EXAMINATION

28 May 2024 (am)

Subject F102 — *Life Insurance* Fellowship Principles

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. *Download the Word answer document template from the ASSA Exam Platform. Save this Word answer document on your desktop using your Candidate Number as filename. You are required to submit your answers in Word format ONLY using this document. No answers in any other format (e.g. handwritten) will be accepted. Save work regularly.*
4. *Ensure that your Candidate Number appears in the "header" of your Word answer document. [Double-click on the header at the top of the Word document, input your Candidate Number only in the header, then press "Esc" to close the header.]* ***Do not use your name or member number anywhere in your Word answer document.***
5. *You may not access any file from your computer, use any other computer app (e.g., Email or Excel) or open any other browser during the examination. Nor may you use Grammarly, Grammarly Premium or similar add-ins. Microsoft Word spellcheck is allowed.*
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 eight (8) questions, starting each on a new page (as provided for in the Word answer document).*
10. *Show calculations where appropriate. You may use blank paper to carry out rough work calculations. You may use a calculator from the ASSA-approved list only.*
11. *Upload your Word answer document only into the ASSA Exam Platform. Once you have uploaded your document, 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.*** *You should stop writing and start uploading during the last five minutes. 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

You are an actuary at a small life insurer which specialises in health and care insurance products. Currently your company only offers a stand-alone conventional critical illness product which covers the major critical illnesses and pays a once-off lump sum benefit upon claim.

Your company has decided to introduce a tiered benefit structure in place of its current single lump sum benefit structure.

i. Discuss how the product design and pricing requirements differ between the new and existing products.

[5]

One of your colleagues has made the statement that this new tiered critical illness product should be cheaper than the existing non-tiered product.

ii. Comment briefly on the validity of this statement.

[2]

After selling the new product for a year, a pandemic hits the country in which the company operates, resulting in a nationwide lockdown for two months.

iii. Comment on the impact that this may have on the insurer's critical illness claims experience on the tiered product, both during and after the lockdown.

[4]
[Total 11]

QUESTION 2

A newly established life insurance company, in a small developing economy, sells a 30-year conventional with-profits endowment assurance policy in its local market only.

i. Outline the general principles the company would follow in determining an investment strategy for the assets underlying the with-profits endowment assurance liabilities.

[3]

ii. Outline briefly how legislation may impact the company's ability to implement its desired investment strategy.

[2]

iii. Explain how the company should go about determining a suitable investment strategy if it declares terminal bonuses only.

[7]

iv. Outline how the investment strategy would change if the company changed its endowment assurances to offer annual compound reversionary bonuses with lower terminal bonuses.

[3]
[Total 15]

PLEASE TURN OVER

QUESTION 3

i. Explain briefly what is meant by:

   a. An "internal unit-linked fund".
   b. The "basic equity principle" as it applies to the pricing of units. Your explanation should include a brief description of why this principle is necessary.

[3]

ii. Explain briefly the net impact of each of the following on the net asset value (NAV) of an expanding fund, for purposes of calculating the appropriation price of a unit on the day of the transaction or event.

   a. The fund paid R5m for a property, plus transaction costs and duties of R0.5m. The fund transferred existing cash of R2.5m from its bank account and took out a loan for the remaining R3m.
   b. The fund received a final invoice for R100 000 from the fund's auditors.
   c. The insurance company paid the monthly salary of the actuary responsible for designing unit-linked products.
   d. Capital gains tax is introduced for the first time and will apply on all capital gains from a specified future date.
   e. The fund sold some of its equity holdings, the proceeds being paid into the bank account of the internal fund on the same day.

[5]

iii. Outline briefly the conditions that need to be satisfied for actuarial funding to be used.

[3]

The charging structure of a unit-linked product includes a bid/offer spread of 5% in the price of a unit and a fund management charge of 2% per annum. An actuarial student notices that both charges are "unit-related" and concludes that both charges can be actuarially funded.

iv. Comment briefly on the student's conclusion.

[2]
[Total 13]

QUESTION 4

A life insurance company selling only unit-linked business is setting its basis for the annual embedded value (EV) calculation for published reporting purposes. The calculation of the EV is to be carried out on a best estimate basis.

i. Describe the components of the embedded value calculation.

[2]

ii. Explain briefly the principles that should be considered in setting this basis.

[3]

iii. Outline briefly how the company could determine the assumptions for each of the key items required in the embedded value basis. A description of experience investigations is not required.

[8]
[Total 13]

PLEASE TURN OVER

QUESTION 5

The insurance regulator of a particular country prescribes a passive approach for performing the statutory valuation of life insurers in that country.

i. Outline the main features of a passive valuation approach.

[4]

YouSave is an insurer in the country selling conventional without-profits pure-endowment policies and it is about to calculate its statutory reserves using a net premium valuation method.

ii. Outline 4 possible types of data errors (i.e. excluding methodology or assumption-related errors), that could lead to YouSave's reserves being incorrectly calculated, and for each type suggest a check to help ensure the data are free from errors.

[4]

The regulator announces that the statutory valuation from a specific date in the future is to be performed using a gross premium valuation method and an active valuation approach.

iii. Explain the implications of this change for YouSave.

[6]
[Total 14]

QUESTION 6

i. Outline the features of reinsurance written on an original terms basis and that written on a risk premium basis.

[3]

A small life insurer, Company A, that writes predominately group life business is considering entering into a reinsurance agreement to manage its exposure to single events.

ii. State the most appropriate type of reinsurance for Company A to purchase and outline how this type of reinsurance works.

[3]

A large life insurer, Company B, writing a range of individual risk products is considering entering into a reinsurance arrangement to mitigate its insurance risk.

iii. Explain why Company A is more likely to purchase the reinsurance suggested in (ii) than Company B.

[4]
[Total 10]

PLEASE TURN OVER

QUESTION 7

An established life insurance company sells conventional with-profits investment contracts where policyholders share in the investment and mortality surplus with bonuses distributed using the "additions to benefits" method.

i. Outline briefly the different types of bonuses that the company may use.

[2]

The bonuses declared have been lower than in previous years and the company is facing pressure from its policyholders to increase bonus rates.

ii. Discuss likely reasons for the lower bonuses.

[4]

iii. Outline actions the company could take to alleviate future pressure from its policyholders relating to bonus declarations.

[6]
[Total 12]

QUESTION 8

In a developing country life insurance has largely been sold to middle- and high-income individuals. Over the past few years some insurers have expanded to targeting low-income individuals with conventional without-profits funeral cover term assurance, on which the only benefit is a lump sum payment sufficient to cover the funeral costs of the insured.

BigLife, a well-established insurer in this country is considering entering the low-income market. It plans to sell conventional without-profits whole life insurance products, providing funeral cover which will also provide a moderate lump sum death benefit to be paid to the insured's dependants. A surrender value equal to 50% of the premiums paid to date will be offered on surrender of the policy. Underwriting, which will be in line with that carried out by competitors, will be limited compared to BigLife's current underwriting.

i. Outline briefly 8 reasons, relating either to product features or expenses, which would contribute to making BigLife's premiums for this product more expensive than those for the existing funeral cover policies offered by competitors.

[4]

ii. Outline the risks that offering this product exposes BigLife to in respect of:

a. mortality;
b. expenses; and
c. withdrawals.

[8]
[Total 12]

END OF PAPER