme just commencing.
- Not splitting the acquisition costs between Lump Sum and Group Salary Continuance (GSC) as per the question.

In **part b)i)** most candidates were able to suggest a reasonable incidence assumption to use given the information, with better candidates justifying their choice (and why they didn't suggest a higher/lower assumption). Some candidates did not comment on the termination assumption.

Many candidates were able to calculate the expected future cash outflows less inflows in **part b)ii)**, however some candidates made mistakes including:

- Performing the calculation over the wrong term (typically one or three years, rather than two).
- Making arithmetic errors.

The calculation of the policy liability for **part b)iii)** was poorly done. Many candidates failed to recognise that their answer to **part b)ii)** meant the GSC RPG was in loss recognition, so that:

- Acquisition costs could no longer be deferred.
- A loss recognition or premium deficiency reserve was needed.

In addition to these omissions, other common mistakes involved:

- If including a loss recognition or premium deficiency reserve, not including a CICP reserve for past claims already in payment.
- Including an Unearned Premium Reserve, despite the valuation date being at the end of the year.
- If including a Deferred Acquisition Cost component, having this as a positive rather than a negative item in the calculation of the policy liability.
- Not incorporating claim handling expenses into the calculation.

Calculating profit in **part c)i)** was also poorly handled, with common mistakes including:

- Using the answer to **part a)ii)** to determine the change in the policy liability over the year (when part a)ii) was determined immediately after premiums were paid).
- Not incorporating the actual profit from the "Other RPGs" as provided in the question.

Part c)ii) was fairly well handled, with most candidates able to communicate why two separate RPGs are appropriate. Better candidates also provided an argument why a single RPG could be considered.

Most candidates provided recommendations to improve profitability in **part d)i)**, with better candidates focusing on addressing the key drivers of the poor experience over the past year (namely poor GSC claims experience) rather than generic recommendations (such as reducing expenses or investing in higher yielding assets). Few candidates raised reinsurance here.

Similarly, for **part d)ii)** while candidates generally provided recommendations related to the group tender process, only a few candidates focused on key issues raised throughout the question (such as including a clause that allows for the premium to be increased if experience deteriorates by more than a specified amount between the tender submission and the scheme start date or limiting the premium rate guarantee period). Weaker candidates highlighted generic recommendations (such as spending more time on the tender process or increasing premiums charged for GSC business).

Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	66.0	66.0			
Strong Pass	45.0	45.0	68.2%	7	13%
Pass	37.0	37.0	56.1%	16	31%
Slightly Below Standard	33.3	33.3	50.5%	8	15%
Below Standard	28.0	28.0	42.4%	8	15%
Weak	20.0	20.0	30.3%	7	13%
Showed Little Knowledge	1.0	1.0	1.5%	6	12%
Did Not Attempt	0.0	0.0	0.0%	0	0%
Maximum Mark	53.0	53.0			
Average Mark	33.8	33.8			
Standard Deviation	10.8	10.8			
Co-efficient of Variation	0.32	0.32			

Question 2 focused on a foreign-owned life company with only investment-linked business (open to new members) which is considering entering the retail YRT market in Australia (with some reinsurance support). Candidates were asked to outline to the Chief Financial and Operating Officer of the life company why the proposed stress margins for the Insurance Risk Charge (IRC) are higher than other companies of a similar scale to the anticipated business volumes, and provide considerations of whether diversification benefits arise between asset risks for the investment-linked business and insurance risks for the YRT business when calculating the capital requirements.

Candidates were then required to calculate the IRC (in steps) using the provided template of best estimate cash flows, and communicate to the parent company a potential disadvantage from a capital perspective of increasing the level of reinsurance with the existing reinsurer, as well as providing a mitigant to this.

This question was generally answered reasonably well, with a pass rate of 44%. For the quantitative component, most candidates showed a good understanding of the initial calculation of the IRC (with the individual stresses), but struggled with combining the stresses and completing the calculation through (despite the textbook having an example of the calculation). With the qualitative components of the question, candidates typically either performed consistently well or consistently poorly.

Almost all candidates gave valid reasons in **part a)** on why the proposed random and future stress margins may be higher than industry peers. Better candidates:

- Provided multiple reasons for each stress, rather than a single reason.
- Provided reasons that were specific and most relevant to the scenario in the question, rather than a generic list of reasons.
- Used language appropriate for the intended audience.

Some candidates unnecessarily described what the random and future stresses were (e.g. copying directly from the prudential standard) or included discussion of other stresses (such as the event and lapse stresses).

Part b) was intended to be relatively straight-forward, however:

- Several candidates showed serious misunderstanding by stating that the insurance business could be held within the same statutory fund as the investment-linked business (which is not allowed under the Life Insurance Act 1995).
- Some candidates unnecessarily described the reasons why diversification is allowed for under the prudential standards (often using phrases from the textbook verbatim).

Better candidates stated the insurance business would be in a separate statutory fund and clarified exactly how diversification is allowed for.

For **part c)**, most candidates did very well in parts which involved straight forward application of formulae, namely:

- **Part c)i)** – regulatory adjustment to net assets.
- **Part c)iii)** – diversification factor.

However, some candidates either didn't attempt these parts or got the formula/computation wrong.

Most candidates made some progress in determining the individual stresses in part c)ii), but many made mistakes including:

- Not applying the stresses to the IBNR correctly.
- Not applying the event stress appropriately.
- Not applying the stresses for the correct term.

Part **c)iv)** was poorly attempted. Most candidates attempted to apply the expense and lapse stresses, however there were often mistakes in the application. Very few got further than this. Common errors included:

- Not applying the expense and lapse stresses for the correct term.
- Not correctly applying the diversified random, future and event stresses altogether for the appropriate terms.
- Not taking into account 12 months of stressed cash flows.
- Taking the stressed adjusted policy liability at the valuation date, rather than one year later.

Part d) was well done, with most candidates who attempted this question correctly identifying a capital issue with increasing the reinsurance level, and appropriate mitigant(s). Better candidates used language and a format appropriate to the intended audience (avoiding jargon), and outlined (rather than just identifying) the mitigant(s).

Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	56.0	56.0			
Strong Pass	40.0	40.0	71.4%	5	10%
Pass	34.0	34.0	60.7%	14	27%
Slightly Below Standard	30.6	30.6	54.6%	3	6%
Below Standard	26.5	26.5	47.3%	13	25%
Weak	19.0	19.0	33.9%	9	17%
Showed Little Knowledge	1.0	1.0	1.8%	7	13%
Did Not Attempt	0.0	0.0	0.0%	1	2%
Maximum Mark	44.0	44.0			
Average Mark	28.3	28.3			
Standard Deviation	10.2	10.2			
Co-efficient of Variation	0.36	0.36			

Question 3 focused on a life company with a closed book of participating endowment business and an open portfolio of YRT business, where reversionary bonuses for the participating portfolio have been stable for many years. Following a significant increase in interest rates over the past quarter, candidates were asked to describe the expected impact this will have on the upcoming policy liability valuation for the participating business and the next steps required to address the asset-liability mismatch now present.

Candidates were then asked to provide considerations in setting a surrender assumption given recent experience has been significantly lower than the existing assumption, and describe the components that make up the Analysis of Profit (AOP) for the participating business, comparing and contrasting this to the YRT business. Finally, candidates were asked to describe considerations to recommend to the Appointed Actuary in light of a large expense experience loss for the participating business.

This question was answered fairly, with a pass rate of 37%, though the quality of the answers was variable – indicating that this question was a good discriminator. While many candidates got parts of the question correct, they often struggled with others. Better candidates were able to apply the principles to the situation presented in the question, rather than present generic points.

Part a)i) was generally well answered, with most candidates understanding the impact of the yield curve change on the participating policy liability components. Better candidates provided explanations that show their understanding of how each component is determined. Some candidates failed to understand that an increase in the yield curve reduces the value of the assets more than any increase in investment earnings.

Part a)ii) was also well handled, with most candidates understanding a review of the investment strategy is needed. Better candidates applied the principles to the situation in the question (e.g. specifically recommending that assets need to be rebalanced by selling long term and buying short term duration assets).

For part **b)i)**, most candidates discussed only generic considerations (such as industry experience, future trends and competition), scoring limited marks. Better candidates discussed the main issue, i.e. what the key drivers of the surrender experience could have

been in the specific situation presented in the question (e.g. past bonus declarations have been generous, more policies approaching maturity as the book is in run-off). Some candidates confused the surrender rate assumption with the surrender basis.

Part b)ii) was generally well answered. Many candidates correctly concluded the recent experience would be reflected with a surrender experience loss emerging. Some candidates did not make a conclusion, despite enough information being provided in the question to do so, while others concluded incorrectly that there would have been a surrender experience profit. Generally, if the candidate responded poorly on this part, they performed poorly on the question overall.

Part c)i) was answered poorly. Most candidates failed to identify other non-claim decrement experience besides surrender experience (i.e. paid up experience), despite a mention of the paid up basis in the question. Better candidates:

- Highlighted that more deaths than expected will result in experience losses, and why this was the case.
- Identified that there is no investment experience profit/loss for the participating product.

Some answers were too brief. A few candidates misinterpreted the question and tried to link how the surrender experience loss impacts each of the AOP items.

Part c)ii) was also poorly attempted. Several candidates failed to state the direction of the impact for each item or how they differed between Yearly Renewable Term (YRT) products and the participating endowment. Some students only explained the AOP items for YRT and did not compare this directly to Par products as required by the question. Better candidates explained the reason for differences, i.e.:

- The death strain for YRT products are higher due to the higher sum at risk compared to the policy liability.
- Lapses on YRT generally have an opposite impact to the surrenders on the endowment in this scenario, due to the high acquisition costs.

For **part d)** only a couple of candidates managed to identify the role of Appointed Actuary in the expense allocation. Better candidates were able to identify and explain the potential drivers of expense experience loss, as well as the implications and equity considerations for the participating business.

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%

1.3. Pass Rates

95 candidates enrolled this semester. Of these, 2 withdrew and 1 did not present, leaving 92 sitting the exam.

It is proposed that 23 candidates be awarded a pass, which implies a pass rate of 25%. Table 1 shows the historical pass rates for this subject:

Table 1 – Course Experience

SEMESTER	SAT	PASSED	PASS RATE
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%
Semester 2 2011	78	18	23%
Semester 1 2011	76	24	33%

The 25% pass rate for this exam is higher than the 23% pass rate of the previous exam and similar to the historical average of 27%. Candidates seemed to have good course knowledge with the passing candidates able to provide reasonable justifications to support their arguments.

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 – lack of time was potentially part of the reason for this. Only a handful of candidates appeared strong across all areas of assessment.

Despite a shorter exam than in previous semesters candidates continued to struggle with time. 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. Practicing to complete past papers under exam conditions in under the time required is still considered to be one of the more effective methods for improving time management.

Other areas of the exam where candidates could improve on their performance include:-

- Answering the question. Not answering the question asked can result in responses that only cover a fraction of the information required – for example, many candidates didn't discuss "why" the feature of claims experience impacted "each" model in Question 1 despite being 38% of the overall mark for this question.
- Demonstrating understanding. Question 1 was a good example where candidates often didn't demonstrate their understanding effectively, albeit, not at the level required of a passing candidate. Many candidates gave answers that were too simplistic to obtain marks, i.e. simply stating "the ICD model is higher because the incurred cost is higher" doesn't explain "why" the result is higher. A better answer would be "the ICD model is higher because the method is multiplicative on the incurred cost to date which is higher".
- Justifications for reasoning. The presentation of reasonable arguments to back up conclusions and apply complex judgement was missing in many cases, with the quality of explanations often weak for such candidates. In this paper, there were several judgement questions directed to the CFO with many candidates presenting responses that were significantly below the quality that would be communicated to an individual of that level. Common examples included complicated formulae, lack of structure and/or contradicting advice.

Despite being considered by the scrutineers as one of the easier and less time-consuming questions in this paper, Question 1 resulted in being one of the more challenging and time-consuming questions 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, brevity of answers, poor structure or not answering the question.

2.1 Exam Question by Question Analysis

Question 1

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	60.0	60.0			
Strong Pass (A)	35.5	35.5	59.2%	6	6%
Pass (B)	27.0	27.0	45.0%	18	19%
Slightly Below Standard (C)	24.3	24.3	40.5%	5	5%
Below Standard (D)	16.0	16.0	26.7%	26	28%
Weak (E)	9.5	9.5	15.8%	25	27%
Showed Little Knowledge (F)	1.0	1.0	1.7%	12	13%
Did Not Attempt (X)	0.0	0.0	0.0%	1	1%
Maximum Mark	48.0	48.0			
Average Mark	19.7	19.7			
Standard Deviation	9.5	9.5			
Co-efficient of Variation	0.48	0.48			

Question 1 comprised of two parts. Part a) examined whether candidates had a thorough understanding of the basic valuation methodologies used in the Australian market, and how these would respond to changes in the underlying experience. Part b) examined the candidate's understanding of the features of different lines of business, by comparing the relative size of the outstanding claims liability to the premium liability.

Part a) comprised of 6 scenarios with each scenario requiring candidates to identify the feature of experience that caused a specific outcome, discuss why this feature did or did not impact each model and identify a business reason for the feature to occur.

Commentary on the performance on each scenario are discussed below:-

- Scenario 1: Candidates were generally able to identify the increase in payments and the increase in finalisations. Some candidates were able to further identify the reduction in case estimates, but almost none commented on the incurred remaining the same as expected, which resulted in few candidates scoring full marks on the features part of this question.
- Scenario 2: Most candidates were able to identify the increase in case estimates and were able to identify the driver being due to a change in case estimate setting practices.
- Scenario 3: Candidates performed well in this part with many stating that the changes were due to a cat event occurring. Marks were only awarded where candidates adequately explained that it was due to a recent occurring event which only increased case estimates but not payments.
- Scenario 4: Most candidates got this part incorrect despite it appearing straightforward. Most candidates commented that the loss ratio for the BF method had changed, despite the question clearly stating that modelling assumptions were unchanged. For the candidates who managed to identify an increase in exposure leading to the change, many incorrectly stated that it was due to growth in the book, without realizing that this would have had flow-on impacts onto the claim frequency and total incurred cost.

- Scenario 5: Few candidates were able to identify the exact features and business reason required for this scenario, and many were awarded with partial marks. A number of candidates showed poor understanding of the PPCF method, and stated that a lower estimate for PPCF would be driven by fewer finalisations.
- Scenario 6: Candidates were generally able to score some marks in this scenario, and it did not seem difficult to identify the features and name an appropriate business reason.

Comments on each sub-part are discussed below:-

- Features of experience: Candidates generally were able to name some features within each scenario, but may not have mentioned all of the relevant ones to score full marks. Candidates that scored low marks for the features generally did not understand the underlying models and how they work. The average mark for this part was 1.3/3.5.
- Model impacts: This part was poorly attempted by Candidates. The view was that this was either misinterpreted by candidates or took a lot of effort to complete due to the tedious nature of having to go through each method in each scenario.
- Many candidates were confused about holding assumptions constant, and discussed the impact of the feature changes on the assumptions (which scored them little to no marks) or did not go into detail and explain explicitly the impact on each model (i.e. very few candidates would say explicitly that claim payments are multiplied by development factors to get the ultimate in the PCL method). The average mark for this part was 2.7/11.5.
- Business reasons: Good candidates were able to identify business reasons that would fit most of the scenarios. Partial marks were awarded where poor explanations were provided or if the reasoning did not fit the feature of experience. Some candidates contradicted themselves and so were awarded no marks. The average mark for this part was 1.6/6.0.

Part b) was considered to be relatively easy with the vast majority of candidates able to score reasonable marks. In some instances, candidates incorrectly interpreted the ratio OCL/PL as PL/OCL. The following summarises each of the portfolios:-

- Public liability and workers compensation: more than half of the candidates scored full marks on these two portfolios. Those who did not either did not identify the portfolios correctly, or they did not demonstrate that they understood the nature of these portfolios (i.e. long tail, with OCL being much larger than PL). Additionally, some did not mention the runoff point relating to Workers compensation.
- Extended warranty: half of the candidates scored full marks on this, with the critical point being that they were able to identify that the OCL should be zero because the warranty period does not start until the original warranty expires. Candidates who did not recognize the zero OCL were generally not awarded any marks.
- Motor: about 30% of candidates scored full marks. Some candidates did not know that Motor insurance does not include the long tail component in Australia.
- Accidental Phone damage insurance: Few candidates scored full marks on this, with many being tripped up by the monthly renewable point.
- Gap insurance: Not many candidates scored full marks on this portfolio. Many candidates did not know about gap insurance, however, some were still able to score marks by going to first principles and making some relevant statements based on the information provided in the question. Many candidates were confused and incorrectly referred to this class as being "long tail".

The average mark for this part was 4.2/9.0.

Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	60.0	60.0			
Strong Pass (A)	38.0	38.0	63.3%	7	8%
Pass (B)	30.0	30.0	50.0%	25	27%
Slightly Below Standard (C)	27.0	27.0	45.0%	11	12%
Below Standard (D)	20.0	20.0	33.3%	22	24%
Weak (E)	16.0	16.0	26.7%	16	17%
Showed Little Knowledge (F)	1.0	1.0	1.7%	11	12%
Did Not Attempt (X)	0.0	0.0	0.0%	1	1%
Maximum Mark	43.3	43.3			
Average Mark	25.2	25.2			
Standard Deviation	8.8	8.8			
Co-efficient of Variation	0.35	0.35			

Question 2 examined premium revenue recognition and reinsurance and aimed to test standard methodologies. Part a) covered premium revenue recognition for a mixed short tail portfolio, part b) covered various reinsurance treaty arrangements and part c) was a response to the CFO regarding the necessity of reinsurance. This question was not answered well by most candidates with many struggling to carry out standard calculations for incidence of risk and the unearned premium reserve.

The following summarises the components in part a):-

- **Part ai):** Earning pattern. This was generally well answered, with most candidates able to perform standard calculations, taking into account issues highlighted by the data. Common errors included rounding to the nearest month when calculating delay and using claims numbers instead of incurred amounts as basis of risk. Easy marks were lost for candidates that did not turn their attention to each product's incidence of risk and thus weren't able to justify their selections. Few candidates thought to justify smoothing of later earning periods. The average mark for this part was 2.6/6.0.
- **Part aii):** Unearned premium reserve. Many candidates did not attempt this question as they either did not know how to calculate unearned premium or they had spent too much time on ai). Common errors included ignoring policies incepted after the valuation date and rounding up or down in calculating the remaining exposure period. Few candidates allowed for incomplete months and provided sufficient explanation. The average mark for this part was 2.3/6.0.
- **Part aiii):** Financial accounts – Memo. This was generally well attempted as most candidates understood the relationship between earned premium and the unearned premium reserve and how any changes would directly impact the bottom line. Candidates did consider the Liability Adequacy Test although very few could articulate the likely impact. No candidates were awarded marks for considering the impact on the OCL and, disappointingly, only one candidate was awarded full marks for having a correct memo format. The average mark for this part was 1.5/5.0 despite the memo format being worth 1 mark.

- **Part aiv):** Response. This was generally not answered well as the majority of candidates were not able to provide reasons other than regulatory/accounting requirements with less than half correctly identifying the requirement by the standards. Many candidates addressed smoothing of profits in general as opposed to the impact of changing the earning pattern. Few candidates identified that underlying profitability was not the issue rather the recognition of it and fewer considered if the impact from the change in earning pattern was material. The average mark for this part was 0.5/3.0.

In part b) candidates generally performed well with many scoring close to full marks. Candidates that described the operation of reinsurance on a case by case basis as opposed to a single formula tended to avoid making simple mistakes. Several candidates struggled to explain how surplus operates and the rationale for its inclusion in a reinsurance program and many didn't specify the measure for the 110% retention limit. It was felt that few candidates read the question clearly with many copying solutions from previous exams which were not relevant to this question. The average mark for this part was 4.0/7.0.

In part c) almost all candidates identified that it was misleading to simply assess reinsurance performance against recent experience. Good answers considered requirements such as the Board's risk appetite as well as ancillary benefits such as access to reinsurer's expertise. No candidates were able to identify that reinsurance potentially helps market branding and only a few identified its benefit of providing opportunity to grow or take on new risks. The average mark for this part was 1.7/3.

Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	60.0	60.0			
Strong Pass (A)	38.0	38.0	63.3%	5	5%
Pass (B)	29.0	29.0	48.3%	18	19%
Slightly Below Standard (C)	26.1	26.1	43.5%	7	8%
Below Standard (D)	18.0	18.0	30.0%	38	41%
Weak (E)	12.0	12.0	20.0%	14	15%
Showed Little Knowledge (F)	1.0	1.0	1.7%	10	11%
Did Not Attempt (X)	0.0	0.0	0.0%	1	1%
Maximum Mark	46.0	46.0			
Average Mark	23.0	23.0			
Standard Deviation	8.9	8.9			
Co-efficient of Variation	0.39	0.39			

Question 3 examined the concept of the deferral and release of profit as a result of the elements in the reserving process, the principles of insurability and the LAT.

Candidates that scored slightly below the pass mark in general demonstrated some understanding in the easier parts of the question (i.e. part b and part cii), but did not score well in the more challenging sub-parts of the question (i.e. part a and part ci). Candidates may have the impression that the reserves and the emergence of profits are driven by a complex array of subjective actuarial assumptions, and failed to appreciate the intuitions behind the deferral and release of profit as a result of the elements in the reserving process. Candidates slightly above the pass mark in general showed some understanding

in either a) or ci) and performed reasonably well in the easier parts of the question.

The following summarises the components to each sub-part:-

- **Part ai):** About a third of candidates correctly identified that the information provided by the analyst needed to be split for exposure relating to claims incurred prior to 30 June 2016. Many candidates listed information that would be needed in general to calculate a movement in outstanding claims provisions without consideration for the details provided in the question. For example, one candidate mentioned "unwind of discount" even though the question specifically stated that inflation and discounting are not allowed for in the provisions. The average mark for this part was 0.7/2.0.
- **Part aii):** Most candidates found this question challenging as the policies were two years in length. Only one candidate scored full marks. The average mark for this part was 0.4/4.0.
- **Part aiii):** This question required candidates to identify the drivers of the reduction in the prior year claims and premium provision over the year. This part of the question was answered poorly. About half of the candidates correctly identified better than expected experience as a driver for the reduction in the outstanding claims provision. However, most missed the other points. A common mistake was to attribute the benign catastrophe experience in the 2016/17 year to the reduction in outstanding claim liabilities rather than premium liabilities. Few candidates identified the release of risk margin and claim handling expense loadings as payments are made. The average mark for this part was 0.9/5.0.
- **Part bi):** This question was answered reasonably well in general. Most candidates showed some understanding of the disadvantages of the 5 year policy to each stakeholder and scored at least partial marks. The average mark for this part was 1.5/3.0.
- **Part bii):** This question required candidates to compare the insurability of the 5-year policy to the 2 year policy. Most showed an understanding that the 5-year policy was less insurable in terms of affordability given the high upfront premium. Fewer candidates identified assessable cost as a reason for the 5 year policy being less insurable. The average mark for this part was 1.6/3.0.
- **Part biii):** This question required candidates to recognise the general challenge in pricing a very long term insurance contract with substantial concentration risk. Most candidates correctly recommended that the insurer should not offer the product with reasonable justification. The average mark for this part was 1.6/2.0.
- **Part ci):** Only a few candidates correctly recommended that the balance sheet figures (UPR and DAC) and premium liability assumptions cannot be manipulated to prevent the insurer from failing the LAT. Some candidates even suggested to modify the numbers simply to satisfy the LAT. Candidates should recognise inappropriate responses to such requests in real-life could result in a breach of profession conduct. A common answer provided was to write down Deferred Acquisition Costs to Zero and set up an unexpired risk reserve. No marks were awarded for this response as it does not address the CFO's concern on preventing the insurer from failing the LAT. The average mark for this part was 0.4/2.0.
- **Part cii):** Candidates answered this question reasonably well. Those that did not score well appeared to either run out of time or did not provide enough reasoning on the strategies that can be implemented. The most relevant responses should address future business profitability and risk proxied by the LAT, instead of the modification of accounting and actuarial assumptions. The average mark for this part was 4.8/9.0.

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

79 candidates enrolled this semester. Of these, 3 withdrew and 3 did not present for the exam, leaving 73 sitting the exam.

It is proposed that 33 candidates be awarded a pass, which implies a pass rate of 45%. Table 1 shows the historical pass rates for this subject:

Table 1 – Course Experience

SEMESTER	SAT	PASSED	PASS RATE
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%
Semester 2 2012	69	26	38%
Semester 1 2012	71	27	38%

The 45% pass rate for this exam is higher than recent semesters and the historical average. Candidates seemed to have good course understanding and ability to apply judgment to the situations presented. The majority of candidates seemed to be able to complete the exam in the time provided.

The exam was deliberately designed to be completed in the time allocated allowing candidates to demonstrate knowledge of the course. Anecdotal feedback has supported this and may have been a factor in the higher pass rate.

2. Assessment

2.1. Overall Performance

The raw marks for this semester were higher compared to last and recent semesters. This potentially reflected a slightly easier standard of exam which was intended for candidates to be able to be completed in the allocated time. This was deliberate to allow candidates greater ability to differentiate on providing complete answers without under time pressure. In setting the exam we tried to avoid questions that based on the difficulty would see very small numbers of candidates achieve marks and didn't effectively differentiate.

A learning from this approach has been that encouraging markers to be generous with marks may not have been necessary for this exam. On questions that required students to apply simple judgement an observation through reviewing the borderline candidates is that markers were generous with respect to the bookwork element and could have been more discerning in awarding marks based on the judgement element of this question. For example the question requiring candidates to describe a pricing methodology and discuss its relevance to the circumstances given on review was marked such that candidates who just described the process often performed strongly.

Using the standard deviation of marks as a measure of differentiation this exam had greater variability than last semester. Question 1, 2, and 3 standard deviations were 11.1, 9.5 and 11.0 compared to the prior exam of 8.6, 7.1 & 8.8. This was despite the raw average marks being fairly comparable prior to scaling the prior exam. In the prior exam one question was considered relatively easy.

- The highest mark was 170, which was higher than last semester's 139.
- Online participation mark average of 8.0/10 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. Q2 was the best answered question with 54% of candidates passing.
- 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 Candidate s	Proportion of Candidates
Total Marks Available	60.0	60.0			
Strong Pass	54.0	54.0	90.0%	3	4%
Pass	44.0	44.0	73.3%	28	37%
Slightly Below Standard	39.6	39.6	66.0%	17	22%
Below Standard	33.0	33.0	55.0%	15	20%
Weak	25.0	25.0	41.7%	9	12%
Showed Little Knowledge	1.0	1.0	1.7%	1	1%
Did Not Attempt	0.0	0.0	0.0%	3	4%
Maximum Mark	55.0	55.0			
Average Mark	40.2	40.2			
Standard Deviation	11.1	11.1			
Co-efficient of Variation	0.28	0.28			

Candidates performed reasonably well on this question, with a pass rate of 41%.

The question focused on a supermarket that had commenced selling car insurance and asked candidates to discuss pricing implications to a non-technical audience and to discuss how big data could be used within parts of the insurance operation.

- a)** Most candidates answered this quite well. Straightforward textbook question. Only a handful of candidates mentioned that expenses might increase initially from initial setup cost of big data infrastructure.
- b)** Most candidates answered this quite well discussing how data could be used in different parts of the organisation.
- c)** the question asked candidates to discuss various pricing techniques. Some candidates didn't relate the pricing techniques back to how it could or could not be used with big data. This was disappointing given that this is clearly stated in the question and would be considered core content for the course.
- d)** the question was calculation based with some basic statistical approaches. Most candidates performed the one way and two-way analysis effectively. Some candidates summed up the customer numbers as opposed to counting them which is an area to be careful. Not many candidates completed the credibility calculation.
- e)** most candidates answered this brief question on how to improve a pricing model quite well.

Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidate s	Proportion of Candidates
Total Marks Available	60.0	60.0			
Strong Pass	42.0	42.0	70.0%	8	11%
Pass	32.0	32.0	53.3%	33	43%
Slightly Below Standard	28.8	28.8	48.0%	12	16%
Below Standard	18.0	18.0	30.0%	17	22%
Weak	12.0	12.0	20.0%	2	3%
Showed Little Knowledge	1.0	1.0	1.7%	1	1%
Did Not Attempt	0.0	0.0	0.0%	3	4%
Maximum Mark	45.0	45.0			
Average Mark	31.2	31.2			
Standard Deviation	9.5	9.5			
Co-efficient of Variation	0.30	0.30			

Candidates performed reasonably well on this question, with a pass rate of 54%.

The question focused on the merger of two insurance companies and asked candidates to discuss the reinsurance and capital implications. It also asked them to discuss catastrophe loss modelling. Overall the question was well answered with very strong results.

- a)** Straight forward statistical questions which were differentiating of candidates who knew this content.
- b)** Straight forward statistical questions which were differentiating of candidates who knew this content.
- c)** Straight forward calculation question of reinsurance premiums and results for the business. Generally, well answered.
- d)** knowledge and simple judgement question asking candidates to discuss the process of updating a simulation model that was well answered.
- e)** question discussing the implications of the merger on reinsurance programs. Candidates showed a sound understanding however this question required complex judgement and was a key differentiator of responses.

Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidate s	Proportion of Candidates
Total Marks Available	60.0	60.0			
Strong Pass	51.3	51.3	85.4%	4	5%
Pass	46.0	46.0	76.7%	26	34%
Slightly Below Standard	41.4	41.4	69.0%	25	33%
Below Standard	30.0	30.0	50.0%	13	17%
Weak	18.0	18.0	30.0%	4	5%
Showed Little Knowledge	1.0	1.0	1.7%	1	1%
Did Not Attempt	0.0	0.0	0.0%	3	4%
Maximum Mark	53.0	53.0			
Average Mark	41.1	41.1			
Standard Deviation	11.0	11.0			
Co-efficient of Variation	0.27	0.27			

Candidates performed reasonably well on this question, with a pass rate of 39%.

Overall Q3 was well answered with a mean of 20-21 (out of 30).

The question asked candidates to consider an online only insurance company and the implications this would create for an operating model. The question included a section asking candidates to draft a section of the FCR (part b).

Candidates generally did well in all subsections except part b). As a result, part b) has been the main differentiator between the candidates. When comparing candidates who passed the question to those below the pass mark for the question, a clear difference in the performance for this part could be seen. If the other parts were answered strongly, candidates that passed demonstrated a stronger understanding of the requirements of a risk analysis in the FCR. This was especially seen in being able to state the materiality of the risk for the company specifics given in the question and being able to provide monitoring strategies.

a) some candidates interpreted the question as “apart from expenses, what else can contribute to the low pricing”. This interpretation was accepted in marking. However, the essence of identifying the main sources of expenses, and understanding the drivers and the levers to influence premiums, was on a whole missed. Nevertheless, candidates were able to pick up strong marks from identifying the key points in each of the three sections of part a).

b) most candidates identified two risks and suggested management plans, but struggled in showing how material the risks were and how to monitor the risks. On a whole, candidates that attempted to address risks related to technology were not able to articulate the materiality and monitoring of these operation risks. Considering the question asked for a draft of the FCR section on risks, the full 1 mark was not given for style and professionalism if the majority of the response was not structured and was just a list of points. Likewise addressing sections of the FCR that were not focused on risks were not given full marks.

c) candidates were generally able to pick up the obvious points to receive high marks. Some candidates suggested changing the strategy to continue with the faster expected growth and push for even higher market share. Given the particulars of the questions this was not accepted as a valid response.

For part **e)**, most people were able to calculate the PCA ratios correctly, but some failed to make comments on the results in ii) and iii). Given that the correct solution resulted in capital under the regulatory minimum, it was expected that candidates would provide some commentary to this effect. A few candidates assumed capital base remained the same throughout the projection period, without recognising erosion due to operating losses, which was a serious mistake and reflected a lack of understanding of the relationship of profit and capital. The other serious mistake was adding both profit and investment income made in the period to the opening capital base to derive the closing capital, which double counted investment income. Some candidates assumed that no dividends/tax paid before adding the profit to the opening capital. These candidates clearly understood the linkage between profits and capitals. Finally, several candidates converted earned premium to written premium to project premium growth which was pleasing.

COURSE 5B INVESTMENT MANAGEMENT AND FINANCE

1. Summary

1.1. Course Overview

The aim of the 5B Investment Management and Finance Course is to provide the knowledge, skills and judgement necessary to understand the pricing and modelling frameworks for derivative securities, including exotic options, as well as to tackle a range of practical financial problems related to such pricing / modeling frameworks. The course also equips candidates with an understanding of different derivative types, capital market theories and aspects of quantitative risk management. The importance of professionalism is also emphasised in the course.

Assessment

The assessment model is broken down into two parts:

Forum Participation 10%

Long Answer Question Exam 90%

1.2. Pass Rates

36 candidates enrolled this semester. Of these, 2 withdrew and 1 was absent for the exam, leaving 33 sitting the exam.

It is proposed that 7 candidates be awarded a pass, which implies a pass rate of 21%. Table 1 shows the historical pass rates for this subject:

Table 1 – Course Experience

SEMESTER	SAT	PASSED	PASS RATE
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%

While the 21% pass rate for this exam is higher than the 12% pass rate for the C5B examination in 2016 Semester 1, the proposed pass rate is generally lower than the historical average pass rate of previous C5B examinations. Most candidates seemed to have struggled to

explain course knowledge under examination conditions, and in addition unable to use their knowledge in a way that is relevant to the question.

C5B is now offered, without students having the option to complete the C1 Investment course first, which provides a foundation for C5B (and C5A); this may have resulted in candidates having weaker general investment knowledge than candidates in previous years. In contrast to most past C5B examinations, the 2017 C5B examination has comprehensive coverage of six units of the C5B syllabus, which may have surprised candidates who paid less attention to areas not tested by previous examinations, e.g. Unit 6 of the course. For example, almost no candidate in the 2017 C5B examination knew what "historical simulation" referred to, despite simulation and risk management techniques being covered extensively in Unit 6 of the course syllabus.

In addition, unlike styles of the previous C5B examinations, all three questions in 2017 C5B examination contain a balanced assessment of theory, computation and business judgement. The majority of the candidates struggled with the mathematical and financial theories of derivatives, their applications to practical computation, and finally were unable to "connect the dots" to convert the theory and computation into any form of meaningful business discussions. It is very evident from the quality of the candidate responses that most of the candidates do not have sufficient practical exposure to the use and management of financial derivatives.

2. Assessment

2.1. Overall Performance

Online forum participation was very good this semester, with every student receiving the full marks for participation.

This pool of candidates found this exam to be challenging overall. Very few students passed any of the questions on raw marks alone. It also seems that they experienced time pressure in this exam. See the following sections for the details in the performance in each question. There may have been too many calculations for most students to adequately complete in the 3 hours provided for the exam.

The raw pass mark for this exam was set at 98 (out of 200) marks; 4 candidates passed and there were 2 borderline assessments (before adjustments). After special adjustments, and considerations for the distribution of the raw marks (students found this exam difficult), the pass mark for the exam was lowered to 94.8 marks (out of 200) marks. 7 candidates passed overall. Both borderline cases were passed, considering the overall quality of their answers. One candidate, who originally on the raw mark scale were considered "high" fails, (just below the borderline assessments) were reassessed and became passes after special adjustments to the marks, as she / he demonstrated sufficient understanding of the fundamental concepts overall.

The Examiners required that, at minimum, a passing candidate must demonstrate sufficient understanding of the key concepts in all 3 questions. In other words, each candidate's final grade was decided based on a holistic assessment of their performance. Getting an E grade in any particular question by itself did not imply a candidate would automatically fail this course. However, any dangerous statements made by a candidate were noted by markers and did play an important consideration in deciding whether a candidate was considered fit to practice (a requirement for passing this exam).

It is clear from the overall performance in this exam that the students are not focusing their studies on some of the fundamental concepts in the course, which were specifically tested in this exam. Going forward, 5B students should master at least the specific concepts that follow, when preparing for the 5B exam, because these key concepts are likely to appear again in some form in future 5B exams:

- To understand the notation associated with stochastic interest rates and relationships to bond prices (see Q1 part c)). (In the opinions of the examiners, this was an extremely basic question, which many students could not answer adequately in this exam.)
- Being very familiar with the rules of stochastic calculus, and being able to perform expectation (and squared expectations/variance) mathematics for stochastic integrals (including double integrals and reversing the order of integration) (see Q1 part d))
- Have a strong understanding of delta hedging for any kind of option, and *be able to explain in words what the hedging strategy is* at some given point in time (see Q2 part e)). Being able to appreciate that most of the concepts that apply to discrete time hedging models are the same in principle when working with continuous time models. In this exam, most students were able to calculate the price or delta for the option. However, almost all of the students could not explain in words what the delta was, or how the hedging strategy for the option was formed! Understanding the hedging strategy for an option works is at least as important as knowing how to price the option.
- Being *able to explain in words* what the Greeks are for options. Surprisingly, most students how it difficult to provide an explanation for vega in Q2 part f), even though they knew how to compute it. Understanding why the greeks are important for option market makers/option writers holding portfolios of options.

2.2. Exam Question by Question Analysis

Question 1

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	60.0	60.0			
Strong Pass	27.0	27.0	45.0%	2	6%
Pass	24.0	24.0	40.0%	2	6%
Slightly Below Standard	21.6	21.6	36.0%	7	21%
Below Standard	16.0	16.0	26.7%	9	27%
Weak	12.0	12.0	20.0%	7	21%
Showed Little Knowledge	1.0	1.0	1.7%	6	18%
Did Not Attempt	0.0	0.0	0.0%	0	0%
Maximum Mark	33.3	33.3			
Average Mark	17.8	17.8			
Standard Deviation	6.1	6.1			
Co-efficient of Variation	0.34	0.34			

Candidates mostly struggled in this question, with a pass rate of 12%

Question 1 aims to test the knowledge of the candidate in interest rate models, in terms of standard mathematical derivation (in particular, relationships between interest rate model dynamics and bond price model dynamics), standard calibration methods, as well as any limitations of an interest rate model.

Most of the candidates struggled with the mathematical derivations and the detailed description of the model calibration process (both considered complex judgement). Candidates were able to state some limitations of the Vasicek interest rate model, tested in the question; but the responses tend to be mostly limited to what's written in the textbooks. It is very evident from the quality of the candidate responses that most of the candidates do not have sufficient practical exposure to the use and modelling of interest rate derivatives.

Part 1 a): This part of the question is standard book work, where the candidates were asked to explain the intuitive meanings of the parameters in the Vasicek model in plain English.

Most candidates were able to get full marks or close to full marks in this question.

Part 1 b): This part of the question is also standard book work, where the candidates were asked to perform a well-known mathematical transformation of the Vasicek model, from its stochastic differential equation (SDE) form into its analytical form with the short rate at time t as the subject. Candidates were given the hint of using the "integrating factor".

The better candidates were able to complete this mathematical transformation; however, many also failed to do so. This part of question was very useful in differentiating between the better candidates from the poor.

Part 1 c): Question 1c) is the last of the standard book work component of this question. The candidates were asked to state the fundamental mathematical relationship between stochastic processes of the zero coupon bond price and the instantaneous short rate. IN

addition, the candidates were asked to explain the relationship intuitively if the short rate process were to be constant.

About half of the students answered the question correctly, however the other half of the students seem to have attempted to answer the question by copying from textbooks the standard bond pricing formulae under the Vasicek, which is unrelated to the question. This sub-question was useful as an “acid test” to differentiate the better candidates from the poor ones.

Part 1 d): This part of the question requires some complex judgement and “connecting the dots” in terms of mathematical techniques. The candidates were asked to prove the formulae for the expectation and variance of the cumulative short rate stochastic process, and thereby derive the dynamics of the zero coupon bond price process. It also serves the purpose of testing fundamental properties of Brownian motion, e.g. the independent increment characteristic.

Overall the question was completed poorly. The better candidates were able to appreciate that proving the results for d) require the use of the relationship found in c). Many of these candidates were then able to “fudge” the derivation of expectation formula, without clearly explaining mathematical assumptions. In particular, most students failed to appreciate the need to switch the order of the integration.

Without switching the order of the integration, none of the candidates were able to derive the variance formula, despite the hint given in the question. This part fully exposes the mathematical weakness of the current pool of C5B candidates.

Part 1 e): Question 1 e) has two parts. The first part tests whether candidates understand the difference between real-world and risk-neutral processes, and their respective application. The second part requests candidates explain the calibration process of the Vasicek model described in the question.

Majority of the candidates were able to point out that a risk-neutral calibration is needed, although nobody was able to give clear reasons for the assertion (despite the question clearly stating that the purpose of the model is for pricing financial instruments). The Examiners suspect most candidates guessed the answer since the C5B course is mostly concerned with risk-neutral stochastic processes.

The second part of the question was extremely poorly answered. Almost nobody in the course knew that the most liquid instruments used for calibration of risk neutral interest rate stochastic process are the swaptions. Many candidates suggested calibration to “observed” bond prices, despite the fact such bonds do not exist in reality!

The better candidates were able to provide generic answers by stating that the sum of the squares of the modelled and observed price differences should be minimized, without explaining explicitly how the model parameters can be linked to the modelled instrument prices. The poorer candidates simply suggest OLS should be applied to minimize the difference, without even explaining the difference of what?

It is very evident from the quality of the candidate responses to this part of the question that most (if not all) of the candidates do not have sufficient practical experience in the field of interest rate derivatives, and capital markets in general!

Part 1 f): This part of the question seeks candidates to apply the results from Q1 e) (irrespective of whether they were able to derive them or not) to price a simple bond option.

The Examiners expect the better candidates to calculate the expected value and variance of the lognormal process in the question using the parameters given, and then perform a simple risk-neutral simulation to derive the bond option formula. However no candidates

did this. This again is evidence for the lack of industry experience in the pool of the candidates.

Of the limited number of candidates, who attempted this part of the question, all of them chose to seek an analytical solution (which is also possible as shown in the Marking Guide). However, instead of deriving the formula from first principles, the candidates all attempted to apply the standard Black bond option formula, without appreciating that the underlying model assumptions of the Vasicek model are not consistent with the standard log-normal Black framework.

Part 1 g): The final part of the question requires the candidates to explain the limitations of the Vasicek model and suggest potential enhancements. There are many different points and enhancements candidates can raise in order to earn full mark,

Most candidates passed this sub-question, by stating some standard textbook limitations and enhancements of the Vasicek model. One such limitation, as stated by many candidates, is the negative interest rates allowed under the Vasicek model. However, none of the candidates appreciated that since the Lehman financial crisis, interest rates in Europe and Japan have gone negative; and most practitioners no longer view negativity on a standalone basis as a limitation of the Vasicek (or similar) models. This yet again is evidence for the lack of industry experience in the pool of the candidates.

Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	60.0	60.0			
Strong Pass	34.0	34.0	56.7%	3	9%
Pass	30.0	30.0	50.0%	4	12%
Slightly Below Standard	27.0	27.0	45.0%	5	15%
Below Standard	20.0	20.0	33.3%	7	21%
Weak	14.0	14.0	23.3%	7	21%
Showed Little Knowledge	1.0	1.0	1.7%	7	21%
Did Not Attempt	0.0	0.0	0.0%	0	0%
Maximum Mark	42.0	42.0			
Average Mark	22.2	22.2			
Standard Deviation	9.3	9.3			
Co-efficient of Variation	0.42	0.42			

The pass rate for question 2 was 21%. This pass rate was lower than what the examiners expected from this group of students, because:

1. In the opinion of the examiners, most of the parts of question 2 were not designed to be difficult;
2. Students should already have previous experience with pricing in binomial trees from Part 1 of the actuarial education syllabus;
3. Approximately half of the marks were assigned to question parts on pricing options

using binomial trees, which should have been routine for students who had practiced past exams which include many binomial tree questions;

4. The material in this question is covered in both of the assigned texts for this course (Hull, and Baxter and Rennie). In particular, Hull covers how to compute theta for options in the binomial tree framework (part f)), and using control variates with binomial trees (part c)). Both Hull and Baxter and Rennie discuss pricing (part a) and b)) and hedging in the binomial tree framework (part d)).

The material examined in this question is absolutely fundamental to course 5B. This question covers the concepts of pricing and hedging options in discrete time, which are fundamental to understanding the similar concepts which apply to the more challenging continuous time option pricing models (where the continuous time pricing models depend on Ito calculus mathematics), i.e. The concepts which apply in discrete time models are in essence the same when switching over to continuous time models. But in practice, the mathematics is easier to grasp in the discrete time framework, which is why most option pricing courses start out with binomial trees to help convey the key concepts. If students do not understand how hedging of options works in a discrete time framework, then it is highly likely that they do not understand pricing and hedging models for basic options more generally.

Parts d) and e) of this question were considered by the examiners to be the most challenging parts of the question, and were designed to test the candidate's understanding of the fundamentals of delta hedging.

Part 2 a) i): This part tested whether a student was able to price a European option using binomial trees. It was considered bookwork, although it took some time to complete the tree in Excel, so 5 marks were allocated to it. Getting this part correct in terms of setting up the spread sheet calculations also made answering part b) easier.

Surprisingly, only half of the pool of candidates answered this question part well enough in order to receive the bulk of the marks. This is a troubling result, as the question is basic.

Part 2 a) ii): Students were tested on their understanding of the relationship between the binomial tree model and the continuous time pricing framework (the BS framework). This question was answered reasonably well by most students.

Part 2 b): This part asked students to price an American option in the binomial tree framework. Again, it was considered to be a fairly easy question by the examiners. This question was answered fairly well overall.

However students who did not price the option correctly still missed out on fairly easy marks by at least indicating nodes which were early exercise or knock out points for the option.

Part 2 c) i): This part tested whether students were able to see that a control variate could help improve the pricing of this option in the binomial tree framework. While there hasn't been a question like this in recent 5B exams, it could be fairly easily answered if the student studied the Hull text carefully (see the marking guide for this exam for specific details on which section of the Hull text covers the parts tested in this question).

Several students were able to score 3/3 marks for this question, and overall performance was decent from the candidate pool.

Part 2 c) ii): Students were asked to demonstrate some understanding of why the control variate variance reduction technique works for binomial trees.

Overall performance was good for this question part.

Part 2 d): This part tested the candidate's knowledge of how hedging works for options in the binomial tree framework. Specifically, it is testing the candidate's understanding of why

delta hedging works, and how we arrive at arbitrage free prices for options. It tests whether students understand what "self-financing" means in the context of option pricing. If a candidate does not understand what this question is asking, then they probably don't really understand the fundamental concept of how option prices are derived.

The material in this question is introduced in the first part of the 5B course, in both prescribed texts (Hull, and Baxter and Rennie). Therefore, the examiners do not consider this question to be particularly difficult.

Most students performed poorly in this question, with approximately 1/3 of the candidates scoring 0 marks. Only 2 out of 33 candidates scored more than 2.5 marks out of 5. No candidate was able to score the full 5 marks for this part.

Clearly many students either did not understand what this question was asking. The examiners speculate that most students brushed over the material on discrete time option pricing and spent most time focusing on other parts of the course, overlooking the details of how hedging works in the binomial framework. But the importance of the material examined in this part cannot be overstated. Understanding how hedging works is fundamental to understanding how arbitrage free option prices come about, and leads to explaining why we can price options using risk-neutral probabilities.

Part 2 e) i): This part examined the ability of the candidate to be able to explain in simple words what the hedging portfolio for an option looks like as it evolves over time. The examiners considered this question to be a good test of the candidate's practical understanding of what the hedging strategy is for an option than loosely resembles that of a put option. This question also tested the candidate's communication skills, by explicitly requiring responses to be provided without numbers alone.

This was the most poorly answered question part in all of question 2. No candidate was able to score the full 6 marks for this part. Only 3 out of 33 candidates scored more than 1 mark, and the mode was 0 marks. This result is shocking. One only needs to look at the marking guide to see what kinds of relatively straightforward answers would have been awarded marks.

Clearly several students had a good mechanical understanding of the numbers involved in pricing an option (as reflected by good performances of part a) i) and part b)), but could not explain in words what the hedging strategy was. For example, it should have been obvious that at least the strategy involved shorting the underlying stock as the stock price decreases, because the option price would be increasing in value (a mark would have been awarded for making this statement alone). Some students made nonsensical or dangerous statements, such as "buying more of the stock [implying a pre-existing long delta position] when the price rises during the life of the option", which doesn't make sense in the context of this question. These kinds of statements suggest some students have no meaningful understanding of what hedging an option physically involves.

Part 2 e) ii): Students were given the opportunity to express their understanding, in simple language, of how real-world stock return expectations do not come into play when deriving options prices.

This was not considered to be a difficult question, and somewhat open ended in how students could provide responses, so a maximum of 2 marks were assigned to it. Most students were able to score at least 0.5 marks for this part.

Part 2 f): This question part asked students to compute vega within the binomial tree framework, and to give an explanation of why vega is useful.

Most students were able to score at least partial marks for the vega calculation, but very few were able to provide an adequate verbal description of what the vega estimate is useful for. Again, as in part e), it seems many students are capable with doing option calculations, but struggle at explaining in words what their calculations mean.

Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	60.0	60.0			
Strong Pass	36.0	36.0	60.0%	0	0%
Pass	30.0	30.0	50.0%	5	15%
Slightly Below Standard	27.0	27.0	45.0%	1	3%
Below Standard	20.0	20.0	33.3%	9	27%
Weak	12.0	12.0	20.0%	11	33%
Showed Little Knowledge	1.0	1.0	1.7%	6	18%
Did Not Attempt	0.0	0.0	0.0%	1	3%
Maximum Mark	32.0	32.0			
Average Mark	18.6	18.6			
Standard Deviation	8.6	8.6			
Co-efficient of Variation	0.46	0.46			

Candidates mostly struggled in this question, with a pass rate of 15%

Question 3 aims to test the candidates' ability to apply knowledge of option theories in a practical context, where complications such as the volatility smile, bid-ask spreads, rebalancing, etc. exist. One part of the question also tests the candidates' ability to apply the Black-Scholes formula in a more practical context; while another part seeks to assess candidates' ability to perform historical simulations and quantify tail risks of a proposed derivative strategy.

Most of the candidates struggled with the mathematical computation and the interpretation of practical data, i.e. many candidates do not seem to know what market data needs to be used for the various Black-Scholes parameters in a practical context. Also, no candidates seem to know what "historical simulation" refers to, despite it being a key focus of Unit 6 of the course (which historically has not been tested)

It is very evident from the quality of the candidate responses that most of the candidates do not have sufficient practical exposure to the modelling and usage of the Black-Scholes option formulae.

Part 3 a): This part of the question is standard book work, where the candidates were asked to compute the hedge cost of the FX forward from the FX forward curve, and explain the timing of the cost.

Very few candidates were able to answer this simple question correctly. Most candidates give the textbook answer of "forwards have no upfront cost", without clearly appreciating the risk and fundamental cash flows of a forward contract. This question served as an "acid test" to differentiate the better candidates from the poorer ones.

The Examiners generally find it difficult to pass a candidate in Course 5B, if s/he does not understand what a forward is.

Part 3 b): This part of the question is also standard book work, where the candidates were asked to evaluate the hedge cost savings and risk profile of a zero cost collar, as described in the question.

Most candidates were able to achieve pass marks for this component, with only very few candidates not able to understand what a zero cost collar is. Most students however were not able to fully articulate the risk of the zero-cost collar.

Part 3 c): Question 3c) requires candidates to perform a simple computation in Excel to derive the strike of the call option in the collar, for a given put option strike.

The better candidates were able to suggest that a solving mechanism is required to solve for the call option strike using the Black-Scholes framework. However, almost nobody was able to execute the actual calculation. Very few candidates were able to use the correct implied volatility value for the put option from the market implied volatility surface, while nobody noted the inter-dependency between strike value, moneyness, and implied volatility. In particular, not a single candidate suggested interpolation of the implied volatility surface for the call option strike. These all reinforce The Examiners' view that the pool of candidates lack practical experience in the capital market /financial industry.

It is also noted that the calculation here may be too time-consuming for candidates, who are not seasoned in derivative modelling in Excel. The Examiners will seek to simplify future computation questions in examinations.

Part 3 d): Question 3d) requires the candidates to explain the asymmetric nature of the call and put strikes with respect to the spot FX price. This requires some industry experience and complex judgement.

Most candidates appear to lack the necessary industry experience and were not able to link the asymmetric option strikes with the practical considerations of steepness of the forward FX curve, the volatility smile and the bid-ask spreads. Some of the better candidates were able to partially touch on the forward curve steepness by referring to the interest rate differentials between the two risk free rates.

Part 3 e): This part of the question asks candidates to perform an historical simulation to assess the likelihood of payoff and tail risks associated with the simple FX forward and FX zero cost collar strategies respectively.

Not a single candidate appears to understand what "historical simulation" means, despite it being a key focus of Unit 6 of the C5B course, which had historically rarely been examined. The better candidates were able to approximate the required calculation using parametric methods.

It is also postulated that many candidates may have run out of time by the time they reached this part of the examination.

Part 3 f): Part f) requests candidates state the limitations of the historical simulation of tail risk analytics in part e).

This part was generally well answered, as many candidates were able to articulate the limitations of using historical data only for inferring tail risks.

Part 3 g): The final part of Question 3 requires the candidates to articulate the practical business risks and considerations with using the proposed FX zero-cost collar strategy. This requires complex judgement and good sense of the business needs.

The better candidates were able to achieve the pass mark by stating one or two practical limitations with the zero-cost collar strategy. The poorer candidates confused the ask and reiterated the model limitations in Part Q3 f).

COURSE 6A GLOBAL INCOME RETIREMENT SYSTEMS

1. Summary

1.1. Course Overview

The aim of the GRIS 6A course is to provide the knowledge, skills and judgement necessary for an actuary to understand the different systems used to provide retirement incomes and recognise the management issues in areas of regulation, governance and risk management. The course is designed to teach actuaries to use the actuarial control cycle to identify issues and develop solutions. The course is not limited to the Australian retirement income field but has cross-border application.

1.2. Assessment

The assessment model is broken down into two parts:

Forum Participation 10%

Long Answer Question Exam 90%

1.3. Pass Rates

23 candidates enrolled this semester. Of these, 1 withdrew and 2 did not present, leaving 20 sitting the exam.

It is proposed that 7 candidates be awarded a pass, which implies a pass rate of 35%. Table 1 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
2017	20	7	35%			
2016	17	7	41%	15	5	33%
2015	21	10	48%	17	7	41%
2014	15	9	60%	11	7	64%
2013	19	8	42%	17	7	41%
2012	16	5	31%	14	3	21%
2011	18	9	50%	8	5	63%
2010	16	4	25%	13	7	54%
2009	14	5	36%	19	10	53%

The proposed 35% pass rate for this exam is slightly lower than the average pass rate for the previous exam (semester 1 2016 – 41%) and the historical average during my time as chief examiner (42%). Candidates typically found it difficult to get to the heart of the questions, which was slightly disappointing given that all 3 topics examined had been discussed in the participation forum leading up to the exam.

2. Assessment

2.1. Overall Performance

Although the exam paper was considered slightly easier than previous semesters (as judged by the examiners and scrutineers), the performance of this cohort of candidates on the whole was not as strong. This was reflected in a reduced pass rate despite a slightly lower pass mark compared to last semester. (Notwithstanding this last comment, the pass mark remained high historically reflecting the perceived difficulty – or ease – of this exam paper.)

The relatively low pass rate was particularly disappointing given that all 3 topics examined had been discussed in the participation forum leading up to the exam. This raises serious doubt as to the usefulness of the forum in its current form and this issue is considered more fully at section 2.1 of this report.

Many candidates struggled to demonstrate sufficient knowledge and understanding of the topics being examined, noticeably in LAQ2 and even more so in LAQ3. Undoubtedly when these elements are lacking it is difficult to apply reasonable judgement, which is considered the key element in achieving the standard fit to practise.

2.2. Exam Question by Question Analysis

Question 1

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	40	60			
Strong Pass (A)	35.5		89%		
Pass (B)	29	43.5	73%	9	45%
Slightly Below Standard (C)	26.1		65%	4	20%
Weak (D)	21		53%	5	25%
Showed Little Knowledge (E)	17		43%		
(F)	1		3%	2	10%
Did Not Attempt (X)	0				
Maximum Mark	33				
Average Mark	26.4				
Standard Deviation	6.5				
Coefficient of Variation	0.25				

This question required candidates to design a tax structure for a new pension scheme.

Part (a) sought classification of the Australian retirement model tax structure.

Part (b) sought calculations to determine the accumulated retirement benefit under three simple sets of assumptions provided.

Part (c) sought a report including objectives of the review, relevant considerations and recommendation.

Part (d) sought explanation for the impact on currency.

The markers felt the candidates performed well on the question overall and this was reflected in the relatively high pass rate.

As expected most candidates did well on part (a), which was effectively bookwork.

Most candidates performed the calculations in part (b), albeit with the occasional minor error, however some were unable to explain the results.

In part (c) the majority of candidates were able to provide reasonable recommendations. Some candidates appeared unable to grasp the context of the situation, with many of these merely reproducing objectives from the course notes, even where certain objectives did not apply.

None of the candidates identified the primary currency driver of sovereign debt, however most provided valid reasons, generally associated with increased investment.

Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	40	60			
Strong Pass (A)	29.5		74%	4	20%
Pass (B)	25.5	38.3	64%	3	15%
Slightly Below Standard (C)	23		58%	1	5%
Weak (D)	19.5		49%	9	45%
Showed Little Knowledge (E)	15.5		39%	2	10%
(F)	1		3%	1	5%
Did Not Attempt (X)	0				
Maximum Mark	32.5				
Average Mark	23.4				
Standard Deviation	6.1				
Coefficient of Variation	0.26				

This question required candidates to prepare a report to recommend initiatives to assist a pension system in financial distress. A corollary question sought further recommendation as to which initiative should be implemented first and why.

Most candidates managed to produce something that resembled a formal report, as required.

Better candidates managed to differentiate themselves by including the context of what the report was trying to achieve rather than merely repeating the question. Conversely poorer candidates struggled to link their initiatives to the requirements of the question and tended to misinterpret the effects.

As would be expected from a relatively open-ended question, responses were varied and wide-ranging. Many candidates (more than expected) attempted to use the same initiative presented differently, for example changing government regulation and changing fund regulation.

The corollary question was poorly answered. Very few candidates recognised the importance of recommending an initiative with immediate impact.

Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	40	60			
Strong Pass (A)	26		65%	4	20%
Pass (B)	20.1	30.2	50%	2	10%
Slightly Below Standard (C)	18		45%	6	30%
Weak (D)	15		38%	5	25%
Showed Little Knowledge (E)	13		33%	3	15%
(F)	1		3%		
Did Not Attempt (X)	0				
Maximum Mark	30				
Average Mark	19.6				
Standard Deviation	5.2				
Coefficient of Variation	0.26				

This question examined deferred annuities in a superannuation context.

Part (a) sought the advantages and disadvantages of a deferred lifetime annuity versus an immediate lifetime annuity from the perspective of a superannuation fund member.

Part (b) sought an estimate of the price of a deferred lifetime annuity under assumptions provided and the internal rate of return (IRR) if the annuitant lived to certain ages.

Part (c) sought changes to the Australian tax system that would increase the popularity of deferred annuities.

Part (d) sought consideration of white labelling deferred annuities and in particular the issues that would arise for a trustee.

This question was the worst answered by candidates as a whole.

Parts (a) and (c) were straightforward and should have been relatively easy marks.

There were many different approaches to evaluate the annuity and the IRR in part (b). Some candidates approached this exercise from a life office perspective, trying to separate capital, expenses and margins. The markers noted that most candidates (and the model solution) applied 6 and 16 payments, whereas they thought it should have been 5 and 15 payments. Both approaches were accepted.

As could be expected on the final question, some candidates failed to finish.

COURSE 10 COMMERCIAL ACTUARIAL PRACTICE

1. Summary

1.1. Course Outline

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. 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.
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

90 candidates completed the course. Of these, it is proposed that 37 be awarded a pass, representing a pass rate of 41%.

Table 1 – Recent Course Experience

Semester	Sat	Passed	Pass Rate %
Semester 1 2017	90	37	41
Semester 2 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

1.3.Candidate Numbers

A total of 91 candidates were originally enrolled for the CAP course in Semester 1 of 2017. 59 candidates attended the 4-day CAP residential course at MGSM, being all those sitting CAP for the first time. In addition, 2 repeat candidates attended for half a day as a refresher, one of whom scored the equal-top mark in the GI exam at their fifth attempt.

The candidate numbers and results can be summarised as follows:

	Total
Originally enrolled	91
Withdrawals	1
Absent	0
Presented	90
Passed	37
Failed	53

Table 2: Number of CAP Attempts

The results by number of attempts are as follows:

Attempt	Presented	Passed	Pass rate
1	57	24	42%
2	20	6	30%
3	5	3	60%
4	5	1	20%
5	2	2	100%
6			
7	1	1	100%
Total	90	37	41%

It is very pleasing to see the 3 passes of long-time students. Sadly, of the 6 failures sitting for the 3rd or 4th time, none was close to passing. Unlike in most semesters, there was not a high pass rate at the first attempt.

A summary of attempts by Exam topic (below) shows that all Investment passes were first-time candidates.

Topic	Pass	Fail
ERM	3.0	1.6
GI	1.5	1.5
GRIS	1.5	1.8
Invest	1.0	1.4
Life	2.1	1.8
Total	1.8	1.6

The higher attempt average for ERM reflects no students being first-timers. This may reflect a belief that choosing the ERM exam is a lower-risk option, or just a “try-something-else” strategy.

Table 3: Analysis by Topic

The analysis by chosen Exam Topic is as follows:

Exam Topic	Candidates	No. of passes	Pass rate
ERM	11	6	55%
GI	37	15	41%
GRIS	6	2	33%
Invest	17	6	35%
Life	19	8	42%
Total	90	37	41%

There is no good news here. Even ERM's relatively high pass rate included 2 who only just passed.

Table 4: Analysis by Examination Centre

The results by examination centre were as follows:

Centre	Presented	Passed	Pass rate
Melbourne	13	3	23%
Sydney	63	27	43%
Subtotal Australia	76	30	39%
Auckland	4	4	100%
Beijing	3	1	33%
Hong Kong	3	2	67%
London	2	0	0%
Malaysia	1	0	0%
Singapore	1	0	0%
Subtotal Overseas	14	7	50%
Total	90	37	41%

Auckland's 100% was 4 first-time candidates. As has been seen for 2 years past, Sydney outshone Melbourne, with Melbourne's failures spread across the exam topics and attempt numbers.

2. Course Administration

2.1 Course Outline

The overall objectives of the CAP course are to enable students to:

- Apply actuarial skills across a range of traditional and non-traditional areas by "contextualising" actuarial solutions or approaches in the wider commercial environment;
- Apply ethical concepts, corporate governance requirements and actuarial professional standards when writing a report; and
- Successfully communicate the actuarial solutions or approaches to a range of audiences.

Given these objectives, the assessment for the course is focused on the practical application of judgment and on the written communication skills of the students, rather than on bookwork. The two assessment tasks are:

1. A take-home Post-Course Assignment ("Assignment") on one of the 4 non-traditional topics (Banking, Health, ESG, Data Analytics), distributed after the 4-day residential course, for completion within 2 weeks. The Assignment is worth 20% of the final mark. The result and feedback were supplied to candidates 1 week prior to the Exam. The students were randomly allocated to each topic, aiming for approximately one-quarter to each topic, but subject to:
 - a) a check that repeat candidates are not allocated to the same topic 3 times in a row; and

- b) ensuring that no candidate was allocated a topic they had not attended at their Residential course. This is necessary because Data Analytics has only been offered at the latest 2 Residentials, and because candidates at those 2 Residentials have had some choice of topics.
- 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 absorb the question material, choose 1 from the 5 mainstream topics (Life, General, Investment, GRIS, ERM), perform all the necessary analysis and prepare a written report (typically 10 to 15 pages plus any appendices).

The pass mark is 50%, which is regarded as equivalent to the 60% pass mark adopted for the other part III courses.

2.2 Examiners

The examiners for this semester were:

Chief Examiner: Bruce Thomson

Assistant Examiner: Matthew Ralph

2.3 Course Leader

The Course Leader for this semester was: David Service

The CAP Faculty Chair for this semester was: Bridget Browne

2.4 Scrutineer Review of Exam & Assignment

Thank you to Karkan Lo, Phin Wern Ting, Michael Storozhev, Roman Kashkarov, Alex Leung, Anthony Locke, Kris Mccullough, Stephen Edwards and Wan Wah Wong, recently qualified Fellows, who each reviewed 1 of the 9 case studies to assess the appropriateness and precision of instructions, the difficulty of the content and the expected time required for completion. In addition, Young Tan and Vivian Dang scrutineered GRIS as part of their orientation for taking over as authors next semester.

2.5 Preparation of Case Studies

Case studies were prepared by the Course Presenters in the 9 topic areas listed below. Each was designed to be completed within 8 hours under exam conditions, even though the 4 non-traditional topics were completed as a take-home assignment. Each was fine-tuned in consultation with the Chief Examiner, formally scrutineered, and signed off by the Examiners.

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

Topic	Course Presenter / Author
Health	Andrew Gale
Banking	David Service
Environment	Naomi Edwards
Data Analytics	Colin Priest
ERM	Bridget Browne
Life Insurance	David Service
Investments	Gary Khemka
GRIS	Minjie Shen
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. Peter Martin was Marker 2 for Life, as he has been for many years. Stuart Crockett was Marker 2 for Banking, as he has been for several semesters now.

3. 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 88% with an average of 61%. 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 were particularly useful to candidates.

75 of the 90 candidates were awarded a "pass" mark of 50% or more, with 5, 4, 2 and 4 failures in Banking, Data Analytics, ESG and Health respectively.

It was suggested to candidates that a Credit or better (as achieved by 51% of candidates) was a better indication of likely overall success. However, the correlation between Assignment and Exam marks remains low.

3.1 Banking

The Banking case study required candidates to advise a government on the practicality and pricing of a government guarantee to replace mandated minimum capital standards for banks.

3.2 Data Analytics

The Data Analytics case study required candidates to analyse results from a test campaign and recommend how to optimize profit from a full direct marketing campaign.

Candidates generally did well with the analysis, but weaknesses were in ensuring that comments were justified and targeted to the non-technical audience.

3.3 ESG

The ESG case study required candidates to advise a fictional government (remarkably similar to Tasmania) about risks to its hydro-electric power generation. Modelling of seasonal rainfall, dam levels and consumer consumption was required.

Most students were creative with ideas and clear communication, but a significant minority were not specific with their recommendations.

3.4 Health

The Health case study required candidates to advise the Australian Health Minister on options for categorizing health insurance products and how they could be used in the private health insurance market, with a recommended option. Secondly, advice was also required on how actuarial analysis and modelling could aid consideration of product designs for rural communities.

The question was generally well answered, with most providing at least 2 options, making practical points, and supporting a recommendation.

4 Exam results

4.1 ERM

The ERM Exam required candidates to prepare a risk management report for a government statistical agency, covering strategy, appetite statement, risk management for a specific current governmental data linking programme, and the use of cyber insurance.

4.2 GRIS

The Exam for Global Retirement Income Systems required candidates to advise a mythical government on "fairness" of retirement systems, with commentary on its existing system and suggestions for improvements. It was expected that a model would be built to assess costs to government and the costs of proposed changes.

4.3 Life Insurance

The Life case required candidates to advise a mythical government Treasurer, just before an election, on retirement income options for changing allocated pensions, mandating life annuities or introducing a government longevity guarantee. The relative costs to government were important, as was the population's past aversion to lifetime annuities.

4.4 Investment

This case required candidates to provide an internal report to a fund manager on the design of a retirement investment product including a guarantee of minimum performance. Return on capital, product marketability and product durations had to be considered.

4.5 General Insurance

The General Insurance exam required candidates to respond on behalf of a CTP insurer to public criticism of the industry's perceived excess profiteering. The candidates were expected to identify that previous actuarial pricing work had been unreasonably conservative and comment appropriately.

END