Institute of Actuaries of Australia

2010 PART III EXAMINATIONS

Subject Title: **C2A**
Life Insurance

Date: **Tuesday 19th October 2010**

Time**: 9:15 am – 12:30 pm**

Time allowed: Three (3) hours plus fifteen (15) minutes of reading time

Instructions: Each new question (but not each section of a question) must be commenced in a new answer book.

Number of Questions: **Five** (5)

Question	**Marks**
1	18
2	20
3	20
4	23
5	19
Total	**100**

Candidates are required to answer ALL questions.

This paper has eight (8) pages (excluding this page).

INSTITUTE OF ACTUARIES OF AUSTRALIA

COURSE 2A LIFE INSURANCE **OCTOBER 2010 EXAMINATIONS**

Answer all 5 questions.

QUESTION 1 (18 Marks)

SimpleCred is a company which offers credit cards to a large number of Australians. It sells a simple, no-frills credit card which has very low fees compared to other credit cards in the market. Its main target market is families that have 1 or 2 non-adult children (aged 17 or less) as it perceives that this family size is most likely to remain with a particular low fee credit card, for a long period of time.

SimpleCred prides itself on its customer loyalty, claiming that the proportion of credit card holders who change to another credit card provider is the lowest in the industry.

SimpleCred has 3 categories of credit card (gold, silver and bronze), segregated in terms of credit limits available to the card holder. The up to-date profile of each of these categories is as follows:

Table 1: Customer profiles by category

Customer category	Gold	Silver	Bronze
Number of families belonging to the group (in thousands)	90	393	653
Average outstanding credit balance owing (mid month)	\$22,000	\$10,000	\$2,500
Average age of account holder (assumed to be male)	42	37	45
Assumed family composition in addition to account holder	Female aged 39 plus 2 non-adult children living at home	Female aged 36 plus 1 non-adult child living at home	Female aged 40 plus 1 non-adult child living at home

Credit card holders can apply to change to a customer category with a higher credit limit. Credit card holders can change to a customer category with a lower credit limit at any time.

NeedaBreak is an Australian life insurer that is relatively small by industry standards with approximately \$40 million of annual premium in force business. It has mainly sold individual risk policies via tied agents but is looking to sell new products via new distribution channels.

SimpleCred has recently approached NeedaBreak with a proposal to develop a simplified life insurance policy. This policy would have no underwriting, providing guaranteed automatic acceptance without any underwriting questions and pre-existing conditions would not be excluded. NeedaBreak would pay SimpleCred a benefit in the event of the death of any adult member (excluding any adult children) of a customer's family. The amount of the benefit paid would be equal to the outstanding credit balance owing.

SimpleCred envisages that it would market this life insurance benefit to its customers directly, and that the customer would pay the additional premium alongside their normal card billing process (but with an explicit premium for the life insurance component). The customer would have the option to accept or decline the insurance.

NeedaBreak is looking to price the proposal above and has initially decided on assumptions as follows:

Mortality follows Australian population mortality

Table 2: Australian population mortality

Age	Male	Female
36	0.00116	0.00057
37	0.00121	0.00061
38	0.00128	0.00066
39	0.00135	0.00072
40	0.00143	0.00078
41	0.00153	0.00085
42	0.00163	0.00093
43	0.00175	0.00102
44	0.00188	0.00111
45	0.00203	0.00122

Expense and profit assumptions

- **It is anticipated that 2 additional administration staff would be required at a total cost of $110,000 per year.**
- **Additional claims managers are required.**
  NeedaBreak estimates that:
    - **One claim manager can review and close 4 claims in one day.**
    - **After public holidays, annual leave, sick leave, and training day. there are 206 working days in a year.**
    - **A claims manager's salary is $50,000 per annum.**
- **An amount of 2.5% of premiums to cover SimpleCred's billing expenses is assumed to be paid by NeedaBreak to SimpleCred.**
- **An amount of 10% of premiums is assumed to be paid by NeedaBreak to SimpleCred as commission.**
- **A profit margin equal to 25% of premiums is assumed for NeedaBreak.**
- **Lapses can be ignored.**
- **Tax can be ignored.**

a) Explain the benefits to SimpleCred of this proposal. (3 Marks)

b) SimpleCred's research indicates that 30% of its customers would accept and pay for the insurance policy. Based on this and assuming that all policies accept the insurance at the start of month 1, calculate (ignoring the time value of money and showing all workings) for a 12 month period:

i) The expected claims cost (3 Marks)

ii) All other expected cashflows (besides the claims cost) and NeedaBreak's expected profit. Ignore reserves in your calculations. (6 Marks)

c) Describe the shortcomings with the above approach to pricing. (6 Marks)

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QUESTION 2 (20 Marks)

COTE is a large life insurance company operating in a rapidly developing Asian country selling whole of life and endowment products. These products have until recently been the only products sold within the country and they have been very profitable for the insurers issuing the products. Due to the size of COTE, no reinsurance is used for new business.

To date, only local life insurers have been allowed to operate, but the government recently allowed a number of large global insurers into the market. One of these has teamed with a local bank and developed a simple and cheap yearly renewable term (YRT) life product . This product has seen immediate success in terms of high levels of new business sales.

You are the pricing actuary for COTE and report to the CEO.

The CEO has approached you to discuss developing a similar YRT life product.

a) **The CEO is concerned that the development of a new YRT life product might lead to 'cannibalisation', whereby existing policyholders with a whole of life or endowment products may choose to surrender them and take out a YRT life product.**

   Describe six reasons why a policyholder might want to change from a whole of life or endowment policy to a YRT life policy. (6 Marks)

b) **COTE has approached a reinsurer for their initial views on supporting COTE's venture into developing a YRT life product. The reinsurer has suggested including the risk part of whole of life and endowment products within any treaty. Discuss how the inclusion of whole of life and endowment products within a reinsurance treaty would impact the reinsurance arrangements for the YRT life insurance product. (4 Marks)**

c) **Due to its size COTE has a large amount of experience data for their existing whole of life and endowment products. The CEO believes this information should be used for the pricing of the new YRT life product.**

   Discuss the changes required (including the reasons for such changes) for the following assumptions for the YRT life product, compared to the assumptions used for the whole of life and endowment products:

   i) **Mortality (2 Marks)**

   ii) **Lapse rates (5 Marks)**

   iii) **Expenses (3 Marks)**

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QUESTION 3 **(20 Marks)**

BabyBoom Ltd. is an Australian Life Insurer that specialises in providing life insurance products for those who are approaching or are already in retirement. For many years, BabyBoom has offered a range of annuity and allocated pension products but recently has been concentrating on increasing the sales of a product called "FlexiCert". It believes that FlexiCert offers a range of features that will appeal to a broad range of potential customers and this will allow BabyBoom to gain an even larger share of the retirement income market.

FlexiCert has the following features:

- **It is an investment linked product.**
- **Policyholders can invest money at any time rather than being bound by a regular premium contract.**
- **An allocation fee is charged at 2% of the deposit invested by the policyholder.**
- **A range of investment options covering the major asset classes (such as equities, property, fixed interest and cash) can be selected by the policyholder.**
- **Investment options for either or both existing money and future deposits can be altered by the policy holder at any time.**
- **The policyholder also has the option at policy issue to purchase an investment guarantee that operates like a one-year 'ratchet' – that is, on every policy anniversary, if the account balance is lower than X then it is reset to X, where X is equal to:**

  – **Account balance at last year's policy anniversary +**

  – **Deposits (net of a 2% allocation fee) made in last 12 months –**

  – **Withdrawals made by policyholder in last 12 months**

  The policyholder pays an additional monthly fee for the investment guarantee set at 0.1% of the policyholder's account balance at the end of each month.

- **Withdrawal rates (as measured by the amounts withdrawn by policyholders) are in line with current withdrawal rates for allocated pension products.**

  a) **Describe the risks to BabyBoom arising from the investment guarantee feature of FlexiCert.** **(4 Marks)**

  b) **Describe the other risks (besides those associated with the investment guarantee) to BabyBoom from FlexiCert.** **(4 Marks)**

c) In order to protect against any risks arising from the investment guarantee:

i) Describe the product features that could be adopted. (5 Marks)

ii) Describe strategies other than product features that could be adopted. (3 Marks)

d) A friend of yours wants to compare FlexiCert with a typical investment linked policy. Your friend has heard of a product disclosure statement (PDS).

i) Describe the purpose of a PDS. (1 Mark)

ii) Describe the information typically included in a PDS for an investment linked policy. (3 Marks)

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QUESTION 4 (23 Marks)

GottaSell Ltd. is a medium sized Australian life insurance company which sells a range of individual and group risk products. Although profit has been meeting expectations over the last 5 years, the levels of new business sales have been falling short of budgeted targets and the Board of GottaSell have been making achieving new business targets a higher priority over the last year.

You are the product actuary responsible for the pricing of individual and group insurance products.

The sales manager is relatively new to life insurance, having come from a successful role in running a chain of bookstores. He is struggling with some of the terminology used in the life insurance industry, in particular the vast array of features which seem to be available on certain products.

The sales manager has various questions he would like to ask you. Provide an appropriate response relating to each of his queries below.

a) For a buy back option on an individual term product:

i) Describe the benefits to a policyholder. (1 Mark)

ii) Describe the conditions that apply when exercising this option. (1 Mark)

b) Describe the benefit to a policyholder of a future insurability option on an individual term product. (1 Mark)

c) The sales manager also has various questions about continuation options, which he has heard are available on group insurance policies providing lump sum risk benefits.

i) Describe the benefit of a continuation option to a policyholder. (1 Mark)

ii) Describe why the risk of claim differs between a policyholder exercising a continuation option and a new policyholder joining the group scheme. Assume that both policyholders have the same sex, age and sum assured. (2 Marks)

iii) Describe how the cost of claims arising from a continuation option is built into the premium rates. (3 Marks)

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An independent broker has approached the sales manager with a concern about a large group life policy he has with GottaSell. The group life policy in question:

- **Has 25,000 members who are all white-collar employees.**
- **Has an annual premium of $10 million which is the biggest group scheme that GottaSell currently has.**
- **Offers life cover equal to 4 times an employee's salary (with cover per life capped at $800,000).**
- **Does not currently have an associated continuation option within the terms of the overall group policy.**
- **Does have a profit share arrangement with GottaSell.**
- **Is up for renewal (for a 3 year term) in 3 months' time. You may assume that $10 million is the annual premium GottaSell would charge for this policy in 3 months' time, assuming no change in the policy conditions described above.**

The broker is a key broker for GottaSell, having placed a large amount of business over the past 12 months. His concern is the lack of a continuation option within the policy. He has told the sales manager that:

- **Other group insurers offer continuation options on group policies of this size.**
- **Other brokers have approached the group with quotes for identical coverage as GottaSell for a premium of $9.5 million, but with the additional feature that continuation options are included (this has been confirmed by other information the sales manager has as well).**
- **Surely with such a large premium, and for a group of low-risk (white collar) employees, the additional cost of a continuation option would be minimal.**
- **His preference is to offer the group the renewed policy with GottaSell, but with continuation options added, for a total premium of $9.5 million.**

d) Discuss the issues that arise from offering a continuation option in a group insurance policy. (4 Marks)

e) Discuss the issues you need to consider in relation to the presence of a profit share arrangement on the existing group policy, when comparing the existing reinsurance policy terms and conditions to what the broker has proposed. (4 Marks)

f) Describe the other issues, besides the continuation option and profit share arrangement, you would consider in assessing the broker's proposal. (6 Marks)

QUESTION 5 (19 Marks)

MadeHeapsOfCash Ltd (MHOC) is a long established Australian life insurer, of over 80 years, that has a large book of very profitable endowment and whole of life insurance. MHOC has historically seen itself as a product innovator and as such has many variations of endowment and whole of life policies in force, including participating and non-participating, as well as single premium and regular premium paying policies MHOC has considered this innovation and variety necessary to stay ahead of the competition, and on average has released two new product variations per year.

It also sells a limited range of morbidity products (providing TPD and disability income benefits) as riders to the endowment and whole of life policies.

MHOC has a high level of spare capital and it has sold and continues to sell the majority of its business through a large and long serving agent-based sales force. The agency approach has served it well over many years and many of the agents have been with the company for more than 25 years.

However, over the past two years MHOC has seen its levels of sales drop off quite considerably and also its level of expenses as a ratio of in force premium has been increasing more than anticipated. Though MHOC has a strong capital base and is not too concerned at this stage about its ongoing viability, it has asked you, as a consulting actuary, to advise it on some areas of the business.

a) **Discuss the possible reasons as to why the level of expenses may be increasing more than anticipated. (5 Marks)**

b) **MHOC is considering that a consolidation or rationalisation of many of its older products may be a sensible move. Describe some reasonable methods that could be adopted to encourage policyholders to move to another product. (5 Marks)**

c) **In order to boost sales, MHOC is considering the development of an annuity product. Describe the advantages of such an approach for MHOC. (4 Marks)**

d) **MHOC is also considering a more significant expansion of its morbidity products, including the move to sell them independently of the base endowment and whole of life products. That is, to sell them as a stand alone version rather than as a rider.**

   Describe the risks that MHOC could face with such an expansion. (5 Marks)

END OF PAPER