Report to ECC from the Board of Examiners

SEMESTER 1 2016

PART III

BOARD OF EXAMINERS' REPORT

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CHAIR'S REPORT

Summary

1. Examinations

The Semester 1 2016 Part III examinations of the Actuaries Institute ("Institute") were held from the 26 April to the 5 May 2016.

2. Pass Rates

The number of candidates presenting for the Semester 1 2016 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

	2016 (1)			2015 (2)			2015 (1)		
	Sat	**Pass**	**%**	**Sat**	**Pass**	**%**	**Sat**	**Pass**	**%**
2A Life Insurance	82	16	**20**	57	18	32	65	20	31
2B Life Insurance	50	11	**22**	50	17	34	53	21	40
3A General Insurance	106	35	**33**	82	23	28	90	28	31
3B General Insurance	55	17	**31**	54	20	37	54	20	37
5A Invest. Man. & Fin.	n/a	n/a	**n/a**	49	10	20	n/a	n/a	n/a
5B Invest. Man. & Fin.	34	4	**12**	n/a	n/a	n/a	24	15	63
6A GRIS	17	7	**41**	n/a	n/a	n/a	21	10	48
6B GRIS	n/a	n/a	**n/a**	17	7	41	n/a	n/a	n/a
ST9 ERM	96	34	**35**	92	44	54	104	38	37
ST1 Health & Care	15	3	**20**	82	41	50	19	6	32
C10 CAP	80	45	**56**	81	51	63	78	47	60
Total	**535**	**172**	**32%**	**564**	**231**	**41%**	**508**	**205**	**40%**

MCQs were removed from the assessment for this semester for subjects 2A, 2B, 3A, 3B, 5B and 6A. The assessment for this semester comprised 10% online forum participation and 90% for three long answer exam questions.

The Chief Examiners aim to produce consistent standard of passing candidates, rather than a consistent pass rate from year to year. The overall pass rate for this semester is 32%, which is lower than the 41% pass rate for the previous semester.

The fall in the overall pass rate is mainly due the disappointing pass rates for subjects 2A, 2B and 5B which have decreased significantly 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

2016 (1)	2015 (2)	2015 (1)	2014 (2)	2014 (1)	2013 (2)	2013 (1)	2012 (2)
32	29	29	39	32	31	29	27

4. Online Forum Participation

The online forum participation continued for all Institute's 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 (excluding those who withdrew or did not sit the exam):

Frequency Distribution for Semester 1 2016

Participation Mark	Subject						
	2A	**2B**	**3A**	**3B**	**5B**	**6A**	**Total**
10	20	2	64	26	29	13	154
9	32	11	18	15	0	1	77
8	15	26	13	9	2	2	67
7	3	4	1	2	0	0	10
6	2	1	0	0	0	0	3
5	3	2	5	1	0	0	11
4	0	1	2	0	0	0	3
3	1	0	0	0	1	1	3
2	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
0	6	3	3	2	2	0	16
No. of Candidates	82	50	106	55	34	17	344
Average Mark	8.0	7.5	8.9	8.8	9.1	9.3	8.5

Observations:

- The engagement by students in the online forums continues to be very good. This is a pleasing result.
- The proportion of students achieving the maximum mark of 10/10 is 45%, which continues to be at a high level, a 7% increase from the 37% for the previous semester.
- Although the average participation mark for 2B has increased from 7.0 (last semester) to 7.5 for this semester, it still has the lowest average participation mark of all the subjects. It also has the lowest proportion of students achieving the maximum mark of 10/10 at 4%.

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	Long Answer Question Writers: Fei Zhang, Jennifer Bonnett, Stephen Edwards Tutorials: Richard Land Forum Participation: Andrew Patterson
3A	Exam: Julianna Shing Tutorials: Jeff Thorpe Forum Participation: Jacqueline Reid
3B	Exam: Jacqui Reid Tutorials: Ben Qin Forum Participation: Mathew Ayoub
5B	Exam: Andrew Leung Tutorials, Forum Participation: Marlon Chan
6A	Exam, Tutorials and Forum Participation: Vivian Dang
CAP	Exam: David Service, Julie Cook, Colin Priest, Bruce Edwards, Bridget Browne Post-Course Assignment: Naomi Edwards, Kirsten Armstrong, David Service
ST9	This course is run completely external to the Institute.
ST1	This course is run completely external to the Institute.
F101	This course is run completely external to the Institute

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	Matthew Wood
Course 3A:	General Insurance	James Pettifer
Course 3B:	General Insurance	Jacob Sharff
Course 5B:	Investment Management & Finance	Charles Qin & Claymore Marshall
Course 6A:	Global Retirement Income Systems	Stephen Woods
Course 10:	Commercial Actuarial Practice	Bruce Thomson

I would like to take this opportunity to thank all of 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.

2.3. 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
21 January 2016	• 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
31 March 2016	• 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.
10 June 2016	• Review the recommended pass lists and treatment of borderline candidates.

2.4. Assistant Examiners

The Assistant Examiners for this semester were:

Course 2A:	Life Insurance	Alice Truong & Julia Lessing
Course 2B:	Life Insurance	Danny Bechara & David Ticehurst
Course 3A:	General Insurance	Daniel Lavender & Andrew Teh
Course 3B:	General Insurance	James Fitzpatrick
Course 5B:	Investment Management & Finance	N/A
Course 6A:	Global Retirement Income Systems	Jim Repanis
Course 10:	Commercial Actuarial Practice	Matthew Ralph

2.5. Scrutineers

The Scrutineers for Semester 1 2016 were:

Table 3: Scrutineers

Course	Longer Answer Questions, Case Study Assignment and Exam
Course 2A	Quanyie Tan, Christine See
Course 2B	Zeger Sun
Course 3A	Andrew Ngai
Course 3B	Jimmy Molyneux
Course 5B	Jonathan Ng
Course 6A	Nathan Bonarius, Stuart Mules, Young Tan
Course 10	David Shuvalov (Life Insurance) Weimin Xie (Investments) Stephen Edwards (Health) Young Tan (GRIS) Yongjie Qi (General Insurance) Ai Nee Seow (ERM) Kris McCullough (ESG) Stephen Lynch (Banking)

3. Exam Administration and Supervision

The Board of Examiners was ably assisted by a number of Institute staff, the Education Team, in particular Sarah Tedesco and Karenna Chhoeung. 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 for the production of this report. They did a great job and the Board of Examiners team is indebted to them all.

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

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

4. Exam Candidature

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	2016 (1)	2015 (2)	2015 (1)	2014 (2)	2014 (1)
Life Insurance	31%	27%	32%	29%	32%
General Insurance	38%	35%	37%	37%	34%
Investment Management & Finance	8%	13%	6%	9%	6%
Global Retirement Income Systems	4%	4%	5%	3%	4%
Commercial Actuarial Practice	19%	21%	20%	23%	23%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

BoE Members for Semester 2 2016

1. Board of Examiners

The composition of the Board of Examiners for next semester (semester 2 2016) is as follows:

1.1. Chair

Gary Musgrave

1.2. Chief Examiners

Course 2A: Life Insurance	Andy Siu
Course 2B: Life Insurance	Danny Bechara
Course 3A: General Insurance	James Pettifer
Course 3B: General Insurance	James Fitzpatrick
Course 5A: Investment Management & Finance	Andrew Goddard & Syd Bone
Course 6B: GRIS	Stephen Woods
Course 10: Commercial Actuarial Practice	Bruce Thomson

1.3. Assistant Examiners

Course 2A: Life Insurance	Alice Truong, Catherine Watson
Course 2B: Life Insurance	David Ticehurst, Robert Herlinger
Course 3A: General Insurance	Daniel Lavender, 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 2016 are as follows:

Table 5: Examination Dates

Module	Subject	Exam Date
1 (7A – ST9)	Enterprise Risk Management	28 September
1 (STI)	Health & Care (IFoA)	6 October
1 (F101)	Health Principles(ASSA)	TBC
2 (3A)	General Insurance	11 October
3 (3B)	General Insurance	12 October
2 (2A)	Life Insurance	14 October
3 (2B)	Life Insurance	17 October
2 (5A)	Investment Management & Finance	18 October
3 (6B)	Global Retirement Income Systems	19 October
4 (10)	Commercial Actuarial Practice	20 October

3. Exam Solutions

The Board of Examiners have agreed to release this semester's examination questions only. The marking guides will be used as learning resources in Semester 2 2016.

Gary Musgrave
Chair of the BOE
20th July 2016

EXAMINER REPORTS *SEMESTER 1 2016*

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

84 candidates enrolled this semester. Of these, 1 candidate withdrew and 1 candidate did not present, leaving 82 sitting the exam.

It is proposed that 16 candidates be awarded a pass, which implies a pass rate of 20%. Table 1 shows the historical pass rates for this subject:

Table – Course Experience

SEMESTER	SAT	PASSED	PASS RATE
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 significantly lower than the 32% pass rate for the previous exam (Semester 2 2015) and the historical average. Candidates tended to do well in the parts of the questions involving spreadsheet work but poorly in the written parts of the questions, often failing to demonstrate an understanding of the key concepts being tested or to present reasonable arguments to support the points raised. This is discussed further in section 2.7.

2. Assessment

2.1. Overall Performance

The pass rate for this semester is 20%, which is poor and significantly lower than in previous semesters.

Performance in the forum participation component was strong, with a pass rate of 85.5%. As in previous semesters, the forum participation component was not a good differentiator of the quality of the candidates.

Overall, the LAQ component was very poorly done. The LAQs were designed to cover a reasonable spread of topics and practice areas, with question 1 covering unit pricing and operational risk, question 2 covering direct vs retail YRT pricing and question 3 covering group vs retail TPD claims experience. There was a lack of consistency in the performance of most candidates across all three LAQs, suggesting a lack of broad understanding of the issues. Very few candidates appeared strong across all areas of assessment, with only the top three candidates scoring grades of B or better across all three LAQs.

Many candidates did well in the spreadsheet calculation components of the LAQs but failed to do so in the written components, either showing a lack of understanding of the key concepts being tested in the questions, being unable to articulate their arguments to support the points raised, or both.

Some of the written components of the LAQs, for example in questions 1 and 3, were fairly open and invited candidates to raise and discuss points in relation to the topic at hand. Question 2 was more prescriptive, requiring candidates to recommend a number of pricing assumptions for a particular product and explain their recommendation, as well as recommendations on how to remediate profit profitability issues identified in light of their recommended assumptions. None of these were done particularly well, suggesting that the openness or prescriptiveness of the written components did not have a material impact on performance.

2.2. Exam Question by Question Analysis

Table – Question 1

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**60**	**60**			
Strong Pass (A)	40.0	40.0	66.7%	6	7%
Pass (B)	35.0	35.0	58.3%	25	30%
Slightly Below Standard (C)	31.5	31.5	52.5%	20	24%
Weak (D)	26.0	26.0	43.3%	18	22%
Showed Little Knowledge (E)	16.0	16.0	26.7%	11	13%
Did Not Attempt (X)	1.0	1.0	1.7%	2	2%
Maximum Mark	45.5	45.5			
Average Mark	31.9	31.9			
Standard Deviation	6.6	6.6			
Coefficient of Variation	0.21	0.21			

Question 1 was about rectifying a unit pricing error and discussing the operational risks involved in outsourcing the unit pricing function. Candidates performed relatively well on this question compared to the other 2 questions, with a pass rate of 38%.

Part a) (15 marks):

Candidates were asked to reconstruct NAV and unit prices over a period of several days following the correction of an error and calculate the compensation payable to a particular unit holder.

Most candidates did very well on part a) of this question. The marks available were generous relative to the difficulty of the question. The most common mistakes were:

- candidates not allowing for growth for the understated amount for the NAV in the calculation of the revised opening NAV;
- incorrectly allowing for interest on the compensation amount; and
- incorrectly calculating the NAV on 4/4/2015 to effectively assume the unit pricing fund would be paying the compensation i.e. NAV was lower than the marking guide solution by the amount of the compensation.

Part b) (15 marks):

Candidates were asked to discuss operational risks arising from an outsourcing arrangement and how to mitigate these risks.

Generally, this part of the question was not answered very well.

It was disappointing to see how little discussion and explanation some candidates believe is required for a 15 mark question.

There were only a few candidates who mentioned Prudential Standard CPS 231 Outsourcing, which covers the requirements for all outsourcing arrangements entered into by an APRA-regulated institution.

There are some candidates who concentrated their discussion on the risk and mitigation of inadequate controls to ensure accuracy of unit prices, rather than considering all the risks related to outsourcing.

Many candidates did not align their mitigations to the risks they had identified and some candidates seemed to get risks and mitigations confused. For example, they gave a heading of "Risks" and then mentioned mitigations rather than risks. A number of candidates gave very general responses regarding risks and mitigations rather than answering in the context of the question relating to outsourcing.

Overall, the Markers felt the available marks were too generous for part (a) relative to part (b), and the pass mark was set accordingly.

Table – Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**60**	**60**			
Strong Pass (A)	31.5	31.5	52.5%	6	7%
Pass (B)	26.0	26.0	43.3%	16	20%
Slightly Below Standard (C)	23.4	23.4	39.0%	5	6%
Weak (D)	20.0	20.0	33.3%	23	28%
Showed Little Knowledge (E)	14.5	14.5	24.2%	22	27%
Did Not Attempt (X)	1.0	1.0	1.7%	10	12%
Maximum Mark	37.0	37.0			
Average Mark	21.4	21.4			
Standard Deviation	6.7	6.7			
Coefficient of Variation	0.31	0.31			

Question 2 was about pricing a direct YRT product, using an equivalent retail YRT product as the starting point. Candidates performed relatively poorly on this question, with a pass rate of 26.8%.

Most candidates were able to recommend the mortality and investment assumptions for part (a), and identify levers to manage mortality experience in part (c). However, most candidates struggled with the following:

- Setting the expense and lapse assumptions in part (a), particularly expenses.
- Having a broader range of options in part (c), with most candidates failing to cover the marketing costs and the option not to proceed.
- Having sufficient time to attempt part (c) fully, as they spent too much time in either part (a), or the other two questions.

There were also a several instances of dangerous statements/misunderstandings made when setting lapse and mortality assumptions in part (a). This suggests a lack of understanding of direct marketing products by some candidates.

Part a) (15 marks):

Candidates were asked to recommend a set of pricing assumptions for a direct YRT product, using the assumption set for a retail YRT product as a starting point.

Candidates were generally able to earn marks for the mortality and investment assumptions. Common mistakes made were:

- Expense assumptions:

  - Most candidates allocated marketing costs to maintenance rather than acquisition expenses. While the question expressed marketing costs as $0.5m per annum, the stronger candidates were able to recognise that marketing expenses in future years were likely to be acquisition costs for future cohorts of sales rather than maintenance expenses for the current cohort. The marking guide allowed for marks to be awarded for candidates who justify the allocation of marketing expenses to maintenance by linking it to maintenance activities such as retention, but very few candidates did that.
  - Most candidates did not allow for administration and overheads, but only the additional IT and marketing costs.
  - Most candidates did not recognise that the cost of acquiring direct YRT is the same regardless of case size, and continued to set expense assumptions as a percentage of premium.
  - Most candidates did not discuss the expense inflation assumption which cost them an easy mark.
  - Several candidates did not articulate clearly how their discussions translated into the proposed assumptions.

- Lapse assumptions:

  - Most candidates recognised that lapses for direct YRT will be higher, but did not recognise the difference in the shape of the lapse rates by duration in-force.
  - A small handful of candidates suggested that lapses for direct YRT will be lower than retail YRT.

Part b) (5 marks):

Candidates were asked to model each assumption change and explain their impacts.

Most candidates earned 0.5 marks for producing the table. Main issues are:

- Candidates performed the movement analysis incorrectly by not retaining the assumption changes from the prior steps when changing the assumptions.
- Lack of explanation of the movement of the financial metrics, and did not recognise that the final outcome is under the hurdle rate which is not acceptable.

Part c) (10 marks):

Candidates were asked to discuss options to address the profitability issues identified in part (b).

Many candidates were able to provide options to deal with profitability issues caused by higher mortality, but did not provide a sufficiently broad discussion of other drivers (such as the lapse and marketing aspects) to produce a reasonable attempt. It is also evident that some candidates were struggling for time at this stage, and therefore did not provide sufficient points or left the question out altogether.

Table – Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**60**	**60**			
Strong Pass (A)	32.0	32.0	53.3%	2	2%
Pass (B)	26.0	26.0	43.3%	21	26%
Slightly Below Standard (C)	23.4	23.4	39.0%	9	11%
Weak (D)	20.0	20.0	33.3%	27	33%
Showed Little Knowledge (E)	16.0	16.0	26.7%	13	16%
Did Not Attempt (X)	1.0	1.0	1.7%	9	11%
Maximum Mark	35.0	35.0			
Average Mark	22.0	22.0			
Standard Deviation	6.1	6.1			
Coefficient of Variation	0.28	0.28			

Question 3 was about the claims experience of a company's individual TPD product and its group TPD product. Candidates performed relatively poorly on this question, with a pass rate of 28%.

Overall, the question was poorly answered: the average score across the 82 candidates who submitted a solution was 11/30. Given that there was a maximum of 48 possible marks (to score the maximum 30 from), this is a very poor result.

The Markers felt that, despite being as generous as they could be (given exam conditions), candidates did not have a good grasp of the issues. This was despite the question giving a reasonable steer along with some obvious facts that lead to easy marks e.g. poor scheme data in 2012, the $10m individual claim etc.

Part a) (2 marks):

Candidates were asked to explain why loss ratios are used in group risk business while A/Es are used in individual risk business.

Despite being very straightforward – low level risk rating detail (individual risk) v higher level risk rating data (group risk) to get the full 2 marks (with an additional 1.5 available on top), many candidates struggled. The average was only 0.7 out of 2. Candidates who passed averaged 1 out of 2 marks.

Part b) (5 marks):

Candidates were asked to compare and contrast underwriting for group and individual risk business and discuss the implications of this for group business.

This was again answered very poorly (average of only 1.8/5 with up to 7 marks available to score the max. 5 from). Most candidates understood full medical underwriting v AAL (for 1 mark in total) but very few got that underwriting is an overall risk assessment which for group means consideration of more holistic rating factors e.g. industry/occupation. Only a couple of candidates mentioned the importance of complete/accurate data or concentration risk despite this being the backbone of the entire question. The better candidates (grade B) managed an average of 2.4 which is roughly half, which showed a broader general understanding than the rest and were therefore considered worthy of a pass.

Part c) (23 marks):

Candidates were asked to draft a memo to the Head of Products to discuss TPD experience for individual and group, including (a) features in the experience that are concerning (4 marks); (b) additional information required (6 marks) and (c) recommendations (13 marks).

Candidates really struggled with this open question, despite a many obvious pointers in the question text. The observational elements should have been very straightforward but lots of candidates were unable to correctly interpret the numerical factual results given. The average across this section was only 8.5/23. However, the better candidates (Grade B+) managed 12 or around half; hence a pass. Common mistakes in this question included:

- Many candidates stated that the individual TPD experience was poor or trending worse over the entire period, which it wasn't (gross A/E bounced around 1 for all except 2015 which, as the question clearly stated, was due to the 10m claim). Hence, apart from the large claim, individual experience was very close to expected. This shouldn't be surprising given the company's 15 year tenure in this market relative to 5 years in group (again clearly stated in the question).
- Candidates stating the large $10m claim was attributed to the Group portfolio (when it was clearly stated in the question that it was included in the Individual portfolio)
- That the Group experience would be much worse than the Individual experience (or the opposite in some cases) and not realising that the ratios were gross of reinsurance.
- Several candidates recommended increasing premiums or increasing reinsurance as the solution to the insurer's problem without mentioning the constraints and additional costs.

The majority of candidates simply did not make sufficient points in their solution i.e. there were 13 marks for recommendations so several points needed to be made to pass this section. It was clear that several candidates ran out of time to present a detailed solution with sufficient points. However, there were many easy marks to be awarded for reading the question and restating the points presented e.g. memo format (1/2 mark), comments on strategy, pricing aggressively, reputation, target market, 2012 scheme, incomplete data, delays in claims, economic downturn etc.

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

54 candidates enrolled this semester. Of these, 0 withdrew and 4 did not present, leaving 50 sitting the exam.

It is proposed that 11 candidates be awarded a pass, which implies a pass rate of 22%. Table 1 shows the historical pass rates for this subject:

Table – Course Experience

SEMESTER	SAT	PASSED	PASS RATE
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 22% pass rate for this exam is lower than the 34% pass rate for the previous exam (Semester 2 2015) and below the historical average of 33%.

2. Assessment

2.1. Overall Performance

The quality of the submissions to the Forum was generally very high but is still surprising to see some students who do not attempt to meet the minimum standards. It would seem foolish to throw away these marks as in some cases can mean the difference between passing and failing.

The approach taken for the LAQs with regards to the splits between spreadsheet work and complex judgement was the same as last semester. This made the questions excellent discriminators, in particular, when assessing the borderline candidates.

The performance in the LAQs was poorer than previous semesters although it was variable – indicating that they were excellent discriminators of performance. Some candidates performed very well on one or two of the questions but performed badly on the others – potentially lack of time was part of the reason for this. This could be an indication that students are not ensuring that they have good knowledge of the entire course and are instead focusing on certain areas.

There is some concern around the candidate's lack of knowledge of the Capital standards – this was evident in question 1. Candidates are also being let down by not being reading the question correctly – for example discussing all of the components of the analysis of profit when only claims experience was asked for. There is also evidence of lack of knowledge of what the Appointed Actuary does.

2.2. Exam Question by Question Analysis

Table – Question 1

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**46.0**	**69.0**			
Strong Pass	28.0	42.0	60.9%	2	4%
Pass	21.0	31.5	45.7%	8	16%
Slightly Below Standard	18.9	28.4	41.1%	6	12%
Below Standard	14.0	21.0	30.4%	17	34%
Weak	12.0	18.0	26.1%	6	12%
Showed Little Knowledge	1.0	1.5	2.2%	11	22%
Did Not Attempt	0.0	0.0	0.0%	0	0%
Maximum Mark	33.0	49.5			
Average Mark	16.3	24.4			
Standard Deviation	6.2	9.2			
Co-efficient of Variation	0.38	0.38			

This question was about projecting a balance sheet and capital position (part (a) and applying some prescribed regulatory stress tests (part b)i)). It then asked candidates to suggest actions that could be made by the Appointed Actuary (part b)ii)) and then management (part b) iii) in response to these stresses. A scenario was requested for a stress that would cause the company to go insolvent (part b)iii)). Finally, commentary was required on the outcome of the stress tests and views given on the existing Target Capital methodology (part (c)).

The quality of the answers was variable – indicating that this question was a good discriminator, although most candidates struggled with b)ii) and b)iii).

Generally parts a), b)i), and d) were answered well. However, it was evident that the majority of students struggled to interpret the question, particularly with parts b)ii) & c).

The pass rate for this question was quite poor, at 20%.

For parts b)ii) and b)iii), most candidates did not understand the role of the Appointed Actuary. The Appointed Actuary would be responsible for recommending the best estimate assumptions but not the implementation of management actions.

Time management seemed also to be a factor. Quite a few students failed to answer parts c) and d) and in most cases, there was no quantification of parts b)ii) and b)iii). A lenient view was taken with these two parts and marks were awarded based on the written comments. Time may have been an issue for this question.

It should be noted that there were a significant number of easy marks to be had in this question. Many students failed to read the question properly and did not answer within the context of the question (e.g. changing investment strategy as a management action to reduce capital requirements). It was disappointing that so many students were not able to calculate a simple balance sheet and profit and loss statement. There were also a few hints in the question itself e.g. shareholders were not in a position to inject capital but were prepared to accept volatile dividends.

There was evidence that reasonableness checks were generally not being carried out – for example, equity should equal net assets, and the capital base is unlikely to be greater than 500% of the capital requirement.

There were a few instances where the student showed a serious lack of understanding. For example, it was recommended that sales are increased as a management action to reduce capital requirements.

Table – Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**38.0**	**57.0**			
Strong Pass	21.9	32.9	57.6%	8	16%
Pass	18.5	27.8	48.7%	13	26%
Slightly Below Standard	16.7	25.0	43.8%	9	18%
Below Standard	14.0	21.0	36.8%	13	26%
Weak	10.5	15.8	27.6%	4	8%
Showed Little Knowledge	1.0	1.5	2.6%	3	6%
Did Not Attempt	0.0	0.0	0.0%	0	0%
Maximum Mark	28.0	42.0			
Average Mark	17.5	26.2			
Standard Deviation	4.3	6.4			
Co-efficient of Variation	0.24	0.24			

This question was focussed on the management of a running-off participating business portfolio. Part a) was simply bookwork describing the differences between non-par and par under MoS. Part b) was a small par business calculation. Part c) involved drafting a response to the CFO around ways to manage the portfolio.

This question was generally answered fairly well, though the quality of the answers was variable – indicating that this question was a good discriminator.

The pass rate for this question was quite pleasing for a question on participating business, at 40%.

Part a) was largely a bookwork question and was mostly done fairly well, but it is surprising how many students failed to mention basic formulae that would give easy marks. What was notable was that students generally were capable of the two basic formulae and the main differences between the two, but really failed to explain the basics of MoS methodology for par business.

In the part b) simple calculation question, students either performed very well or not at all, with little in the middle. Many students became confused over the definition and hence calculation of the shareholder profit, mixing it up with the distribution upon bonus declaration.

Part c) saw students struggle a little more. Equity generally got a mention under both the one-off declaration and the purchase, but many other points were missed. The parts on distribution and funding business in another Statutory Fund were pretty straightforward, so the balance of the 12 marks would be anticipated to be in the middle section, therefore requiring enough thought to generate a number of points. The students that did well in these two parts of the question were the ones who thought practically about the situation and checked through all the things that would have to happen if they were responsible for the suggested action taking place. This brought out considerations around administrative difficulties, likely differences between the two portfolios and sometimes better ways of handling the situation, such as a terminal bonus.

Table – Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**36.0**	**54.0**			
Strong Pass	18.0	27.0	50.0%	0	0%
Pass	13.0	19.5	36.1%	12	24%
Slightly Below Standard	11.7	17.6	32.5%	4	8%
Below Standard	9.0	13.5	25.0%	17	34%
Weak	6.0	9.0	16.7%	7	14%
Showed Little Knowledge	1.0	1.5	2.8%	9	18%
Did Not Attempt	0.0	0.0	0.0%	1	2%
Maximum Mark	17.0	25.5			
Average Mark	9.5	14.3			
Standard Deviation	3.9	5.9			
Co-efficient of Variation	0.41	0.41			

This question explored the issues to be considered and implications of a strengthening of the Disability Income morbidity assumptions and of allowing for future pricing increases and impacts on reported profitability and analysis of profit.

The quality of responses indicates that a number of candidates may have been running out of time as they progressed through this question with limited responses provided in some parts. There was also evidence that candidates hadn't spent a lot of time thinking about the relevant issues and relating their response to the specific question. However there was some variability in the quality of the answers suggesting that it was a good discriminator.

Overall, this question was intended to be relatively straight-forward, however, the responses received were generally poor, with not many candidates performing well on this question.

The pass rate for this question was quite poor, at 22%.

Part a) provided candidates with an opportunity to score a lot of marks, as the question was fairly broad. However, not many candidates discussed the broader issues, instead focussed on only a few big themes. Financial implications were generally covered off quite well by most candidates, including the impact on sales and lapses resulting from the premium rate increase. Most candidates did not go further to talk about implications and general wider business considerations relating to a premium rate increase including IT and marketing implications. Most candidates failed to point out auditor signoff, and the requirement for AA LPS320 sign off relating to product changes.

Part b) was quite specific, it focussed on Disability Income claims experience. This was not answered well, most candidates demonstrated limited knowledge in this area. This question was generally seen as a good differentiator between strong and weak candidates. A few good responses spoke about the different components of the claims experience in the DI AOP and the implications of the new DI table on expected claims. However, most candidates did not demonstrate a clear understanding of the dynamics involved within the DI claims experience AOP line. A common mistake was that candidates confused the question and talked about the full DI AOP as opposed to focussing solely on claims experience.

Similarly, part c) was not answered very well as it was evident that many candidates only skimmed the surface of this question without thinking deeply. Good candidates in this part were able to give a quantitative and qualitative assessment of the impact on expected profits resulting from the proposed changes. The weaker responses generally provided a qualitative assessment but did not proceed to successfully quantify it. Not many candidates delved more broadly into the reasons for the impact on the expected profit.

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

112 candidates enrolled this semester. Of these, 2 withdrew and 4 did not present, leaving 106 sitting the exam.

It is proposed that 35 candidates be awarded a pass, which implies a pass rate of 33% Table – Course Experience shows the historical pass rates for this subject:

Table – Course Experience

SEMESTER	SAT	PASSED	PASS RATE
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 33% pass rate is the highest pass seen since the exam back in Semester 1, 2011. Many candidates seemed to struggle with regards to time pressure and with the last 2 questions of the paper.

2. Assessment

2.1. Overall Performance

Overall student performance on the exam was significantly worse than expected. The exam was scrutineered and the scrutineer was able to achieve over 70% of the marks on each question under the 3-hour time frame. Following a phone discussion with the scrutineer, we identified that the scrutineer was a very strong candidate and reduced the length of the questions slightly.

For the actual exam, in general, candidates seemed to be under significant time pressure. It is noted that the previous exam was designed to be completed in 2 hours whereas the current exam had been designed to be completed in 3 hours and this may have resulted in candidates not being prepared for the longer exam. Question 1 was very well answered but the responses to Question 2 and Question 3 were typically very poor. The examiners and markers were very concerned that the vast majority of students appeared to be unable to use a bf method which would considered to be one of the key reserving models.

2.2. Exam Question by Question Analysis

Table – Question 1

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**40.0**	**60.0**			
Strong Pass	30.0	45.0	75.0%	3	3%
Pass	20.0	30.0	50.0%	53	48%
Slightly Below Standard	18.0	27.0	45.0%	11	10%
Below Standard	14.0	21.0	35.0%	25	23%
Weak	8.0	12.0	20.0%	10	9%
Showed Little Knowledge	1.0	1.5	2.5%	4	4%
Did Not Attempt	0.0	0.0	0.0%	4	4%
Maximum Mark	32.0	48.0			
Average Mark	19.0	28.4			
Standard Deviation	6.5	9.8			
Co-efficient of Variation	0.34	0.34			

The question was on the future introduction of driverless cars and the range of impacts it would have across CTP and FTO portfolios. There was focus around impacts on claim frequency / size, underwriting and insurability strategies, reinsurance implications, data required, impact from government / regulator.

Overall, candidates performed very well on this question, with a pass rate of 50.9%. The question was designed to be slightly easier than the other questions in the paper with no calculation part to the question. The question had largely independent sub parts which allowed good candidates to be able to show a strong understanding of the situation and how it would impact the insurance environment.

Part a):

This was a simple question around how the movement towards driverless cars would impact the frequency and average claim size of the CTP and Fire and Theft Domestic Motor products. This was generally well answered although there were a significant number of students who either: confused Comprehensive motor with CTP or did not provide a separate answer for each of Fire and Theft which was asked for directly in the question. The average mark for this part was 2.9/4.

Part b):

This was a more challenging question around what the impact would be with regards to the change in the risks insured. Candidates then needed to ask how this would impact the company from a financial risk perspective, to identify possible mitigation strategies and how they would identify whether these strategies would be viable before implementation. This was generally well answered with most students identifying that there would be similarities with a product liability cover and that this could result in significant concentration risk. Many students were able to identify sensible strategies to address some of the additional risk and how these could be tested although some did go for generic solutions such as using a DFA model which would be difficult in this specific case due to a lack of data. The average mark for this part was 2.9/6.

Part c):

Candidates were asked around what changes may need to be made to the reinsurance program following these changes. Most candidates were able to identify that the key change required was around the accumulations of risk from a manufacturer fault or a hacking incident. Some students suggested moving to a surplus program which showed a lack of understanding of the type of reinsurance and the product. The average mark for this part was 1.2/4.

Part d):

Candidates were asked around some concerns from the CTP claims team in NSW around the introduction of driverless cars and their impact on claims costs and expenses. A significant proportion of students identified that the key issue is that NSW CTP is an at fault scheme and that it would not be clear with a driverless car who is at fault. The average mark for this part was 1.1/2.

Part e):

Candidates were asked for additional information that may assist underwriting or claims from driverless cars and why this information would be useful. Many student listed useful information but only provided limited explanation for why it is relevant. Very few students addressed the additional information that would be useful for the claims team. The average mark for this part was 0.7/2.

Part f):

Candidates were asked around what were the key points that an insurance lobby group needed to try and achieve. Many candidates were awarded marks for recognizing the need for formal regulations and standards as well as the need to establish rules around fault between the car and the vehicle occupants. Some candidates suggested that the insurers should stop driverless cars as it is a threat to the industry and were awarded no marks. The average mark for this part was 0.8/2.

Table – Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**40.0**	**60.0**			
Strong Pass	18.0	27.0	45.0%	6	5%
Pass	14.0	21.0	35.0%	20	18%
Slightly Below Standard	12.6	18.9	31.5%	8	7%
Below Standard	10.0	15.0	25.0%	25	23%
Weak	8.0	12.0	20.0%	19	17%
Showed Little Knowledge	1.0	1.5	2.5%	27	25%
Did Not Attempt	0.0	0.0	0.0%	5	5%
Maximum Mark	20.5	30.8			
Average Mark	10.0	15.0			
Standard Deviation	4.6	7.0			
Co-efficient of Variation	0.46	0.46			

The question concerned an actuary advising an insurance company at different stages of the takeover of an insurance company, which included advice on:

- Profit and loss analysis of target company
- Profit projection post-takeover
- Risk margin diversification post-takeover
- Implications of a legislation change for product liability

The question was quite difficult as it was relatively long and incorporated seldom-tested concepts on risk margins and a legislation change few candidates grasped the potential implications of. To make matters worse, many candidates exhibited poor exam technique in this question, such as ignoring information provided and not allocating time wisely, resulting in an overall poor performance for this question.

Part a):

Candidates needed to assess the takeover target's business plan for the coming year. To achieve full marks, candidates had to calculate the usual KPIs (loss ratio, expense ratio, etc.), recognise that there were some unusual movements in the ratios, and outline how they could investigate further. Several candidates instead chose to spend their time providing lists of points from book-work that, although important, were not what was asked for, and for which no marks were allocated. The average mark for this part was 0.8/2.

Part b):

Candidates were required to perform four steps: combine plans, assume and allow for some expense and cross-sell synergies, explain how their assumptions could be refined, and comment on the resulting volatility of the combined portfolio. Candidates generally dealt with the cross-sell aspect poorly, with some neglecting to make any allowance for the cross-sell synergy and many not providing how to refine their assumption. A common and significant error made was that candidates would allow for an increase in premium without a corresponding increasing in claims cost or expenses, thereby overstating profit. Poorer-performing candidates also missed marks for not noting the rather obvious reduction in profit volatility arising from the takeover. The average mark for this part was 1.2/4.

Part c) i):

Candidates were required to calculate the diversified outstanding claims liabilities including CHE and risk margin, and the diversification benefit. Assumptions around the underlying OSC distributions (lognormal) and formulae were provided, but candidates struggled with the lognormal calculations and in several cases used the normal distribution without justification or tried to justify it by quoting the central limit theorem or convenience, implying a weak understanding of basic statistics. The average mark for this part was 0.9/3.

Part c) ii):

This part was mostly bookwork, requiring candidates to identify that a risk margin correlation factor based on profit would be influenced by irrelevant factors like rate changes and expenses and that the CHE for a liability class of business would not likely be the same as for a property portfolio. Candidates were also asked to propose an industry approach and its drawbacks. Candidates were generally able to identify that both correlation and CHE were incorrect, but several struggled to justify why the correlation in particular was inappropriate. Many failed to take the hint to quote industry papers like the "Tillinghast paper" by Bateup-Reed. The average mark for this part was 0.8/3.

Part c) iii):

This part was also mainly bookwork, with candidates asked to respond to the company's CFO (who is familiar with the capital model) asking for more rigorous quantitative analysis of the risk margin. Candidates were generally able to point out the faults of more quantitative analysis but few were able to champion a more simple/qualitative approach. The average mark for this part was 0.4/2.

Part d):

The part required candidates to comment on the impact of a reform on underwriting profit. Better candidates took a more structured approach to answering the question, by referring to the plan in a) and going through each component. Most candidates were able to identify the potential for an increase in claim frequency offset by lower claims cost due to less legal fees paid. However, very few students utilised all the available information and most did not note that the company could vary premiums to increase profit or that reserves would be unaffected. Potentially due to time constraints, several candidates also did not clearly explain how their comment (e.g. "lower claim duration") would impact profit which lost them marks. Many candidates also did not recognise that legal fees are usually attributed to individual claims and thus are part of incurred claims, instead attributing the savings to CHE. The average mark for this part was 0.7/4.

Part e):

This part required candidates to describe ways to assess the impact of the potential change in claims cost prior to implementation, i.e. using data potentially currently available. Some candidates did not relate to the situation (or were just trying to get marks) and proposed solutions post-implementation e.g. monitoring which got no marks. Candidates also lost marks for not clarifying statements e.g. "analyse claims below common law threshold". The average mark for this part was 0.2/2.

Table – Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**40.0**	**60.0**			
Strong Pass	20.0	30.0	50.0%	1	1%
Pass	16.0	24.0	40.0%	21	19%
Slightly Below Standard	14.4	21.6	36.0%	5	5%
Below Standard	10.0	15.0	25.0%	42	38%
Weak	7.0	10.5	17.5%	16	15%
Showed Little Knowledge	1.0	1.5	2.5%	19	17%
Did Not Attempt	0.0	0.0	0.0%	6	5%
Maximum Mark	21.8	32.6			
Average Mark	10.9	16.4			
Standard Deviation	4.9	7.4			
Co-efficient of Variation	0.45	0.45			

This question was in relation to the establishment of an additional reserve to address the emergence of latent diseases claims emerging in respect of the use of Plead, a chemical that is not uncommon in paints. The question addressed the appropriateness of valuation methodologies, limitations in the information provided, understanding the volatility associated with latent diseases claims and exploring options raised by the Board in respect to the impact of the additional reserve to its operations.

Overall, it was felt that this question was not overly complex with most marks requiring knowledge and understanding or simple judgement. The performance on this question was quite poor with many candidates not answering the questions however part of this could be that this question was left until last and the candidates simply ran out of time.

Part a):

This part required the candidate to discuss why the PCE and PPCF methodologies were not appropriate for the valuation of Plead-related diseases claims under the circumstances and why the Bornhuetter Ferguson (BF) method is more favoured. Most candidates recognised the insufficient level of data but few linked this back to specifics of the PCE and PPCF models. Further, very few candidates recognised the utilisation of exposure in the BF method. The average mark for this question was 0.85/2.

Part b):

This part required the candidates to calculate the additional reserve for Plead-related claims. This question was poorly answered by the candidates. Despite being instructed to use the BF method, almost all candidates opted for alternative approaches which, given the circumstances, provided answers significantly different to the model solution – it was clear that most candidates have a poor understanding of the BF method. A common mistake for candidates was to assume that all IBNR claims at the balance date would be reported (and settled) at the same time, despite the statute of limitations which would effectively defer the reporting of the more recent accident periods. Another common mistake was to apply claims handling expenses to the net of reinsurance liabilities as opposed to the gross. The average mark for this question was 1.9/8.

Part c):

This part required the candidates to explain limitations in the adopted assumptions. It was clear that this question could have been worded better as many candidates interpreted this as the limitations in the assumptions they adopted from part (b) rather than the assumptions that were provided in the question. Marks were lenient and provided for well-constructed responses. The average mark for this question was 0.35/2.

Part d):

This part asked the candidates what investigations they would undertake to assist in calculating the risk margin for the Plead-related diseases provision. The question was well answered with many candidates recognising industry reports would be useful as well as the comparison to asbestos. The average mark for this question was 0.7/2.

Part e):

This part asked the candidates to respond to queries raised by the Board. Many candidates received marks for recognising that if the claims were all below the XOL deductible then the quota share was better than the XOL, but very few understood the implications of moving to a claims made policy. Many correctly identified that the investment strategy should change, but, but often this was without a full calculation of duration. Overall, this question was not well answered which could reflect many candidates running out of time. The average mark for this question was 1.7/8.

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

55 candidates enrolled this semester, with all of these sitting the exam.

It is proposed that 17 candidates be awarded a pass, which implies a pass rate of 31%. Table 1 shows the historical pass rates for this subject:

Table – Course Experience

SEMESTER	SAT	PASSED	PASS RATE
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 31% pass rate for this exam is lower than the 37% pass rate for the previous exam (Semester 2 2015) and is slightly lower than the historical average. Candidates generally seemed to have a solid grasp of the material. Better performing candidates were able to differentiate themselves through linking their knowledge to the context of the exam question and demonstrating their ability to apply judgment.

The examination structure was updated this semester, with the removal of the multiple choice section of the exam. The long answers were also intentionally structured to have one intense calculation question and two non-calculation questions as per the guidance of the Institute's Education Council Committee.

Results from the three marking pairs on the LAQs were submitted in time for results to be finalised, with regular communication between the examiners and markers helping to ensure a smooth marking process this semester.

2. Assessment

2.1. Overall Performance

The raw marks for this semester were slightly higher compared to last semester, reflecting that long answer question 2 was generally well answered by most candidates. It's also worth noting that the format of the exam has changed this semester, with the MCQ component no longer forming part of the examination, making this semester's and last semester's exams not directly comparable.

- The highest mark was 149.7, which was higher than last semester's 135.
- Online participation mark average of 8.8/10 was similar to last semester. It is pleasing to see candidates continue to make good use of the online learning resource for the course.

- LAQ1 proved to be a good differentiator of candidates, with better candidates able to demonstrate their ability to use the information presented in the question and apply judgment in their answers. The question drew on recent trends that have been observed in the NSW CTP market as well as the growing sharing economy and tested whether candidates could extrapolate the key issues that insurers needed to consider in the scenario.

- LAQ2 was generally well answered by the majority of candidates, having the highest pass rate of the 3 LAQs having a strong focus around knowledge and understanding rather than complex judgment. The question was set around the issues that need to be considered in managing a travel insurance portfolio, with most candidates able to put reasonable responses to this question.

- LAQ3 tested whether candidates were able to perform reinsurance related calculations for both surplus and excess of loss reinsurance structures for a property portfolio. It also tested whether candidates could apply judgment and consider the issues involved in allocating reinsurance costs. The calculation parts of the question were relatively well answered, although candidates could have performed better on the judgment parts.

2.2. Exam Question by Question Analysis

Table – Question 1

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**64.0**	**67.8**			
Strong Pass	39.5	41.8	61.7%	7	13%
Pass	35.0	37.1	54.7%	11	20%
Slightly Below Standard	31.4	33.2	49.1%	7	13%
Below Standard	27.0	28.6	42.2%	16	29%
Weak	23.0	24.4	35.9%	10	18%
Showed Little Knowledge	0.0	0.0	0.0%	4	7%
Did Not Attempt	0.0	0.0	0.0%	0	0%
Maximum Mark	41.5	43.9			
Average Mark	31.3	33.1			
Standard Deviation	6.0	6.3			
Co-efficient of Variation	0.19	0.19			

The overall pass rate for this question was 33%, the lowest of the 3 LAQs.

The question challenged candidates to use the information presented and apply judgment to the scenario at hand. Better candidates were able to apply their knowledge and understanding and combine this with the information in the question to formulate their answers.

Parts a) and b) both dealt with the issues associated with the recent emergence of new CTP claims, as a result of legal firms encouraging people who were previously involved in accidents to claim. Many candidates struggled to pick up on the likely characteristics of the claims and claimants involved in answering these two parts of the question.

In part c) most candidates were able to identify that it was necessary to project the various line items of the P&L to calculate the return on capital. Better candidates noted that it was also important to assess the likely impact on capital and insurance liabilities as a result of the emergence of the new CTP claims in assessing ROC. The best candidates picked up on issues around the need to consider prior year reserve movements and the fact that the 5% price increase wouldn't be fully earned over the next year.

Part d) required candidates to identify the likely reasons behind various policy lapse causes recorded and was well answered by most candidates.

The majority of candidates made a reasonable attempt at part e), with most able to provide a reasonable explanation of the difference between Defined Events and All Events covers. Better candidates identified that in deciding on an approach, CTP Inc could consider what had already been done in other jurisdictions and the fact that although All Events covers are easier to write, they are riskier as they are open to broader interpretation.

Part f) was also relatively well answered by most candidates, with most able to give a reasonable explanation as to the drivers of premium relativities between risk categories.

Candidates didn't perform very well in part g), with some candidates stating that ride sharing would be most analogous to metropolitan cars, rather than taxis or hire cars.

In part h) most candidates did reasonably well, making a reasonable attempt at identifying the pros and cons of extending existing coverage to include "occasional" ride sharing.

Part i) wasn't very well answered, with many candidates not mentioning the need to consider materiality in deciding what to include in the FCR and also missed the fact that CTP Inc was a mono line CTP insurer.

Part j) required candidates to draft relevant sections of an FCR for one of the 3 topics mentioned in the question. Candidates had a reasonable go at identifying the relevant sections of the FCR that needed to addressed, however better candidates also provided advice on the implications of material risks and made recommendations on how to deal with these risks.

Table – Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**44.0**	**46.6**			
Strong Pass	38.0	40.2	86.4%	5	9%
Pass	32.0	33.9	72.7%	29	53%
Slightly Below Standard	28.6	30.3	65.0%	6	11%
Below Standard	26.0	27.5	59.1%	7	13%
Weak	24.0	25.4	54.5%	4	7%
Showed Little Knowledge	0.0	0.0	0.0%	4	7%
Did Not Attempt	0.0	0.0	0.0%	0	0%
Maximum Mark	40.0	42.4			
Average Mark	31.7	33.6			
Standard Deviation	5.1	5.4			
Co-efficient of Variation	0.16	0.16			

The overall pass rate for this question was 62%, the highest of the three LAQs and substantially higher than the overall examination pass rate.

This question was focused on testing whether candidates could apply their knowledge and understanding to the pricing and underwriting issues faced by a travel insurer.

Part a) was answered well by most candidates, with the majority able to list the benefits included under a travel insurance policy and recognising that they are primarily short tailed in nature.

Part b) relating to the impact of exchange rate movements was also answered relatively solidly, with most candidates mentioning that exchange rate movements would likely impact claim costs for a travel insurer

Part c) was very well answered, with most candidates able to give reasonable points to explain the relative differences in underwriting performance metrics between individual and group travel policies.

In part d), better candidates were able to link their answer to the information provided in part c) and take account of the risk characteristics of the group policy being considered.

Part e) was answered reasonably well, although better candidates identified that it was important not to overreact to the initial information the group policy already paying out $10,000 in claims but rather look into the specific details behind the claims.

Most candidates answered part f) quite well and were able to link the experience on the group travel policy to operational risk management issues.

In part g) the majority of candidates could describe the general process for determining the ICRC for a portfolio, with better candidates also able to give 2 relevant scenarios that could be used to assess the ICRC in the context of a travel insurance portfolio.

Table – Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**62.0**	**65.6**			
Strong Pass	42.0	44.5	67.7%	9	16%
Pass	37.0	39.2	59.7%	12	22%
Slightly Below Standard	33.3	35.3	53.7%	2	4%
Below Standard	20.0	21.2	32.3%	20	36%
Weak	0.0	0.0	0.0%	12	22%
Showed Little Knowledge	0.0	0.0	0.0%	0	0%
Did Not Attempt	0.0	0.0	0.0%	0	0%
Maximum Mark	53.0	56.1			
Average Mark	30.4	32.2			
Standard Deviation	11.8	12.5			
Co-efficient of Variation	0.39	0.39			

The overall pass rate for this question was 38%, which was in between the pass rates for LAQs 1 and 2 and higher than the overall examination pass rate.

This question was designed to be calculation intensive and focused on whether candidates could perform reinsurance related calculations and apply judgment in recommending optimal reinsurance arrangements to an insurer.

Part a) was well answered with many candidates able to perform the necessary calculations to determine the retained and reinsured claims costs at different return periods.

Similarly, part b) was also well answered, with many candidates making a reasonable attempt at determining the reinsurance premium for each reinsured layer and calculating the reinsurer's expected loss ratio.

In part c) better candidates were able to explain that the insurer would pass on the expected net cost of claims plus the gross cost of reinsurance to its customers.

In part d) stronger candidates were able to explain that the insurer would want to use a bespoke allocation of reinsurance costs to avoid anti-selection and to charge each policy its fair share of reinsurance expense.

Most candidates were able to perform the required calculations in part e), however better candidates could more clearly articulate the reasoning behind their recommended allocation approach and the potential pros and cons of different approaches.

Part f) was a simple calculation question requiring candidates to calculate ceded premium on a surplus reinsurance basis. Most candidates earned at least partial marks for this.

Part g) was the least well answered part of this question and was a good differentiator of candidates. Candidates who attempted this part of the question were generally able to identify that the excess of loss arrangement was expected to produce higher underwriting results than the surplus arrangement. Better candidates also identified that the excess of loss arrangement had a wider range of outcomes than the surplus treaty and went further to say that maximising underwriting results wasn't necessary the best outcome for the insurer and that further work was needed to consider return on capital and the insurer's overall risk appetite.

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 / modelling 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.

1.2. Assessment

The assessment model is broken down into two parts:

Forum Participation 10%

Long Answer Question Exam 90%

1.3. Pass Rates

38 candidates enrolled this semester. Of these, 2 withdrew and 2 did not present, leaving 34 sitting the exam.

It is proposed that 4 candidates be awarded a pass, which implies a pass rate of 11.8%. Table 1 shows the historical pass rates for this subject:

Table – Course Experience

Semester	Sat	Passed	Pass Rate
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%
C5A Semester 2 2011	26	16	62%
C5B Semester 1 2011	16	6	38%
C5A Semester 2 2010	38	20	53%

The 11.8% pass rate for this exam is below the 20% pass rate for C5A examination in 2015 Semester 2, and also lower than the pass rates for the previous C5B exam (Semester 1 2015) and the historical average. 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 addition, Question 1 of the 2016 C5B examination has a strong emphasis on testing the partial differential equation approaches of derivative pricing theory, which has not been tested much in past 5B exams (i.e. any exam questions on this part of the syllabus would be more unfamiliar to students). While underlying concepts are mostly covered in the course materials, the level of difficultly of the mathematical questions in this exam was clearly too difficult for most candidates.

2. Assessment

2.1. Overall Performance

The overall online forum participation has been high generally, with most candidates obtaining maximum allocated marks. Only a very few candidates choose to forego these "easy" marks. However, as consequence of this, the online participation marks effectively had negligible impact on the overall ranking of the candidates.

The final examination, which contributed 90% to the overall grade of each candidate, was generally poorly attempted by the candidates. Most candidates struggled with the more mathematical / technical components of Questions 1 and 2, which focus on derivative theory using partial differential equations and risk neutral pricing respectively. Question 3, while less technical, focuses on (investment) operational risk management. This was not as well as attempted as the Examiners had previously hoped, which can be attributed to potentially:

- Lack of time by the time some candidates reached this part of the exam
- Operational risk is not a significant part of the C5B course, and therefore would have not been focused on by candidates
- Parts of the question were poorly worded, leading to potential misinterpretations on behalf of the students

Pass marks for Questions 1 and 2 were reduced respectively by 3.6 (weighted) marks. Without this adjustment, only 3 candidates would have been clear passes, while the rest would have been clear fails. The adjustment resulted in 4 clear passes and 3 borderlines. However, a further adjustment was made to the marks of Q1 (e) for candidate 161388, whom had been incorrectly awarded too many marks for this question. This resulted in the candidate being relegated to a "Borderline".

Overall, the Examiners require, at minimum, that a pass candidate to have demonstrated sufficient understanding of the key concepts in at least one of Q1 and Q2. Failing to do this resulted in a fail in most cases.

The aggregate performance of the students in this exam was very low. In retrospect, it is acknowledged that this was a very difficult exam, and the technical level of difficulty of the exam was high. As a consequence, the Examiners lowered the cut off pass mark level for Questions 1, 2 and 3 to well below 50% of the raw marks allocated to the questions.

Most students failed the exam because they poorly answered both Question 1 and Question 2.

Question 1, worth 40 out of 100 marks, was a very difficult question with exam material that was clearly unfamiliar for most students. The question was on the topic of derivative valuation using the partial differential equation approach. It seems most students did not appear to be familiar with the material for answering this question, because many students skipped the majority of the technical question parts (which depended on multivariable calculus). Part of the problem was that this type of question has not appeared in past 5B exams, so it would have been an unfamiliar type of question for the students. Students also struggled to answer the question parts related to utility theory.

The level of difficulty of Question 2, worth 45 out of 100 marks, was also high. The technical (mathematical) question parts were predominately about using stochastic calculus in a multivariate context. This involved students using matrix notation to manipulate stochastic differential equations; most students found this very difficult to do under exam conditions. Most previous 5B questions on stochastic calculus have been set using univariate stochastic processes which are obviously easier to work with. It seems that time may have also been an issue with students in answering this question.

2.2. Exam Question by Question Analysis

Table – Question 1

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**80.0**	**72.0**			
Strong Pass	41.0	36.9	51.3%	2	6%
Pass	30.4	27.4	38.0%	3	9%
Slightly Below Standard	27.4	24.6	34.2%	3	9%
Below Standard	25.0	22.5	31.3%	2	6%
Weak	13.0	11.7	16.3%	13	38%
Showed Little Knowledge	1.0	0.9	1.3%	9	26%
Did Not Attempt	0.0	0.0	0.0%	2	6%
Maximum Mark	47.0	42.3			
Average Mark	19.9	17.9			
Standard Deviation	11.3	10.2			
Co-efficient of Variation	0.57	0.57			

Candidates generally performed poorly on this question, with a pass rate of 15%.

The question is about the application of the partial differential equation (PDE) approach to valuing/pricing derivatives. The mathematics is relative heavy throughout the question. Because of the heavy level of mathematics, candidates either knew what to do or didn't. There was little scope for candidates to demonstrate their knowledge because of this. Markers were therefore more generous in giving part marks, reflecting the difficulty of this question.

For parts e) to f), the marks of the candidates deviated significantly. Candidates either did very well or poorly. There were very few that found the middle ground. The formulae and the mathematics appear to have thrown off many of the candidates. Another key observation is that very few candidates gave reasonable answers to parts g) and h), which are applied questions related to the real world (and less technical than the preceding parts).

Clearly the 5B material related to PDEs is not well taught or understood. Judging by the results, a review of this part of the 5B syllabus is warranted. It is noted that PDE type questions have rarely appeared in previous 5B exam questions, so their unfamiliarity to the candidates in this exam is likely a large factor as to the poor performance for this question.

Comments on each part of Q1:

Part 1 a):

This part asked students describe how the real world log stock price SDE comes about. This is easily shown by applying Ito's Lemma to $\log(S_t)$. It is a bookwork question. Students found this part straightforward to answer.

Part 1 b):

This part involves another application of Ito's Lemma, as well as understanding the question in order to make some appropriate substitutions of variables (e.g. recognising that $\mathrm{dH} = \mathrm{rH}\,\mathrm{dt}$). A solid understanding of basic calculus is necessary to answer this question, which is all very within reason for the syllabus of course 5B. This question part was reasonably well answered by students.

Part 1 c):

Students were asked to show how function G satisfied a partial differential equation.

Unfortunately, this question was not well worded in terms of what the student was supposed to do in order to reach the final answer. The solutions to this paper show the intended approach to reach the final answer. This misunderstanding was taken into account when marking students' responses. Many students used different plausible approaches to reach the answer for this question part – and they were awarded potentially full marks if their approach was sound.

This part was very poorly answered, with many students being unable to make any reasonable points. Part of the poor performance may be due to the topic of partial differential equations (PDEs) for pricing derivatives being given only a small exposure/emphasis in the 5B syllabus (the 5B syllabus focuses on the Monte Carlo and binomial valuation methods for pricing derivatives, which arguably reflects the valuation methods most used by actuaries in practice).

Part 1 d):

This part asked students to show how another partial differential equation was satisfied for a probability density function. Using the hint in the question facilitated reaching the required answer. If students understood how to use the hint, the remainder of the solution should in principle be easy to obtain.

This part was challenging. Most students were unable to make any reasonable points toward reaching the desired final solution. The difficulty of this question part was taken into account in setting a lower pass rate for this question.

Part 1 e):

This part is similar to part c) and d), in that students were asked to show how another PDE is satisfied. This part should have been fairly easy to answer (compared to part d)), and students should have spent some time focusing on their response here as 9 out of 40 marks were awarded for this question part. Students were expected to clearly derive each of the partial derivatives (show differentiation inside the integral). The marks allocated to this question reflected the time consuming nature of completing this part.

Student responses to this question were mostly "binary" in the sense that either they understood the part and received most marks, or they did not understand what was required and received 0 or very few marks. The distribution of marks for this question as a result peaked at 0 with a thick tail to the right toward the max of 9 marks.

Part 1 f):

This part asked a question related to utility theory, which is outside the core of the 5B syllabus. Students needed to understand how to set up the Lagrangian and solve to obtain the solution.

This part was very challenging for most students. This is not surprising, given that the application of utility theory is not in the core 5B syllabus (however, students were previously exposed to utility theory in the Part 1 Syllabus of the actuarial education). The difficulty of this question part was taken into account in setting a lower pass rate for this question.

Part 1 g):

Students were asked to explain how an investment strategy could be implemented based on the results of the previous question parts. This was designed to be an applied question part, testing whether students understood how to fit the pieces together.

The performance for this question part was weak. Most students were unable to put into words a clear explanation of how the pieces come together. Generic responses were not awarded marks.

Part 1 h):

Students were asked to discuss whether the investment strategy discussed in this question was feasible in practice, and to highlight any modifications (or shortcomings) that are relevant. This question part was not nearly as technical as earlier parts. Again, this is another applied question part relating to the "bigger picture".

This part was answered poorly. Some students provided very solid answers, but most gave very weak or generic responses. Even if students could not answer the earlier technical parts of this question, they should have been able to grasp what this question part was asking, and to provide some sensible responses (8 out of 40 marks were given to this question part, so students should have focused their energy on this part). Many students avoided discussing the issues related to the utility model and difficulties associated with it (e.g. model and/or parameter estimation).

Table – Question 2

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**90.0**	**81.0**			
Strong Pass	40.0	36.0	44.4%	3	9%
Pass	30.4	27.4	33.8%	3	9%
Slightly Below Standard	27.4	24.6	30.4%	1	3%
Below Standard	18.0	16.2	20.0%	17	50%
Weak	12.0	10.8	13.3%	4	12%
Showed Little Knowledge	1.0	0.9	1.1%	5	15%
Did Not Attempt	0.0	0.0	0.0%	1	3%
Maximum Mark	52.0	46.8			
Average Mark	22.6	20.3			
Standard Deviation	10.8	9.7			
Co-efficient of Variation	0.48	0.48			

Candidates struggled with Question 2, given the pass rate of 18%.

Question 2 tests the understanding of the candidates in core aspects of the course including risk neutral pricing, derivative payoff recognition and practical considerations of hedge implementation in the context of a multi-asset multi-currency investment problem.

Across the board, students struggled with this question. In particular, quite a number of students did not attempt the more technical parts of (g), (h) and (l), where students are asked to perform risk-neutral transformation in multi-dimensions with Girsanov's Theorem. Most students did not produce the number of points needed to obtain close to full marks in parts (i) and (j), which may be partially attributed to the poor wording of these questions. Very few students attempted to calculate the features of the hedge in (k) apart from the number of units of foreign and domestic put options.

Comments on each part of Q2:

Part 2 a):

Students were asked to explain what is a martingale.

Students performed well in this part of the question. The question was straight-forward bookwork question. However, many students left out that the expectation of the process Z_t is finite and therefore did not receive full marks for the question.

Part 2 b):

Students were asked to explain concepts related to arbitrage free pricing and risk neutral measures.

Most students could explain what the "risk neutral measure" means and the better students explained why S_t/B_t should be a martingale under the Q measure. Many students understood that if the risk free rate is stochastic then S_t/B_t cannot be priced. However, very few students could explain what complications arise under this situation.

Part 2 c):

This part of the question was less abstract and requires candidates to spell out payoff functions for different type of options.

Most students did well in this question and could write the payoffs for the 4 options.

Some students misunderstood the question and attempted to write the analytical formula for the 4 options. Some students struggled with writing the payoff for the lookback option and down-and-out option.

The better students could explain why the price neutral valuation is $E_Q[R_t/B_t]$.

Part 2 d):

This sub-question requires the student to explain the interest rate parity using arbitrage free pricing argument.

This question was not well answered, particularly concerning why $r_f + \mu_x = r$. Quite a few students noted that the relationship is purchased power parity which is not the same as interest rate parity.

Part 2 e):

The part of the question tests whether the candidates understand the premises and limitations of applying the CMG or Girsanov's Theorm to obtain a risk-neutral measure for the stochastic processes.

This question was not well answered. Only the better candidate noted the technical conditions of the CMG Theorem such as the covariance matrix needs to be invertible.

Part 2 f):

This part of the question asks the candidates to describe three payoff functions concerning both foreign equity (and exchange rate). In addition, the candidates were asked to identified the quanto option and describe any model complications for such options.

This question was well answered with most students were able to describe the three options. The common mistake was to say the second option is the quanto instead of the third option. Most students could not explain how a quanto is different in terms of modelling from the others.

Part 2 g):

Part g) involves applying the Girsanov's Theorem in a more appropriate manner to obtain the risk neutral process for both the domestic and foreign equity processes. Some mathematical manipulations on behalf of the candidates are required.

This question was not well answered with a number of students skipping this question.

Part 2 h):

Part h) requires students to write out the payoff function for an option on a portfolio of domestic and foreign assets. In addition, candidates are asked to explain how to model the option using g).

Despite the question being fairly straightforward in the Examiners' minds, it was not well answered with very few students being able to explain how to formulate a price for the put option.

Part 2 i):

The questions tests candidates' understanding of pros and cons of different levels of hedging. In particular, students are expected to understand benefits of diversification with overlay hedge. However, the Examiners feel the question was not well worded.

This question was not well answered. The better students provided discussions of granular hedges versus an overall hedge.

Part 2 j):

This is another practical question, where candidates were asked to compare between using options and stock / futures for hedging. In addition, students were asked to compare the merits of in house implementation of the hedge strategy, outsourcing and simply buying options. However, the Examiners feel the question was not well worded.

This question was not well answered with students taking a position without justifying why they took a position. The better students provided reasons why they preferred agent or principal and why they preferred stocks or options.

Part 2 k):

The question requires candidates to perform a simple set of mathematical calculations to implement delta hedges for both domestic and foreign equity exposure on a portfolio, using put options.

This question was not well answered. Most students could answer the number of units of foreign and domestic put options required. The better students describing the features of the greeks.

Part 2 l):

The question has a very practical consideration, where attrition or lapse is incorporated into the modelling. The question asks students to describe the modeling process with the inclusion of such dynamic attrition. For students with experience in variable annuities, this would be a very straightforward question.

This question was not well answered with very few students attempting the question.

Table – Question 3

	Marks Required	Weighted Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Total Marks Available	**30.0**	**27.0**			
Strong Pass	16.0	14.4	53.3%	1	3%
Pass	12.5	11.3	41.7%	8	24%
Slightly Below Standard	11.3	10.1	37.5%	2	6%
Below Standard	8.5	7.7	28.3%	12	35%
Weak	5.5	5.0	18.3%	5	15%
Showed Little Knowledge	1.0	0.9	3.3%	5	15%
Did Not Attempt	0.0	0.0	0.0%	1	3%
Maximum Mark	18.0	16.2			
Average Mark	9.3	8.4			
Standard Deviation	4.0	3.6			
Co-efficient of Variation	0.43	0.43			

Candidates performed relatively well on this question in comparison to the previous two, with a pass rate of 27%.

Question 3 is an application type question, and stronger candidates tended to articulate and present ideas more logically and clearly, especially in part (e). Question 3 was designed to be a lighter non-technical question, in contrast to Questions 1 and 2 which both had highly technical question parts.

The level of difficulty of this question was, in the opinion of the Examiners, lower than the previous two questions. However, most students did not provide clearly expressed answers, and the performance overall by the candidate pool for this question was lower than expected.

The reasons for poor performance include:

- Arguably, some questions parts which could have been worded more clearly;
- Not all question parts were specifically asking for a certain answer (e.g. part (e) had a wide scope for providing reasonable answers), and perhaps as a result, many students gave very short, vague answers that did justify being given full marks for the question part (again part (e) in particular).
- Possibly, a lack of time left in the exam, as questions 1 and 2 were technically demanding and time consuming. Nevertheless, students should use good time management in the exam to allow sufficient time to reasonably answer all questions, as no doubt each question in a Part 3 exam will contain some "easier" question parts that are low hanging fruit not to be missed.

Comments on each part of Q3:

Part 3 a):

Students were asked to identify risks in the context provided by the question. Little technical knowledge of 5B was required to answer this part, but students had to identify the risks as they related to the context of this question to be awarded marks. This part was not answered well overall. Weaker students offered vague answers, often unrelated to the context of the question. Stronger students identified risks within the context provided.

Part 3 b):

Students were asked to identify weaknesses in the framework provided in the question. Candidates who scored higher marks briefly described methods for assessing the operational risks, and recognized the weaknesses of the methods. Students were given flexibility in answering this question, as long as their answers were applicable to the question.

Part 3 c):

Students were asked what expertise a quantitative analyst brings, in the context of this question. Students were given flexibility in answering this question, as long as their answers were applicable to the question. Well answered overall.

Part 3 d):

This part asked to discuss the merits of VaR vs other risk metrics in the question context. This type of question has appeared several times in previous 5B exams. It was well answered.

Part 3 e):

This part asked the students to discuss the design of a reporting system which could assess the risks affecting the profitability of the bank in both the short and long term, taking into consideration issues relating to the modeling complexity of financial derivatives. The part gave students scope in their responses, but the responses had to be relevant to the question, and touch on key points as outlined below.

This part was also designed to test the students' communication skills by asking them to draft a response in a formal report format, within reason, given the time constraints of the exam. Specifically, abbreviated responses were perfectly acceptable, but some effort that a report format was intended, such as a title and a signoff, was also desirable. An ideal answer would have logical and coherent responses to the issues raised in this question, which management of the organization (i.e. less technical individuals) could digest.

Differentiators for strong and weak papers, as judged by the markers, were:

1) The ability to recognize the risks are interconnected;
2) Understanding of the first and second order Greeks for assisting the risk reporting and that these are short term/point in time measures only;
3) Recognising the challenges faced for the long term profitability assessment and the ability to suggest alternative solutions.

Overall, this question part was not well answered.

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 comprised:

Forum Participation 10%

Long Answer Question Exam 90%

1.3. Pass Rates

18 candidates enrolled this semester, of whom 1 candidate withdrew and 17 sat the exam.

It is proposed that 7 candidates be awarded a pass, which implies a pass rate of 41%.

Table – Course Experience

GRIS	Course A Semester 1			Course B Semester 2		
Year	Sat	Passed	Pass Rate	Sat	Passed	Pass Rate
2016	17	7	41%			
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 recommended 41% pass rate for this semester is in line with the average for this subject whilst I have been chief examiner (42%) and slightly lower than last year, which included the same examiner team (48%). It is noted that the small numbers sitting this course can give rise to statistical fluctuations. Also the pass rate tends to be higher overall than the other subjects, which I surmise reflects a higher proportion of practitioners.

2. Assessment

2.1. Overall Performance

Overall performance was slightly disappointing and weaker than expected in an exam that was relatively straightforward and highly prescriptive in parts, essentially guiding candidates along the desired path to the model solution.

2.2. Exam Question by Question Analysis

Table – Question 1

Total Marks: 34	Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Strong Pass (A)	27	79%	1	6%
Pass (B)	22	65%	8	47%
Slightly Below Standard (C)	16.75	49%	5	29%
Weak (D)	14.5	43%	2	12%
Showed Little Knowledge (E)	4	12%	1	6%
Fail (F)	1	3%		
Maximum Mark	27			
Average Mark	20.8			
Standard Deviation	3.8			
Coefficient of Variation	0.18			

This question required candidates to confirm and prepare a report on the results of a relatively simple funding valuation and scenario analysis.

As the question was straightforward and somewhat prescriptive in its presentation, the markers commented that it was difficult to differentiate candidates. This was reflected in a cluster of candidates around the pass mark. I asked the markers to concentrate on candidates around the pass mark and to agree on a pass/fail recommendation for each candidate with reasonable justification. The subsequent iteration of the spreadsheet was detailed and the analysis of candidates around the pass/fail threshold was robust.

Notwithstanding the cluster remained apparent, the results of this question were highly correlated to the final course outcomes. This may suggest that outperforming candidates were able to differentiate themselves on the whole even when differentiation was difficult.

The pass mark and the pass rate were slightly disappointing and lower than expected for a straightforward question.

Very few candidates provided a multi-variable scenario as anticipated in the model solution; almost all candidates provided scenarios with changes to one assumption only. This made the question easier than intended and should have improved the pass rate.

1 candidate was flagged by the markers for serious misunderstanding for a fundamental error in one of their models. Upon review the examiners determined this did not constitute serious misunderstanding but rather was simply a wrong application.

Table – Question 2

Total Marks: 34	Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Strong Pass (A)	27	79%	1	6%
Pass (B)	20.75	61%	7	41%
Slightly Below Standard (C)	18.75	55%	4	24%
Weak (D)	12.75	38%	4	24%
Showed Little Knowledge (E)	7	21%	1	6%
Fail (F)	1	3%		
Maximum Mark	30.25			
Average Mark	20.5			
Standard Deviation	4.9			
Coefficient of Variation	0.24			

This question required candidates to consider an 'appropriate' level of tax concessions available within an Australian superannuation context. It was timely given the changes announced in the Budget. Despite the number of sub-parts, it was a good differentiator, particularly parts (d) and (e), which required judgement supported by rational argument and allowed stronger candidates to outperform.

Part (a) sought a description of tax treatment for a new contribution while it remains in the superannuation system, ie from contribution to withdrawal as an account-based pension after retirement and throughout the intermediary phases. This is fundamental knowledge and should have been handled easily by all candidates.

Part (b) sought explanation for the existence of contribution caps.

Part (c) sought comparison of the advantages and disadvantages between the (then) current system and an alternative approach of lifetime caps. Coincidentally a lifetime cap was announced in the Budget after the exam paper was set.

Part (d) sought consideration of whether a lifetime cap should be (relatively) high or low.

Part (e) sought an argument as to whether lifetime caps should be implemented in favour of the (then) current system.

Better responses considered Division 293 tax on top of the other items in the model solution.

Marks were awarded for answers based on current limits or on the limits proposed in the Budget announcements.

Some candidates were confused between concessional and non-concessional caps, particularly in relation to lifetime caps, since the question referred to a lifetime cap for concessional contributions while the Budget proposed a lifetime cap on non-concessional contributions.

1 candidate demonstrated serious misunderstanding by stating that "no tax is deducted from the pension the retiree receives as the balance are [sic] accumulated on after-tax contributions". As the question related to an employer contribution, this part of the response did not make sense. Also in part (d) the same candidate stated "I am willing to contribute $1 million", which appeared to confuse concessional with non-concessional, as it is extremely unlikely that someone would be able to pay $1 million in concessional contributions from pre-tax income in a single year.

Table – Question 3

Total Marks: 30	Marks Required	% of Total Marks	Number of Candidates	Proportion of Candidates
Strong Pass (A)	21	70%	4	24%
Pass (B)	18	60%	4	24%
Slightly Below Standard (C)	16.25	54%	4	24%
Weak (D)	12	40%	4	24%
Showed Little Knowledge (E)	8	27%		
Fail (F)	1	3%	1	6%
Maximum Mark	26			
Average Mark	17.6			
Standard Deviation	4.5			
Coefficient of Variation	0.26			

This question required candidates to prepare a report on the impact of sequencing risk and how product changes can mitigate the risk.

Most candidates were able to produce a sensible 20-year projection.

Most candidates understood the concept of altering asset allocation; however, they struggled to find 2 separate asset allocation alternatives to maintain a consistent allocation. Many candidates mentioned being more conservative and several mentioned the bucket approach, although in most cases the bucket approach does not answer the question and will actually increase sequencing risk.

Many candidates struggled with the impact of drawdown on sequencing risk. Some candidates outlined variable drawdown strategies depending on returns, which seems reasonable, although this strategy was not included in the model solution.

Most candidates produced a graph of some description, although these were often incomplete, perhaps due to the difficulties encountered as above. There was some confusion about whether the graph should include average or sequenced returns for the alternatives – both were considered acceptable.

2 candidates demonstrated serious misunderstanding by suggesting that the Trustee should attempt to 'time' the market to reduce sequencing risk.

2 candidates demonstrated serious misunderstanding by the incorrect application of a post-retirement 'lifecycle' strategy to reduce sequencing risk (ie they suggested starting with a more aggressive portfolio, which increases sequencing risk). 1 of these candidates made further statements regarding growth asset allocation and drawdown that also constituted serious misunderstanding.

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 3 non-traditional topics: Banking, Health or Environment-Social-Governance (ESG). One-third of the students were randomly allocated to each topic. It is worth 20% of the final mark.
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

80 candidates completed the course. Of these, it is proposed that 45 be awarded a pass, representing a **pass rate of 56%.** Although this is slightly lower than in recent semesters, the pass rate has been surprisingly consistent over time.

Table – Recent Course Experience

Semester	Sat	Passed	Pass Rate %
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
Semester 2 of 2011	87	48	55
Semester 1 of 2011	79	47	59
Semester 2 of 2010	102	56	55
Semester 1 of 2010	97	57	59

1.3. Candidate Numbers

A total of 80 candidates were originally enrolled for the CAP course in Semester 1 of 2016. 46 candidates attended the 4-day CAP residential course at MGSM, being all those sitting CAP for the first time. In addition, 3 repeat candidates attended a half-day as a refresher, and all 3 subsequently passed, which sounds like a good marketing angle!

The candidate numbers and results can be summarised as follows:

	Post-Course Assignment only	Case Study Exam only	Both	Total
Originally enrolled	0	0	80	**80**
Withdrawals	0	0	0	**0**
Absent	0	0	0	**0**
Presented	0	0	80	**80**
Passed	0	0	45	**45**
Failed	0	0	35	**35**

Table: Number of CAP Attempts

The results by number of attempts are as follows:

Attempt	Presented	Passed	Pass rate
1	46	29	63%
2	19	7	37%
3	11	7	64%
4	2	1	50%
5	1	0	0%
6	1	1	100%
Total	**80**	**45**	**56%**

The 5-time failure was a very clear failure in Life and barely pass standard on Assignment. The 4-time failure was a very clear failure in General. We suggest that both these candidates would benefit from some individual counselling and/or tutoring.

A summary of attempts by Exam topic (below) shows no major patterns other than the slightly higher pass rate (as above) of first-time candidates and a reflection of past low pass rates for Life Insurance.

Topic	Pass	Fail
ERM	1.4	1.6
GI	1.7	1.8
GRIS	1.4	1.8
Invest	1.7	
Life	1.9	1.9
Total	1.6	1.8

Table: Analysis by Topic

The analysis by chosen Exam Topic is as follows:

Exam Topic	Candidates	No. of passes	Pass rate
ERM	13	8	62%
GI	28	16	57%
GRIS	9	5	56%
Invest	3	3	100%
Life	27	13	48%
Total	80	45	56%

As in several recent semesters we are again disappointed with the relatively low pass rate in Life Insurance.

Table: Analysis by Examination Centre

The results by examination centre were as follows:

Centre	Presented	Passed	Pass rate
Canberra	1	0	0%
Hobart	1	1	100%
Melbourne	26	11	42%
Sydney	43	29	67%
Subtotal Australia	**71**	**41**	**58%**
Hong Kong	1	0	0%
Malaysia	3	2	67%
London	2	1	50%
Singapore	2	0	0%
Toronto	1	1	100%
Subtotal Overseas	**9**	**4**	**44%**
Total	**80**	**45**	**56%**

The number of overseas candidates presenting has remained low, with none at all from New Zealand this semester. In contrast to last semester, the Overseas pass rate was lower than Australia's. Like last semester, Sydney outshone Melbourne.

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 3 non-traditional topics (Banking, Health, ESG), distributed after the 4-day residential course, for completion within 2 weeks. One-third of the students were randomly allocated to each topic, albeit with a check that repeat candidates are not allocated to the same topic 3 times in a row. The Assignment is worth 20% of the final mark. The result and feedback were supplied to candidates 1 week prior to the Exam.
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. Preparation of Case Studies

Case studies were prepared by the Course Presenters in the 8 topic areas listed below. Each was designed to be completed within 8 hours under exam conditions, even though the 3 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	David Service
Banking	David Service
Environment	Naomi Edwards
ERM	Bruce Edwards
Life Insurance	David Service
Investments	David Service
GRIS	Julie Cook, Minjie Shen
General Insurance	Colin Priest

Marker 1 roles for Banking (Bruce Thomson), Life Insurance (Peter Martin) and Investments (Aaron Bruhn) freed up David Service to be Marker 2 for those topics. Bridget Browne marked ERM and will take over that full author/presenter/marker role from semester 2. Bruce Thomson was Marker 2 for Health, but Andrew Gale (Melbourne) has been recruited as Health presenter in semester 2 so that David Service can be Marker 2 for all topics.

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 35% to 80% (ignoring 1 candidate given 20% for an incomplete report), with an average of 58%. 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.

3.1. Banking

The Banking case study required candidates to advise a government on the best method of increasing the funding for its Affordable Housing Lending Authority. Candidates had to consider government and/or private funding, costs, defaults and the likely impact of a guarantee.

The question was generally answered satisfactorily, but most candidates' lack of broad business and political experience was apparent. Banking was used as the base topic with no scaling. The other topics' marks were scaled to have a similar pattern to Banking.

3.2. ESG

The ESG case study required candidates to advise a fictional government about privatising its "poles and wires" electricity distribution network. Faced with a rapidly increasing use of solar panels and an imminent improvement in battery technology, maximising value would depend on attractive pricing structures and regulatory changes. Valuing the entity had to consider the great uncertainty in future cash-flows.

The question was a very good discriminator, with a wide spread of raw marks. After truncating the extremes in line with Marker 2, the scaling chosen was to subtract 5 marks from raw scores of 55 and above.

3.3. Health

The Health case study required candidates to advise a fictional government on whether to allow private hospitals to set up in the country. In addition to advantages and disadvantages, a key issue was the country's culture of equity for all citizens. Although Australian data could be used for illustration, weaker students went too far in assuming that everything would be identical to Australia.

Again the question was a good discriminator, with a wide range of marks. The scaling adjustment was to add 5 or 4 marks to nearly all raw scores.

4. Exam results

4.1. ERM

The ERM Exam required candidates to prepare a pro bono report for a friend working in the Disaster Risk Financing and Insurance unit of the government of a small South Pacific island nation. It was to address:

- managing the financial aspects of its natural disaster risk
- prioritisation of various proposed methods of financing and insurance
- estimation of the average annual claims cost due to natural disasters above certain thresholds
- a proposal to build a rugby stadium.

4.2. GRIS

The Exam for Global Retirement Income Systems required candidates to provide advice to the trustee of a superannuation fund considering implementing a range of new features. The key to the question was to identify and propose solutions that adequately dealt with the various risks associated with each of the features.

4.3. General Insurance

The General Insurance exam required candidates to devise a strategy for a broker transitioning to a new remuneration environment that allows profit share arrangements, and in which its three existing insurers are proposing different profit share structures.

4.4. Investment

This case required candidates to design a low-volatility investment product with a guarantee related to an economic indicator.

4.5. Life Insurance

The Life case required candidates to develop and justify a lifetime annuity price for a new and price-sensitive market where special deals and non-standard marketing is being suggested.