

INSTITUTE AND FACULTY OF ACTUARIES



EXAMINATION

30 April 2015 (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 both questions, beginning your answer to each question on a new page.*
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 been selling unit-linked pensions business and conventional without profits immediate annuities for a number of years.

- (i) Outline the liability and capital requirement elements of Pillar 1 Peak 1 (Solvency I) that the company is required to hold for the annuities. [5]

Under the unit-linked pensions business, the unit fund is payable on death. Mortality rates are very low and, therefore, the company does not consider mortality to be a main risk in respect of that business.

However, it has identified six other types of risk arising that it considers to be main risks under one or both of the product lines.

- (ii) (a) List the six main risk types that the company is likely to have identified.
- (b) State, for each of these main risks, whether it would be relevant to the unit-linked pensions, the immediate annuities or both. [6]

The insurance company is currently considering the correlation factors that it uses for its Individual Capital Assessment (ICA), and in particular the correlations between pairings of the six main risks that it has identified. The factor is assumed to be zero for some of these risk pairings.

- (iii) Suggest, with reasons, appropriate correlations between the main risks identified in part (ii) for those correlations that are likely to be treated as non-zero. You only need to indicate the direction of each correlation and do not have to suggest the possible magnitude. [10]

The insurance company has entered into a reinsurance treaty which covers some of the annuities in payment. There is a deposit back arrangement in place whereby the reinsurer deposits back an amount equal to 101% of the Pillar 1 Peak 1 reserves for the annuities covered. The assumptions for the deposit back calculation are set by the reinsurer but are subject to challenge by the insurance company. The calculations for the deposit back arrangement are performed monthly.

- (iv) Explain the purpose of the deposit back arrangement. [1]

The insurance company performs its own calculation of the Pillar 1 Peak 1 reserves for the reinsured annuities, using the basis that it would use were they not reinsured. The company has compared the latest deposit back amount to its own reserve calculation and has discovered a 2% difference.

- (v) Suggest possible reasons for the difference. [8]

From 2016, Solvency II metrics will be used for the deposit back calculation. However, some approximations will be required as the deposit back is calculated on a monthly basis.

- (vi) Discuss possible approaches that could be taken to the deposit back calculation following the introduction of Solvency II, including:
- which Solvency II balance sheet components should be included.
 - issues that could arise in relation to the calculation.
- [11]
- (vii) Explain what other changes the company may be required to make under Solvency II Pillar 1 in respect of this reinsurance arrangement. [3]
- [Total 44]

2 A UK proprietary life insurance company writes conventional without profits immediate annuity business for standard and severely impaired lives.

The company currently reports profits using the Market Consistent Embedded Value (MCEV) principles. It is expecting to use the standard formula for its Solvency II reporting and, as part of its preparation for Solvency II, is in the process of developing and updating its MCEV approach.

The company has decided to calculate its embedded value under Solvency II as the sum of the following components:

- Free surplus, which is defined as the excess of the market value of assets over the total Solvency II liabilities and capital requirements. Total liabilities and capital requirements comprise the best estimate liabilities (BEL), the risk margin (RM) and the Solvency Capital Requirement (SCR).
- The sum of the RM and the SCR, less the cost of holding these risk margin and capital requirements.

The calculation does not include addition of the value of future profits on in-force business (VIF).

- (i) Evaluate the appropriateness of not including a VIF element in the calculation of the embedded value under Solvency II. [6]

The company currently analyses its MCEV in line with the approach suggested by the European Embedded Value (EEV) guidance.

It has been suggested that this format should continue once the company reports under Solvency II.

- (ii) List the items that would typically be included in the analysis of change in the MCEV. [3]

The company is considering how it should determine each of the items that contribute to profit/loss in the analysis of change in embedded value once it moves to the Solvency II basis in the following year. It intends to restate the opening embedded value using the Solvency II basis.

- (iii) Describe how the company could analyse the contribution to embedded value from the impact of variances in experience relative to the assumptions made in the BEL. [4]
- (iv) Compare the approach that will be taken to determine each of the profit/loss items in the analysis of change in embedded value with the approach taken at present. [13]
- (v) Comment on the suggestion that the company should apply the same format for presenting its analysis of change in embedded value under Solvency II as it does at present. [2]

Recent changes in UK legislation relating to pensions mean that customers now have more flexibility around how to invest their pension funds and are no longer required to invest in an immediate annuity.

- (vi) Assess how the removal of this requirement might impact the current and future reported embedded value, including how the impacts would be classified in the analysis of change. [8]

The company is planning to launch a new single premium product, which it will sell alongside its existing products.

This new product will be marketed to those of retirement age and will be sold through financial advisers. The single premium is paid out of the maturity proceeds from the customer's existing personal pension arrangement(s).

Part of the premium is used to provide an insurance component. This component will give the policyholder a guaranteed monthly benefit for life from the age of 85. The amount of the benefit is either fixed or linked to inflation (from the date of purchase). There would be no benefit payable under this insurance component in the event of death before age 85. There is also no surrender value payable in respect of this insurance component.

The remainder of the premium will be used to provide the investment component. After an initial charge is taken, the remaining premium will be invested in a range of different unit-linked funds, including low risk fixed interest funds, at the policyholder's choice. An annual management charge will be taken, which is expressed as a percentage of the fund value and varies by fund.

The customer will be allowed to withdraw both income (i.e. earned investment returns) and capital from the unit-linked funds without penalty. There will be a return of the total unit value of the funds on death or on surrender.

The company believes that it will be able to arrange the funds in such a way that the investment component will be deemed to remain as part of a pension fund arrangement and so will attract beneficial tax treatment.

- (vii) Describe the additional risks to the company that are introduced by this new product. [20]

[Total 56]

END OF PAPER

