

EXAMINATION

20 October 2022

Subject F202 — Life Insurance Specialist Applications

Time allowed: Three hours and twenty minutes (which includes five minutes for downloading and uploading your answer document)

Total marks: 100

INSTRUCTIONS TO THE CANDIDATE

1. Ensure that you are logged in and authenticated through Examity before you attempt the examination.
2. The question paper is only available in the ASSA Exam Platform as a PDF download and may not be printed. Copy/paste of questions or parts thereof is allowed from the question paper to your Word answer document only.
3. You will be provided with a Word template within the ASSA Exam Platform to download and use to complete your questions. Submit your answers in Word format ONLY using the answer template provided. No uploads of answers (handwritten or otherwise) will be accepted.
4. Ensure that your candidate number appears in the Header of your Word template. [Double-click on the header, input your candidate number only, then press “Esc” to close the header.] Do not use your name or member number anywhere in your answer document nor as file name.
5. You may not access any file from your computer, use any other computer program (e.g. Email or Excel), or open any other browser during the examination.
6. You may not use any other material (e.g. a Formulae and Tables book) during the examination. Any such information that may be required will be provided to you within the examination.
7. You are strongly encouraged to use the first 15 minutes as reading time only, however, you may start answering the paper whenever you are ready.
8. Mark allocations are shown in brackets.
9. Attempt all questions.
10. Show calculations where appropriate. You may use blank paper to carry out rough work calculations. You may use a calculator from the approved list only.
11. Upload your Word answer document only into the ASSA Exam Platform. Once you have uploaded your file, you must click on **Finish Attempt** to save your document. You will still be allowed to go back and make changes (**Review Attempt**) if you have time.
12. Once you are satisfied with your uploaded document, click **Finish attempt** and **Finish all and Submit**. Once you have submitted you will not be able to make any changes.
13. **You must submit your Word answer document BEFORE the end of the allotted examination time.** Take this into account when planning your review and submission. There will be no time announcements.

Note: The Actuarial Society of South Africa will not be held responsible for loss of data where candidates have not followed instructions as set out above.

END OF INSTRUCTIONS

QUESTION 1

A South African life insurance company has a large, closed book of universal life policies and currently sells risk-only whole of life assurance products. The company is considering launching a term life assurance product.

- i. Outline the factors a life insurance company should consider in deciding whether to launch the new product. [10]
- ii. Outline the differences between universal life products and risk-only whole of life assurance products. [7]
- iii. Discuss the factors that could lead to divergences between the observed mortality and lapse rates over time between the universal life products and risk-only whole of life assurance products. [8]
- iv. Describe how the mortality and lapse rates for the new risk-only term life assurance product may differ from those observed on the current whole of life assurance product. [5]

[Total 30]

QUESTION 2

A South African life insurance company has two smoothed bonus investment products that it sells to individual clients as an investment option for endowment and retirement annuity policies.

Product A is closed to new business. Bonuses are declared annually in arrears, with an interim bonus declared for periods after the last bonus declaration date. Bonuses are split 80/20 into a vesting and non-vesting part. Each year 25% of the non-vested fund is transferred to the vested fund.

Product M, which is open to new business, has bonuses that are declared monthly and vest fully on declaration.

- i. Describe how the company can manage these products in accordance with Treating Customers Fairly (TCF) outcomes. [27]

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The administration fees are the same for both products. However, Product A has a capital charge of 0.6% p.a., whereas Product M has a capital charge of 0.9% p.a. (both a percent of market value).

Product A is the only company product still administered on an old administration system. The company is considering moving the Product A policies to the newer admin system and combining them with Product M to save costs. The proposal is that Product A policies will be transferred to Product M.

- The transfer amount (at book value) will be seen as a single premium in Product M.
 - Product A and Product M's assets will be combined.
 - Bonus rules will be the same as for Product M.
 - Fees and charges will be the same as for Product M.
- ii. Discuss the factors that should be considered in such a conversion and suggest alternatives that could address some of the main issues that emerge. [13]

[Total 40]

QUESTION 3

A South African life insurance company sells annually renewable Group Life Assurance business. In previous years it had set up discretionary reserves. Interest on these reserves was released to profit each year. Over the last year the company experienced a very high level of claims due to the COVID-19 pandemic. It released the discretionary reserves at the end of the year.

Discuss the effect the high claims and reserve release will have on profits, the Solvency Capital Requirement (SCR) cover and Embedded Value at the end of the year.

[Total 10]

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QUESTION 4

A South African life insurance company has been selling unit-linked business and without profits annuities for a number of years.

The capital requirements from the solvency capital requirement stresses are shown below as well as the combined scenario results after allowing for the correlation between risks.

Table A:

	Capital required (R'm)
<u>Individual stresses</u>	
Equity	100
Property	25
Spread and default	20
Longevity	35
Mortality	30
Lapse risk	20
Expenses	10
Sum of individual stresses	240
Market risk	110
Insurance risk	80
BSCR	151

The correlation matrix used for the market risk components is set out below.

Table B:

<u>Market risk correlation</u>	Equity risk	Property risk	Spread and default risk
Equity risk	100%	75%	75%
Property risk	75%	100%	50%
Spread and default risk	75%	50%	100%

The correlation matrix used for life underwriting risk components is set out below.

Table C:

<u>Life risk correlation</u>	Longevity risk	Mortality risk	Lapse risk	Expense risk
Longevity risk	100%	?	25%	25%
Mortality risk	?	100%	0%	25%
Lapse risk	25%	0%	100%	?
Expense risk	25%	25%	?	100%

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The correlation matrix between market risk and life underwriting risk is set out below.

Table D:

	Market risk	Life underwriting risk
Market risk	100%	25%
Life underwriting risk	25%	100%

A new Board member has commented that “surely combining all the stresses together will result in more, not less, capital required than the sum of the individual stresses, as we are at greater risk from everything bad happening at once”.

- i. Set out the points that you would raise in response to this comment. [8]
- ii. Explain the rationale for the following correlations assumptions from Table B and Table C:
 - Equity and property risk
 - Lapse and non-annuitant mortality risk [3]
- iii. Suggest, with reasons, appropriate correlations between the main risks listed below from Table C. You only need to indicate the direction of each correlation and a qualitative description of the magnitude.
 - Lapse and expense risk
 - Longevity and non-annuitant mortality risk [5]

The new Board member has also questioned the rationale behind the market and life underwriting correlation assumption in Table D. At his previous company (which only sells unitised with profits business with the predominant life underwriting risk being lapse risk), a justification was made that lapse rates reduced when equity markets fell.

- iv. Explain why
 - a. The standard formula uses Table D to quantify this correlation.
 - b. The new director’s previous company may have been able to justify lapse rates reducing when equity markets fall.
 - c. They may have been able to depart from the standard formula. [4]

[Total 20]

[Grand Total 100]

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END OF PAPER