2016 PART III EXAMINATIONS

Subject Title:	**C2A Life Insurance** (long answer component)
Date:	**Thursday, 28 April 2016**
Time:	**10:00 am – 10:15 am** (Reading Time) **10:15 am- 1:15 pm** (Examination)
Time allowed:	Three (3) hours and fifteen (15) minutes including reading time.
Instructions:	Type your answers to the questions using Microsoft Word and ensure that there is no data linked to spreadsheets. You must submit your Excel answer file(s).
Number of Questions:	**Three** (3)

Question	Marks
1	30
2	30
3	30
Total	90

Candidates are required to answer ALL questions. This paper has seven (7) pages (including this page).

AS AT

QUESTION 1 **(30 Marks)**

MakeGood Life is an Australian life insurer that has been selling investment linked business for 30 years. In the last few years it has experienced the following problems:-

- Loss of knowledge and expertise resulting from staff turnover
- A history of unit pricing errors requiring compensation to be paid

Your role as Head of Operations involves overseeing the calculation of unit prices as well as administration and customer service.

It has just been brought to your attention that a dividend payment included in net asset value (NAV) on 01/04/2016 for $21m was manually entered incorrectly as $12m. Consequently the opening NAV on 01/04/2016 has been understated by $9m and unit prices from 01/04/2016 to 04/04/2016 for MakeGood's Equity fund have been calculated incorrectly.

Your actuarial analyst has collected the following information for you.

- Funds under management and unit prices

Date	Opening NAV in $m	Unit price
01/04/2016	198.3452	2.0012
02/04/2016	199.4553	2.0124
03/04/2016	204.4010	2.0623
04/04/2016	182.4351	2.0521

- All unit prices are calculated at the start of the day based on opening NAV.
- On 03/04/2016 unit holder X redeemed his account. His opening balance at 01/04/2016 was $20,435,200.
- There were no other deposits or withdrawals between 01/04/2016 and 03/04/2016.
- For simplicity assume no transaction fees, buy/sell spreads or tax.

AS AT

a) MakeGood Life intends to rectify this mistake by recalculating unit prices and restoring investors to the position they would be have been in had the error not occurred. In addition, MakeGood's standard practice for unit pricing compensation is to pay interest at a rate of 5% per annum effective.

Calculate the correct NAV and unit prices from 01/04/2016 to 04/04/2016 and determine the compensation payable to unit holder X as at 04/04/2016. State any assumptions that you make. **(15 marks)**

b) MakeGood Life's newly appointed Managing Director, who is also new to life insurance, says

"a history of unit pricing errors suggests an issue with people, processes or systems. I would like to explore the option of outsourcing policy administration and unit pricing to an external third-party provider."

Explain what risks relating to people, processes and systems MakeGood would be exposed to if it outsources its administration and unit pricing functions and describe what mitigating action could be taken to manage these risks? **(15 marks)**

END OF QUESTION 1

AS AT

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QUESTION 2 **(30 marks)**

BigLife is a large Australian life insurance company operating in the Australian individual risk protection business.

Recently it has been struggling to write business at a margin that meets its target requirements and, in the last few years, has lost market share. In order to continue to grow its business, Senior Management is exploring options for entering new markets.

As BigLife's Product Development Actuary you have been tasked with investigating this.

An analyst in your team suggests that BigLife starts to use digital (online) marketing to sell yearly renewable term (YRT) products direct to consumers.

"We could even develop an app so people can buy insurance using their smart phone or tablet!

We could target new families as they have an insurance need and probably don't have time to see a financial adviser anyway."

He also suggests that, given BigLife already sells retail term business, existing assumptions could be used for pricing the direct YRT product.

You would like to do some preliminary analysis to be used in a proposal for Senior Management.

To assist you, your analyst has prepared a simple projection model using BigLife's current assumptions and premium rates for retail YRT for a male, non-smoker age 40 years (see C2A_2016_S1_Q2a.xlsx).

He has also obtained the Actuaries Institute graduated mortality rates 2004-2008.

In addition he has gathered the following information for you in relation to this new direct YRT product.

- The product will be sold online only, with no adviser, telemarketing or call centre involvement.
- The product will be subject to short form underwriting covering smoker status, occupation, pre-existing conditions, recent medical investigations and family history. No medical test will be required.
- IT and other set up costs are estimated to be $1.5m.
- Annual advertising and marketing costs are estimated to be $0.5m.
- Sales targets per annum: 2,000 policies.
- Expected average sum insured: $250,000.
- The product is expected to be on sale for 5 years.
- No commission will be payable.

AS AT

a) Propose expense, lapse, mortality, investment return and risk discount rate assumptions for pricing this direct YRT product. Justify your recommendations and, where needed, explain why direct YRT assumptions should differ from retail YRT. **(15 marks)**

b) Modify your cashflow model to reflect these new assumptions and prepare a table that compares the present value of cashflows and the internal rate of return (IRR) for each step change in assumptions. Explain the impact of each assumption change on profitability. **(5 marks)**

You may assume that

- Premium rates remain unchanged from those used for retail YRT
- Premiums are received at the beginning of the year and claims are paid at the end of the year
- BigLife's hurdle rate for new products is 12%
- Adviser commission has been removed and the average sum insured has been updated in the model

c) Discuss options available to BigLife to address the profitability issues you identified in part b). **(10 marks)**

END OF QUESTION 2

AS AT

COURSE 2A LIFE INSURANCE **SEMESTER 1 2016 EXAMINATIONS**

QUESTION 3 **(30 marks)**

IndyGrp Life Insurance is a medium sized Australian life insurer that has been operating in the individual protection market for over 15 years. It entered the group life insurance market 5 years ago.

Being a relatively new player in the group market, IndyGrp's strategy is to focus on growth by increasing its market share. IndyGrp prices aggressively and quotes on a range of business. It has built a reputation in this market as an insurer that offers very competitive terms to blue collar workers, in particular miners.

You are IndyGrp's Experience Actuary and your role is to monitor experience for individual and group business.

Your actuarial analyst has prepared the following preliminary experience analysis for you in relation to IndyGrp's individual and group total and permanent disability (TPD) business.

Table 1. Actual to expected morbidity claims amounts - individual TPD business

2015	2014	2013	2012	2011
1.15	0.95	1.02	1.01	0.99

Table 2. Loss ratios – group TPD business

2015	2014	2013	2012	2011
1.25	1.07	0.98	0.96	0.88

Other information

- The actual to expected ratios in Table 1 represent the total actual claims divided by the total expected claims. Expected claims are derived using best estimate assumptions. These ratios have been calculated based on claim amounts.
- The loss ratios in Table 2 have been calculated as the cost of claims divided by the earned premium for each period.
- Results are gross of reinsurance.
- For all pricing tenders, IndyGrp targets a loss ratio of 0.85 for group TPD business.
- In 2015, IndyGrp paid a $10m (gross of reinsurance) TPD claim to a racing car driver who suffered a catastrophic head injury in a skiing accident. This is IndyGrp's largest payout for individual TPD in its history.
- In December 2012, IndyGrp won a tender for a large group superannuation scheme. Prior to this, the scheme was insured by a competitor. Experience data for this deal was poor when it was priced in July 2012. At the time of pricing there were concerns about incomplete data and delays in reporting claims, however this was not followed up once the deal was completed.
- During 2015 demand for commodities fell sharply signalling the start of a downturn in the mining industry in Australia.

AS AT

a) Explain why loss ratios are used to monitor experience for group business whereas actual to expected analyses are used for individual risk business. **(2 marks)**

b) Compare and contrast underwriting for group and individual risk business and discuss the implications of this for group business. **(5 marks)**

c) The Head of Products has asked for your opinion on IndyGrp's TPD experience. Draft a memo covering the following:-

- Identify the features of individual and group TPD experience that concern you and provide possible explanations for your observations. **(4 marks)**

- Outline what additional information you would require and explain how this additional information could help you. **(6 marks)**

- Suggest recommendations for existing and future new business based on your findings. **(13 marks)**

(Total 23 marks)

END OF QUESTION 3

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