SA stage subjects

Actuarial Society of South Africa

EXAMINATION

2 November 2010 (am)

Subject F202 — Life Insurance

Specialist Applications

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.*

AT THE END OF THE EXAMINATION

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

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator.

QUESTION 1

You are an actuary working for an established proprietary life insurer which markets its products through a direct sales force and through Independent Financial Advisers. You have been asked to review the valuation assumptions of the company's unit-linked endowment portfolio. The company started writing this business eight years ago. For the first five years the sales were good, but have reduced significantly over the last three years.

i. Describe how you would analyse the withdrawal experience, mentioning any problems you might encounter. [8]

ii. Discuss how you would use the results of the analysis to produce suitable withdrawal assumptions to be used in the valuation. [7]

iii. Describe how you would determine the initial, renewal and claim expenses for the valuation. [9]

iv. List all the prescribed margins required according to PGN104 per assumption (not only those margins applicable to unit-linked business). [4]

[Total 28]

PLEASE TURN OVER

QUESTION 2

You are the product development actuary working for a small recently established proprietary life insurer that sells only pure individual life risk products. The life company has a large assessed tax loss in the Individual Policyholders Fund (IPF).

i. Describe the taxation basis of the IPF and how the assessed tax loss would have arisen.

[8]

A reinsurer has approached the company and suggested that the company sell the assessed tax loss to other companies to back their Guaranteed Capital Bond policies. A Guaranteed Capital Bond is a product where for a fixed single premium the company guarantees a return (i.e. a fixed maturity value) after five years.

ii. Describe how this could be done and discuss the factors that the company will have to take into account.

[14]

iii. Discuss any additional factors (including administrative issues) that the company will have to consider if they decide to enter the Guaranteed Capital Bond market directly.

[8]

A government working party has now suggested that risk products and investment products be taxed separately. The suggestion is that investment products continue to be taxed as currently, but that risk products be taxed on profits.

iv. Discuss the possible reasons for this suggestion and likely actions by life insurers to mitigate the impact.

[6]

[Total 36]

PLEASE TURN OVER

QUESTION 3

A South African proprietary life insurance company, Company B, has sold a variety of individual life smoothed bonus products in its long history. Each of these products has a separate smoothed bonus fund, and does not share in the profits of any other products.

The company's TrustyBonus product declares bonuses annually in arrear. As a result of poor recent investment performance, Company B is considering lowering the TrustyBonus interim bonus rate, which is currently set equal to the last declared rate.

i. Discuss the factors the company should consider when deciding whether to lower the interim bonus rate. [8]

RegularBonus, another smoothed bonus product, also has bonuses declared annually in arrear. It has been proposed that the design of RegularBonus should be changed to declare fully vesting bonuses monthly in advance. The following bonus formula has been proposed:

Monthly bonus = LTR + (funding level – 105%) ÷ 72, with a minimum of zero.

Where LTR is the expected long term return on the underlying assets, calculated as the monthly equivalent of: the 10-year government bond yield,

plus an equity risk premium of 3% multiplied by the proportion of assets currently invested in equities,
plus a property risk premium of 2% multiplied by the proportion of assets currently invested in property,
plus similar adjustments for other risky asset classes.

The funding level is the market value of assets divided by the book value of the liabilities (the sum of the premiums paid and declared bonuses).

ii. Discuss the key considerations for the company in assessing whether to change to monthly bonuses, and comment on the appropriateness of the proposed bonus formula. [10]

The smoothed bonus fund of a third product, ReliaBonus, has steadily been reducing in size over recent years.

iii. Discuss the actions Company B should consider to manage the risks of a shrinking smoothed bonus fund. [18]

Total [36]

Grand Total [100]

END OF PAPER

