

EXAMINATION

27 April 2009 (pm)

Subject SA2RSA Specialist Applications – Life Insurance

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of your answer booklet.*
2. *You have 15 minutes at the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You then have three hours to complete the paper.*
3. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*
4. *Mark allocations are shown in brackets.*
5. *Attempt all questions, beginning your answer to each question on a separate sheet.*
6. *Candidates should show calculations where this is appropriate.*

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet, with any additional sheets firmly attached, and this question paper.

<p><i>In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.</i></p>
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QUESTION 1

A large South African proprietary life insurance company sells a diversified product range, including living annuities and non-profit annuities.

It now proposes to offer a hybrid annuity. As with a living annuity, the annuitant may choose the portfolios in which to invest. A nominal investment value is maintained, which equals the amount of the lump sum invested (less upfront charges) growing at the combined rate of return of the portfolios chosen. Under this annuity, the regular payment is equal to a fixed percentage of the nominal investment value at the time, and is payable for life. As with non-profit annuities, there is no return of capital upon death.

- a. Outline the advantages and disadvantages of the hybrid annuity, to both the annuitant and the insurer, by comparing the design to regular living annuities and non-profit annuities. [16]
- b. Describe how the fixed percentage of the nominal investment value will be determined. [6]
- c. Outline how the design may be improved. [3]

Total [25]

PLEASE TURN OVER

QUESTION 2

A large South African proprietary life insurance company currently markets a new generation risk cover product (non-profit policies, with a wide choice of risk benefits and premium growth options). This product was introduced to replace a whole life Universal Life (UL) product that was designed with the main aim of providing risk benefits. The UL product was priced very aggressively (in particular, the cover provided was high compared to the premium), and therefore the expectation was that the investment portfolio would be eliminated over time. The premiums were guaranteed for 15 years.

- i. A large number of regular premium UL policies are now reaching the end of the guarantee period, and most of them have had their investment portfolio fully depleted. Discuss the alternatives available to the company and the issues it will consider in determining how to treat these policies.

[15]

- ii. The insurer currently sells the new generation risk product via agents and brokers. It now proposes also to sell it through its direct marketing arm, which already markets savings business. Describe the issues the company will need to consider in offering the product via direct marketing, including factors related to product design and pricing.

[15]

Total [30]

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QUESTION 3

A small proprietary life office transacts unit-linked endowments and conventional term assurances.

At the close of each financial year the life office calculates the Embedded Value of its business. The Embedded Value is the sum of the shareholders' net assets and the present value of future profits from the in-force business. The change in Embedded Value over the year is consolidated in the bank's group profit and loss account. At the same time the change in Embedded Value is analysed. The major components of the change in Embedded Value are also identified and quantified in the group accounts.

The life office has almost completed the Embedded Value calculations for the financial year ended December X. The following two tables reflect the results determined thus far. Comparatives for the previous two years are also included.

Table 1

EMBEDDED VALUE OF COVERED BUSINESS	31/12/X - 2 Rm	31/12/X - 1 Rm	31/12/X Rm
Free surplus	6	10	8
Required capital	20	20	20
Covered business Adjusted Net Worth (ANW)	26	30	28
Present value of in-force business	222	270	**
Cost of required capital	-4	-4	**
Embedded Value of covered business	244	296	**
EMBEDDED VALUE EARNINGS			
Embedded Value at the end of the period	244	296	**
<i>Less</i> Capital raised / transfers to covered business	-46	-	-
<i>Plus</i> Dividends accrued or paid	-	10	12
<i>Less</i> Embedded Value at start of year	-180	-244	-296
Embedded Value earnings	18	62	**

** = not yet determined (see below)

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Table 2

Components of Embedded Value earnings	31/12/X - 2 Rm	31/12/X - 1 Rm	31/12/X Rm
Value of new business written in the year	28	20	**
Expected return on covered business	26	36	42
Operating experience variances (split as follows):			
Administrative expenses	-4	-10	-10
Lapses/surrenders	-6	-6	-6
Deaths	4	6	4
Operating assumption and model changes	-	-	**
Expected return on ANW	2	4	4
Embedded Value operating return	50	50	**
Investment return variances	-32	12	4
Effect of economic assumption changes	-	-	**
Embedded Value earnings	18	62	**

During these three years, the key Embedded Value assumptions have been:

- Risk discount rate: 15% p.a.
- Investment return: 11% p.a. net of tax
- Mortality, lapse/surrender: average levels experienced in years $X - 5$ to $X - 3$
- Administrative expenses: year $X - 3$ experienced levels plus inflation at 8% p.a.

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The following information appears in the life office's accounts and statements for the three years:

Table 3

Year ended 31 December	X - 2 Rm	X - 1 Rm	X Rm
Shareholders' funds at start of year (market value)	56	26	30
Long-term business assets at the start of the year (market value)	1006	1124	1456
Long-term business liabilities at start of year:			
Unit-linked endowments	694	802	920
Term assurances	220	282	414
Premium income during year	246	310	358
Expenses & commission during year	142	116	140
Claim payments during year:			
Death	16	18	18
Maturity	10	18	28
Initial annual premiums for new business written during year	84	54	70
Average unexpired term of business in-force at end of year	12.0 years	10.3 years	9.5 years

The valuation actuary is about to review the Embedded Value assumptions prior to determining the final Embedded Value results (those marked ** in Table 1 and Table 2 above).

- i. Describe the main components of the change in Embedded Value (as outlined in Tables 1 and 2 above) and suggest reasons for the pattern of these numbers over time. [9]
- ii. Discuss the changes that may be required to the key Embedded Value assumptions. [9]
- iii. The changes referred to in part (ii) above are likely to result in a closing Embedded Value that differs from the value determined using the original Embedded Value basis. Discuss the likely changes that can be expected in this value as well as the components of Embedded Value earnings. [5]

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iv. The board of directors has decided to move to an Embedded Value basis which more closely reflects the market conditions each year. Explain the differences between the proposed and current approaches to setting the Embedded Value basis, and how the change would affect the calculation and disclosure of the Embedded Value results. [15]

v. A director has commented on the poor previous administration expense results. He has suggested that the company ceases to obtain doctors' reports for term assurances. Discuss the director's suggestion and the impact on the company of implementing it. [7]

Total [45]

END OF PAPER