INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

23 April 2012 (pm)

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 BOTH 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.

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.

1 A UK life insurance company has written unit-linked pension contracts, with and without guaranteed annuity rates, and immediate annuities for several years. Under the pension contracts, the benefit available on withdrawal is the value of the unit fund with no surrender penalties. The amount available at retirement for both versions of the pension contract is the value of the unit fund.

The company does not produce an embedded value, but does carry out a valuation on a best estimate basis in order to assess its realistic position. In this valuation, the discount rate used for the immediate annuity liabilities is based on the actual yields on the backing assets less a proportion of any credit spread to allow for expected defaults. The discount rate used for non-unit reserves is based on gilt yields.

Recently the actuarial department has produced an analysis of the surplus which has emerged in the fund over the past financial year on the best estimate basis.

(i) Outline reasons why a company would want to analyse the change in the surplus. [2]

An extract from the analysis of surplus for the most recent valuation period is shown in the table below.

Over the period, yields on UK government bonds and corporate bonds fell at all durations, and equity markets rose slightly. The company has changed its discount rates in line with these yield changes, and this impact is included within the "Investment return" analysis item. Other elements of the best estimate basis have not been changed.

£m	*Immediate Annuities*	*Unit-Linked Pensions without guaranteed annuity rates*	*Unit-Linked Pensions with guaranteed annuity rates*
....			
Investment return	–£20m	+£2.5m	–£20m
Decrements	+£10m	–£20m	
....			

The Finance Director has asked why decrements have not been analysed by type of decrement.

(ii) Discuss why the decrements may not have been analysed by type of decrement. [6]

(iii) Discuss what may have caused the results shown in the table above (empty cells can be ignored). [19]

(iv) Suggest how the items showing losses could be better managed in future. [10]

[Total 37]

2 A small UK life insurance company writes single premium unit-linked contracts with the following product features:

- 100% of the single premium is invested in units.
- The customer can choose from a range of unit-linked funds, covering a wide range of UK asset classes.
- A fixed annual management charge of 1% per annum is deducted from the unit fund.
- A penalty applies on surrender in the first five years. This is expressed as a percentage of the value of units held at the time of surrender.
- The death benefit is 101% of the value of units at the time of claim. No specific additional mortality charges are deducted to cover this benefit.
- A "money back" guarantee applies on the tenth anniversary of the policy.

  Provided no partial withdrawals have been taken before the tenth anniversary, the benefit on surrender at the tenth anniversary will be the higher of the original single premium or the value of units.

  To pay for the guarantee, an x% per annum charge (in addition to the 1% annual management charge) is deducted from the unit fund during the first ten years. The value of x is fixed throughout the term of the policy and depends on the unit-linked fund selected by the customer.

The company is preparing for the introduction of Solvency II.

(i) Describe how it might determine the best estimate liability for this product under Pillar 1 of Solvency II. [24]

(ii) Describe how the risk margin would be calculated for this product. (It is not necessary to describe the Solvency Capital Requirement (SCR) calculation.) [9]

(iii) Discuss whether it would be appropriate for the company to use the standard formula or an internal model in order to determine the SCR. [10]

(iv) List the insurance risk sub-modules for life insurance business in the standard formula Basic SCR, stating whether each applies to this product. [4]

During its Solvency II preparations, the company has determined that it has a low appetite for risk and that it should target achieving a high credit rating from the credit rating agencies.

(v) Describe the requirements of Pillar 2 of Solvency II, including how they might impact the management of this product. [16]
[Total 63]

END OF PAPER