

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

26 September 2011 (pm)

Subject ST2 — Life Insurance Specialist Technical

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 six 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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- 1** A well-established life insurance company is looking to improve its capital position by putting in place some financial reinsurance.
- (i) Describe the two main types of financial reinsurance. [4]
 - (ii) Explain how these can improve the capital position of the company. [6]
- [Total 10]
- 2** The Finance Director of a life insurance company has suggested that in order to cut costs, the amount of underwriting that the company carries out should be reduced.
- Discuss this suggestion. [11]
- 3** A proprietary life insurance company sells conventional with profits endowment assurances.
- (i) Describe the risks to the company of selling this type of business. [7]
 - (ii) Describe the risks to the policyholder of purchasing one of these contracts. [4]
 - (iii) Describe the method usually used to calculate the asset share for this type of contract. [8]
- [Total 19]

- 4 A proprietary life insurance company sells only three-year term single premium unit-linked endowment assurances.

The company provides financial returns annually to its regulator. At year end 2010, these showed:

Assets	5,000
Unit reserves	4,000
Non-unit reserves	300
Solvency capital requirements	200

Of the unit reserves in force, 25% mature on average six months after the valuation date, 25% mature in 1½ years, and 50% in 2½ years.

Non-unit reserves, which are calculated on a very prudent basis, and solvency capital requirements are released in the same pattern as the unit reserves mature.

In its embedded value as at year end 2010, the company assumes the following:

- Earned investment returns on all assets of 10% per annum.
- Annual management charges of 2% of unit funds, deducted half way through the calendar year.
- Expenses of 1% of unit funds, incurred half way through the calendar year (you may assume that charges and expenses occur before any policies mature).
- Lapses and mortality are so low that for embedded value purposes they can be ignored.
- Risk discount rate of 12% per annum.
- No tax is payable.

- (i) Calculate the embedded value of the company. [8]
- (ii) Describe how the approach to determining the embedded value would be different if the contracts were all conventional with profits contracts with reserves based on a net premium valuation, and shareholder transfers based on a percentage of policyholder reversionary and terminal bonus declarations. [No calculations are required.] [6]
- (iii) Describe the impact of increasing the level of prudence in the reserves on the embedded value of both unit-linked and conventional with profits contracts. [3]

[Total 17]

- 5** A life insurance company has been selling a unit-linked whole life assurance product for a number of years.

The unit-linked whole life product allows the policyholder to pay a monthly premium for a selected premium payment term of between five and twenty-five years. The policyholder can choose from a variety of available unit-linked funds and can switch between funds at any time, subject to a switch charge. Each fund is subject to an annual management charge that varies by fund.

Units purchased in the first two years are “initial” units; thereafter, “accumulation” units are purchased. The only difference between these types of units is that the initial units have a higher annual management charge than the accumulation units.

On death the policyholder will receive 101% of the bid value of the initial and accumulation units held at the time of death.

On surrender after the first year, a surrender penalty is applied to the bid value of units equal to the value of the outstanding annual management charges on the initial units from the point of surrender to the 70th birthday of the policyholder.

If premiums are stopped during the first year, the policy terminates with no value. Policies may be made paid-up, or premiums may be reduced or increased, after the first year.

- (i) List the assumptions that would be required when setting up supervisory reserves for this product. [3]

Recently, the company has experienced poor persistency on this product, both in terms of full surrenders and contracts reducing or stopping paying premiums. It is about to conduct its annual investigation into the persistency experience over the past year on this product.

- (ii) Describe how this investigation would be performed. [10]

- (iii) Suggest possible reasons for the poor persistency. [6]
[Total 19]

6 A life insurance company has been writing conventional without profits whole life policies for the last ten years.

(i) List the principles that the company should follow when calculating surrender values. [4]

(ii) Outline the retrospective and prospective methods of calculation of surrender values. [4]

When the product was launched a table of surrender values by policy duration was created which was a blend of values calculated under these two methods. The prospective values were created using a realistic basis at the time of launch and have not been reviewed since. The surrender values are not guaranteed and the table has not been disclosed to policyholders.

(iii) Discuss why the company used a blend of approaches. [5]

The company has seen less profit emerging per surrender than was anticipated when the product was launched.

(iv) Discuss what may have led to this lower than expected profit per surrender. [8]

(v) Suggest ways in which the surrender value terms could be changed in order to increase the profit made on surrender. [3]

[Total 24]

END OF PAPER