INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

12 April 2019 (pm)

Subject SA2 – Life Insurance Specialist Applications

Time allowed: Three hours and fifteen minutes

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of your answer booklet.*

2. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*

3. *Mark allocations are shown in brackets.*

4. *Attempt all questions, begin your answer to each question on a new page.*

5. *Candidates should show calculations where this is appropriate.*

Graph paper is NOT required for this paper.

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 proprietary life insurance company sells only without profits products (including unit-linked) and is regulated by the Solvency II regime. The company uses the standard formula for assessing its Pillar 1 capital requirement and employs a matching adjustment.

(i) Describe the term ‘matching adjustment’. [2]

(ii) Describe the differences between ‘required capital’ and ‘available capital’ in the context of Solvency II Pillar 1. [2]

The company defines the difference between the required capital and the available capital under Solvency II reporting as the ‘Capital Margin’.

(iii) Discuss the impact of the following scenarios on the required capital, available capital and the Capital Margin on a Solvency II Pillar 1 basis.

(a) An increase in the value of equities. [4]

(b) An increase in maintenance expenses. [4]

(c) Credit spreads widening on corporate bonds. [5]

(d) Increased risk of default from reinsurance counterparties. [5]

It has been suggested that the company should be managed so that the Capital Margin is significantly lower than at present.

(iv) Suggest possible reasons why the company would want to have a lower Capital Margin. [5]

(v) Discuss the risks for the company of having a lower Capital Margin. [7]
[Total 34]

2 A UK proprietary life insurance company that writes only with profits business has been experiencing low volumes of new business. It does not have a formal run-off plan in place but makes distributions of the estate on the advice of the With-Profits Actuary (WPA).

The company defines the estate as the difference between assets and the best estimate liability (BEL). The BEL is calculated as asset shares plus the "net time value of guarantees" (NTVOG). The NTVOG is calculated as the present value of the difference between projected payouts and asset shares due to guarantees and smoothing, less the projected present value of future charges that are taken from asset shares in respect of guarantees and smoothing.

The company manages the assets by notionally allocating assets into two funds: F1 and F2. F1 holds assets backing asset shares and the estate, and is invested in a mix of equities, fixed interest securities and cash. F2 holds assets backing the NTVOG and is invested in fixed interest securities and cash only.

(i) Justify why the company has adopted different investment strategies for F1 and F2. [5]

The table below shows the balance sheet position of the estate at the beginning and end of the latest year. The asset share amounts shown have not had any smoothing applied.

£000	*Assets*	*Asset shares*	*NTVOG*	*Estate*
1 January	100,000	70,000	10,000	20,000
31 December	92,980	59,100	8,000	25,880

The company's analysis of the movement in assets is set out below:

	£000
Assets at 1 January	100,000
Net investment return (net of tax and investment expenses)	9,580
Premium income	100
Death claims	–200
Maturities	–10,000
Surrenders	–1,000
Expenses	–5,100
Shareholder transfers	–400
Assets at 31 December	92,980

It can be assumed that cashflows occur half way through the year, but the value of the NTVOG is only updated at the end of the year.

The net investment return earned on F2 over the year was 1%. Therefore the total net investment return has been allocated to F2 and F1 as follows:

	£000
Total	9,580
F2 (10,000 × 1%)	100
F1 (balance)	9,480

The initial allocation of the net investment return in F1 between asset shares and the estate has been checked as part of the control process and found to be incorrect.

The incorrect approach taken was as follows:

> Assume the investment return earned on F1 = i
> F1 at 1 January = 90,000
> F1 at 31 December = 84,980
> $i \times (90{,}000 + 84{,}980)/2 = 9{,}480$
> So $i = 9{,}480 \times 2/(90{,}000 + 84{,}980) = 10.836\%$
> Of which $(70{,}000 + 59{,}100)/2 \times 10.836\% = 6{,}994$ is in respect of asset shares, and $10.836\% \times (20{,}000 + 25{,}880)/2 = 2{,}486$ is attributed to the estate.

(ii) Comment on what is wrong with the above approach. [4]

The investment return allocated to asset shares has now been corrected to 6,786 (£000). Additionally, the company experienced the following during the year:

- Death claims were on average 60% higher than asset shares, and the excess was charged to the estate.
- Smoothed asset shares were approximately 90% of asset shares.
- Maturity claims were based on smoothed asset shares, increased by 5% to allow for some distribution of the estate.
- Surrender values paid out were equal to 100% of unsmoothed asset shares.
- All non-investment expenses were allocated to asset shares.

(iii) Analyse the movement in asset shares over the year. [6]

(iv) Suggest what might be included in any unexplained item of your analysis in part (iii). [2]

(v) Analyse the movement in the estate over the year. [6]

The WPA has been asked to investigate if the with profits policyholders are being treated fairly. The WPA has already been provided with the output of the analyses of asset shares and estate.

(vi) Outline the additional information the WPA would need for the purposes of this investigation. [13]

Having considered the company experience over the year and the additional information in part (vi), the WPA has been asked to prepare a report on:

- whether policyholders have been treated fairly; and
- if not, the actions that would be required.

(vii) Set out the points the WPA should cover in the report. [20]

A suggestion has been made to formalise when the estate should be distributed, using the following formula:

If estate > x% of asset shares, then the excess over x% of asset shares should be distributed.

If y% of asset shares < estate < x% of asset shares, then consideration should be given to distributing some of the estate in excess of y% asset shares.

(viii) Evaluate this suggestion. [10]

[Total 66]

END OF PAPER