

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

22 April 2013 (am)

Subject SA2 – 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 three 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 UK proprietary life insurance company has only ever sold conventional non-linked immediate annuities. The company sells both “normal” annuities and impaired life annuities. Annuity benefits are payable annually and all such payments are made on 31 December each year.

At the end of 2011:

Solvency I Pillar 1 liabilities = £5.2m

Resilience capital requirement = zero

Annuities in force = £400,000 per annum

Average outstanding term of the liability cashflows = 14 years

Assets backing the liabilities were invested in a mixture of corporate bonds and gilts, also with an average outstanding term of 14 years. The expected asset and liability cashflows can be assumed to be exactly matched.

Yield on these assets = 6% per annum

Risk-free rate (based on gilt yields) for a 15 year term = 5% per annum

The company calculates the risk-adjusted yield for valuing the liabilities by deducting a credit risk margin. This is determined as 40% of the spread between the yield on the actual assets held and the risk-free rate.

It can be assumed that changes in yields broadly impact asset market values and the value of liabilities in line with the average outstanding term.

Due to an outsourcing agreement, actual expenses are a fixed percentage of the annuities paid and are also incurred on 31 December. The supervisory valuation basis uses the same percentage loading to the annuities, with no additional margin. The figure for annuities in force quoted above includes this loading for expenses.

In 2012 the following occurred:

The average actual mortality rate was $q = 0.01$.

Although actual mortality experience was as assumed within the supervisory valuation basis, the company strengthened its mortality assumptions at the end of 2012 in line with recent industry analysis. The impact of this was to increase the outstanding duration of the liabilities and so increase reserves by 3%.

There were no asset defaults but spreads widened. The average yield on the assets increased to 7% per annum at the end of the year. Risk-free rates remained unchanged.

The company sold £1m of new business premiums, which resulted in a Pillar 1 loss of £50,000 (measured as at the end of 2012).

The outsourcing arrangement and expense loadings remained unchanged.

The company calculates its Pillar 1 supervisory valuation surplus before allowing for any LTICR. Investment return on existing surplus assets can be ignored.

Note: In order to answer parts (i) and (ii), it is not necessary to use annuity factors or to calculate the present value of liabilities.

- (i) Derive the surplus arising over 2012. [14]

When analysing the surplus, the company first calculates the expected release of any valuation basis margins. The impact of assumption changes and new business are last to be analysed.

- (ii) Analyse the surplus arising over 2012, explaining your workings. [14]

The insurance company aims to hold capital in excess of its basic Pillar 1 capital requirements.

- (iii) Discuss possible reasons for this. [12]

- (iv) Discuss the modelling considerations for the company when calculating its economic capital requirements. [12]

During the development of the Solvency II valuation rules, one suggestion was that the technical provisions should be valued using unadjusted swap rates. Swap rates can be assumed to be broadly risk-free rates, although they may include a small credit spread. This spread would be expected to be significantly lower than the spread on the assets held by the company.

- (v) Discuss the impact that this rule could have on this company's balance sheet, compared with its current approach to the determination of the valuation rate of interest. [4]

- (vi) Outline the actions that the company might have to take, if this rule were introduced. [4]

[Total 60]

- 2** (i) Describe how a single premium unit-linked investment bond would be taxed from the viewpoint of a UK policyholder. (You may assume that such a policy is “non-qualifying” for taxation purposes.) [4]

It is 2015, and the following is an extract from the tax computations of a UK proprietary life insurance company.

		2013 £k	2014 £k
BLAGAB	I (excluding dividend income)	600	900
	Share of dividend income	-	-
	E (including any carried forward XSE)	500	300
	Life Assurance Trade Profits	200	250
OLTB	Premiums	170	260
	Investment income	40	80
	Increase in value of assets	20	40
	Expenses	30	25
	Benefits paid	30	40
	Value of liabilities at the start of the year	600	700
	Value of liabilities at the end of the year	700	1,000
	Loss brought forward	20	-

- (ii) Determine the company’s tax liability for the years 2013 and 2014, explaining your workings. (You may assume that the policyholder rate of tax is 20% and the corporation rate of tax is 24%, in both years.) [10]
- (iii) Discuss possible reasons for the main movements in the information provided in the table above and what they might mean for the future taxation basis of the company. [10]

[Total 24]

- 3** A UK proprietary life insurance company sells a BLAGAB single premium unit-linked product.

Prior to the Retail Distribution Review (“RDR”), the only charges for this product were fund-based charges and surrender penalties, both expressed as a percentage of the value of the unit fund. The product was sold through financial advisers in return for initial commission at the point of sale. The pricing model showed this product to be profitable.

As part of the 2012 pricing review of this product, the company first wanted to understand the impact of implementing the RDR without changing any factors other than the premium. Therefore the pricing model was re-run with a premium equal to the pre-RDR premium minus the initial commission, and with initial commission set to zero. No other changes were made to the product design or assumptions used.

- (i) Explain the likely impact of these changes on the output of the pricing model. [10]
- (ii) Discuss the changes which might have been made to the product’s pricing and charging structure as a result of the RDR. [6]

[Total 16]

END OF PAPER