2012 PART III EXAMINATIONS

Subject Title: **C2B Life Insurance (longer answer component)**

Date: **Monday, 22 October 2012**

Time: **1:00 pm – 4:00 pm**

Time allowed: Three (3) hours including of reading time

Instructions: Type your answers to the longer answer component in a Word document and ensure that there is no data linked to spreadsheets. Only your Word document will be marked. Your Excel file should also be saved as a backup.

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Number of Questions: **Two** (2)

Question	Marks
1	30
2	30
Total	60

Candidates are required to answer ALL questions.
This paper has **eight** (8) pages (excluding this page).

COURSE 2B LIFE INSURANCE OCTOBER 2012 EXAMINATIONS

Answer two questions.

QUESTION 1 **(30 Marks)**

TS Life is a medium sized life insurer with a full range of life insurance products. You have just been appointed as the actuary responsible for all actuarial issues relating to capital management. You report to the Chief Actuary. TS Life conducts no business in the Shareholders Fund.

The target surplus policy has, up to now, been "ad hoc" with the amount decided annually by the Board on the basis of qualitative considerations.

The Board, encouraged by the Chief Actuary, has now decided to set an objective target policy on the basis of considered actuarial advice. The Chief Actuary has asked you to examine some specific issues in relation to the company's financial position:

A. Analyse the financial position of the company as at 30 June 2012 and comment on your key findings. (10 Marks)

B. What quantitative measure of target surplus would you recommend and what reasons would support your recommendation? Your recommendation is for a set of approaches and formulae which, when applied to the measures of business volumes and/or solvency and CAPAD calculations, will lead to an actual target surplus each year. A $ figure is not required for this part. (15 Marks)

C. Provide an estimate as at 30 June 2012, of the change in capital your recommendation would lead to, compared to the current capital. The estimate can be based on only the data provided. (5 Marks)

Your answers to all three parts are to be prepared as an actuarial briefing note for the Chief Actuary which can be used as the basis of the Chief Actuary's written advice to the Board.

Attachments (also shown below):

- Attachment 1: Balance sheet for 2012 & 2011. [2B LA Q1 Balance Sheet.xlsx].
- Attachment 2: Summary details of business volume by product with current target surplus and capital adequacy amounts for 2012 & 2011. [2B LA Q1 Business Details.xlsx]

Attachment 1: Balance sheet for 2012 & 2011

Balance Sheet as at 30 June 2012

	30-Jun-12	30-Jun-11
Assets	**$million**	
Cash	199.1	207.1
Investment Property	319.2	316.9
Listed Equities	2,598.3	2708.1
Government Bonds	1,453.6	1550.4
Other Investments	345.1	351.1
Owner Occupied Property	105.8	99.8
Outstanding Premiums	19.7	21.4
Other Assets	24.4	27.5
TOTAL ASSETS	5065.2	5282.3
Liabilities		
Share Capital	102.0	102.0
Retained Profits	16.4	19.5
Policy Liabilities	4873.8	5077.3
Outstanding Claims	18.7	21.3
Tax Provision	39.1	44.6
Other Liabilities	15.2	17.6
TOTAL LIABILITIES	5065.2	5282.3
NET ASSETS	118.4	121.5
DIVIDENDS PAID	6.1	0

Attachment 2: Summary details of business volume by product with current target surplus and capital adequacy amounts for 2012 & 2011.

Business Details as at 30 June 2012 (year Ending for New Business)

All amounts are $million
All data is net of reinsurance

Product	FuM New Deposits	FuM In Force	Annual Premium New Business	Annual Premium In Force
YRT			44.5	189.2
Disability Income			25.1	99.6
Ordinary Investment Linked	122.1	545.2		
Superannuation Investment Linked	1022.7	3,227.9		
Allocated Annuities	222.2	945.6		
TOTALS	1367.0	4718.7	69.6	288.8

	Policy Liabilities	Solvency Liabilities	CAPAD Liabilities	Current Target Surplus Addition to CAPAD
YRT	101.0	107.3	109.5	3.0
Disability Income	54.1	61.5	69.2	2.0
Ordinary Investment Linked	545.2	546.6	548.0	1.0
Superannuation Investment Linked	3227.9	3236.0	3244.1	4.0
Allocated Annuities	945.6	948.0	950.3	1.0
Resilience Reserve		14.3	16.9	
Expense Reserve		21.2	0.0	
Inadmissible Assets		0.0	0.0	
New Business Reserve		0.0	15.4	
TOTALS	4873.8	4934.9	4953.4	11.0

In Force & Liabilities as at 30 June 2011

Product	FuM In Force	Annual Premium In Force
YRT		224.3
Disability Income		104.2
Ordinary Investment Linked	576.5	
Superannuation Investment Linked	3,365.2	
Allocated Annuities	995.7	
TOTALS	4937.4	328.5

	Policy Liabilities	Solvency Liabilities	CAPAD Liabilities	Current Target Surplus Addition to CAPAD
YRT	121.2	129.3	132.0	3.5
Disability Income	56.6	65.1	73.5	2.0
Ordinary Investment Linked	549.9	555.3	557.9	1.0
Superannuation Investment Linked	3356.4	3364.8	3382.8	4.5
Allocated Annuities	993.2	995.7	1001.5	1.0
Resilience Reserve		16.1	19.5	
Expense Reserve		26.7	0.0	
Inadmissible Assets		0.0	0.0	
New Business Reserve		0.0	17.5	
TOTALS	5077.3	5153.0	5184.7	12.0

MARKING GUIDE: QUESTION 1

The question requires two tasks to be completed

[A] Target Surplus recommendation

[B] Quantitative estimate of the change in capital following from that recommendation.

In using the mark scale, markers need to ensure that students provide ALL the requirements for each mark range to fall in that range. Otherwise they drop to a lower range. The mark within the range depends on the quality of their answer within each 3 mark range.

Part [A]

This part requires an analysis of the financial position together with commentary on the key findings.

The relevant issues include

1. Profit for 2012 was 118.4-121-5+6.1 = 3.0 million
2. Dividend is 6.1m which is a payout ratio of 203%. This seems unusual when no dividend was paid last year even though target surplus was exceeded (but only by $2m)
3. This is a return on average net assets of 2.5%
4. Business volumes have declined. Candidate should quantify
5. Policy liabilities have reduced broadly in line with reduced business volumes. Candidate should quantify
6. The net assets in excess of CAPAD – Policy Liabilities + Target Surplus were 27.8 million in 2012 and 2.1 in 2011.
7. The apparent improvement was mainly due to a reduction in the difference between CAPAD & Policy Liabilities. If the same ratio as in 2011 was applied in 2012 the CAPAD would have been 23.5 million higher i.e. the “real” improvement was only 2.2 million.

The key conclusions are

1. Profitability is in adequate
2. The minimum capital amount is only just satisfied
3. The apparent improvement in capital position occurs because of a reduction in the relative level of CAPAD.

PART A APPROXIMATE MARKING SCALE

Marks	Requirements
8 – 10	Correctly identifies and calculates at least 6 of the 7 issues. Has commentary which follows directly from the issues. The commentary must be clear, logical and comprehensive.
5 – 7	Correctly identifies and calculates at least 4 of the 7 issues. Has commentary which follows from the issues. The commentary must be clear and logical.
3 – 4	Correctly identifies and calculates at least 2 of the 7 issues. Has commentary which is somewhat connected. The commentary must be satisfactory in parts.
1 - 2	Correctly identifies and calculates 1 or none of the 7 issues. Has commentary which has little connection.

The numbers which are presented must be calculated correctly. If not the inaccurate numbers do not count towards placing a student in a particular mark range. (So a candidate who identifies 6 points but only provides calculations for 3 would get a maximum of 4 marks)

Part [B]

This part requires students to

- provide a specific recommendation for a quantitative measure of target surplus, and
- Give reasons for that recommendation.

Note that a $ figure is specifically excluded. What is required is an approach and formulae which can be applied year by year.

The relevant considerations include

1. How much working capital is needed to ensure that no problems arise in respect to meeting CAPD if experience deteriorates?
2. What is a reasonable probability lower than the CAPAD rules for the company to adopt,
3. The probabilities of failure under the Solvency & CAPAD rules of 0.5% (1 in 200 years) and 0.25% (1 in 400 years),
4. If experience worsens then the CAPAD liabilities must also become higher – how does this interact with target surplus,
5. Are there interactions between business classes which act to reinforce negative outcomes,
6. To what extent does an increase in capital provide positive impact to the company's reputation

PART B APPROXIMATE MARKING SCALE

Marks	Requirements
13 – 15	Discuss at least 5 of the 6 considerations. Have the recommendation follow rigorously from the discussion. Provide a specific qualitative recommendation with reason and consistent with the reason. The argument must be clear, logical and comprehensive. All references to APRA requirements must be accurate.
10 – 12	Discuss at least 4 of the 6 considerations. Have the recommendation follow clearly from the discussion. Provide a specific qualitative recommendation with reason. The argument must be clear and logical and consistent with the reason. All references to APRA requirements must be accurate.
7 – 9	Discuss at least 3 of the 6 considerations. Have the recommendation follow from the discussion. Provide a qualitative recommendation. The argument must be satisfactory. Most references to APRA requirements must be accurate.
4 – 6	Discuss at least 2 of the 6 considerations. Have the recommendation related to the discussion in some fashion. Provide some recommendation. Some argument should be relevant.
1 - 3	Discuss less than 2 of the 6 considerations. Little of relevance in the recommendation or the arguments for it.

In each case either consideration 1 or 2 must be included. If not, the mark must drop to the next lower range even if all the other requirements are met.

Vague justifications of the recommendation should not be given any marks nor any credit in placing the student in a mark range.

Part [C]

This part requires students to provide an estimate of the capital required under the current target surplus and the recommended target surplus.

Capital Required = CAPAD liabilities + Target Surplus Addition – Policy Liabilities

For the current target surplus, this is

$$4977.8 + 11.0 - 4873.8 = 115 \text{ million}$$

Capital required under the recommended target surplus depends on that recommendation. The estimate must be consistent with the answer to Part [B].

The numbers provided by the student should be reasonable. Note that they are estimates based only on the data given.

While Part [C] clearly depends on the recommendation in Part [B] there should, as far possible, not be any double jeopardy. However, those who gained low marks in Part [A] are inevitably going to struggle in Part [C] because they will have little to work with.

The key issues in the marking are

Getting the current capital correct, and

Having a number for the new capital which is consistent with the approach and formulae recommended in Part [B].

Both of these correct = **5** marks.

Existing capital correct

But new capital not entirely consistent with Part [B] = **2, 3 or 4** marks depending on the degree of consistency

Existing capital correct

But new capital not consistent with Part [B] = **1** mark

Existing capital incorrect = **0** marks

QUESTION 2 **(30 Marks)**

CG Life is a large life insurance company with a material volume of capital guaranteed superannuation investment account business. The product was closed to new policies in 2006 but new deposits to existing policies continue to be accepted.

You are the actuary responsible for this particular product and its management. You are determining the crediting rate for this business for the year ending 30 June 2012.

A. Carry out an analysis of profit for this business and document the analysis. Set out the important conclusions to be drawn from this analysis. (15 Marks)

B. Set out with reasons the crediting rate you will recommend. (10 Marks)

C. How will the cost of applying this crediting rate be incorporated into the company's accounts? (5 Marks)

Attachments (also shown below)

- Attachment 1: Capital Guaranteed Superannuation Investment Product Description
- Attachment 2: Full accounting details for the capital guaranteed investment account business [2B LA Q2 CGAccountingData.xlsx].
- Attachment 3: Details of recent history of the crediting rates for this business including investment reserves [2B LA Q2 CGCreditingRateHistory.xlsx].

Attachment 1: Capital Guaranteed Superannuation Investment Product Description

Fees:

- 2% of all deposits
- Policy Fee of $35 p.a. increasing each year at the rate of increase in the Consumer Price Index
- 1.2% p.a. of Account Balances from month to month prior to adding investment earnings credited to the account (These are only added at year end or at withdrawal)

The crediting rate is guaranteed not to be lower than zero but, otherwise, it is determined by CG Life in its absolute discretion. However, no part of the investment income generated by the assets supporting the business can be retained by the company. Any which is not distributed to policyholders must be transferred to an investment reserve. Amounts may be transferred from the investment reserve and distributed to policyholders.

The product pricing was reviewed in 2006 as a result of the decision to close it to new policies. The key assumptions behind the pricing above were:

- Withdrawal rates 15% p.a. of account balances.
- The fees were sufficient to cover expenses and leave a pre-tax profit margin of 0.35% of account balances.

Attachment 2: Full accounting details for the capital guaranteed investment account business

CG Accounting Data for the year ending 30 June 2012

	$million
Account Balances 1 July 2011	1,050.0
Account Balances 30 June 2012 (before crediting)	970.0
Investment Reserve 1 July 2011	119.0

All the data below is for the year ending 30 June 2012

New Deposits	98.0
Withdrawals	178.0
Investment Earnings (after tax & inv. expenses)	16.8
Policy Fees	0.3
Expenses directly related to the CG business	10.1
Other expenses allocated to the CG business	3.2

Attachment 3: Details of recent history of the crediting rates for this business including investment reserves.

CG Credting Rate History

Financial Year	Account Balances Year End (After Crediting) $million	Crediting Rate %	Investment Performance (after tax & inv. Expenses)	Investment Reserve Year End $million
2005/06	1,435	9.0%	10.4%	137
2006/07	1,029	12.0%	13.5%	156
2007/08	956	5.0%	4.4%	150
2008/09	1,123	4.5%	-0.7%	96
2009/10	1,214	5.0%	6.5%	113
2010/11	1,050	6.0%	6.5%	119

Asset Allocation (%) Year End

	Equities	Cash	Govt Bonds
2005/06	25	20	55
2006/07	33	15	52
2007/08	28	25	47
2008/09	22	30	48
2009/10	19	38	43
2010/11	24	45	31
2011/12	22	50	28

MARKING GUIDE: QUESTION 2

The question requires three tasks to be completed

- Carry out an analysis of profits for the capital guaranteed investment business
- Determine a crediting rate for the year ending 30 June 2012 and set out the reasons for that crediting rate, and
- Show how the financial implications of that crediting rate decision will be incorporated into the company's accounts.

In using the mark scale, markers need to ensure that students provide ALL the requirements for each mark range to fall in that range. Otherwise they drop to a lower range. The mark within the range depends on the quality of their answer within each 3 (or 2) mark range.

Part [A]

This part requires students to

- carry out put an analysis of the profit of the CG business for the year ended 30 June 2012, and
- set out the important conclusions to be drawn.

The key numbers for the analysis are

1. Total fee income =14.38 million (12.12 + 1.96 + 0.30)
2. Total expenses = 13.30 million
3. Profit = 1.08 million
4. The profit = 0.11% of average account balances vs expected of 0.35%
5. Withdrawal rate was 17.6% of average account balances vs expected of 15%.
6. Actual investment rate was 1.66% of average account balances.

The important conclusions are

1. Profit is one third of that expected.
2. Expenses are clearly higher than expected
3. Withdrawals are above expected but the difference does not make a material difference to the profit shortfall
4. Investment performance is low compared to recent crediting rates

PART A APPROXIMATE MARKING SCALE

Marks	Requirements
13 – 15	Determine 5 of the 6 key numbers accurately. Draw the 4 important conclusions. Documentation is clear and follows directly from the analysis.
10 – 12	Determine 4 of the 6 key numbers accurately. Draw at least 3 of the important conclusions. Documentation is clear and follows from the analysis.
7 – 9	Determine 3 of the 6 key numbers accurately. Draw at least 2 of the important conclusions. Documentation is reasonable and has a connection to the analysis
4 – 6	Determine less than 3 of the key numbers accurately. Draw at least 1 of the important conclusions. Documentation has poor connection with the analysis.
1 - 3	Few accurate numbers and no relevant conclusions. Poor documentation.

Part [B]

This part requires students to

- Determine the crediting rate for the year ended 30 June 2012, and
- set out the reasons for that determination.

The relevant issues for the determination of the crediting rate include

1. The investment performance is low compared to recent crediting rates.
2. The difference is not necessarily all driven by market investment performance
3. With the product closed to new policies it is important to release the investment reserve at a pace which ensures that no material investment reserve remains as the portfolio declines to a small remnant.
4. There is sufficient investment reserve to release up to say $30 million without problems (but justification needed).
5. Releasing nothing is a very poor response.
6. Past practice has seen material releases when investment performance has been poor

There is a range of acceptable crediting rates. The key issue is the connection between the considerations and the recommended rate.

PART B APPROXIMATE MARKING SCALE

Marks	Requirements
9 – 10	Consider at least 5 of the 6 issues. A crediting rate which follows directly from the considerations. Documentation which is clear, logical and comprehensive.
7 – 8	Consider at least 4 of the 6 issues. A crediting rate which follows closely from the considerations. Documentation which is clear and logical.
5 – 6	Consider at least 3 of the issues. A crediting rate which is reasonably connected to the considerations. Reasonable documentation.
3 – 4	Consider at least 2 of the issues. A crediting rate which has some connection with the considerations. Some satisfactory documentation.
1 - 2	Little consideration of the issues. Poor documentation.

Vague justifications of the crediting rate, or no specific crediting rate recommendation, should not be given any marks nor any credit in placing the student in a mark range.

Part [C]

This part requires students to

- set out how the financial implications of this crediting rate will appear in the company's accounts.

The financial implications will see the following

- Policy liabilities increase by the amount of investment earnings credited to policyholder accounts.
- The investment reserve will be increased/decreased by the amount transferred to / from the investment reserve. The policies could be regarded as participating or non-participating. If the former the investment reserve will appear as Policy Owner Retained Profits, otherwise as Policy Liabilities.

PART C APPROXIMATE MARKING SCALE

2 marks for stating each of the transactions

Plus

1 mark for the accuracy of the descriptions

END OF PAPER