

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

15 April 2024 (am)

Subject SP2 – Life Insurance Specialist Principles

Time allowed: Three hours and twenty minutes

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator.

If you encounter any issues during the examination please contact the Assessment Team on T. 0044 (0) 1865 268 873.

1 A life insurance company has recently performed an exercise analysing persistency experience over the past 5 years. The following observations have been made:

- Persistency has reduced across all products in the most recent year compared to the previous years.
- Unit-linked bond policies experienced poorer persistency than unit-linked pension policies at equivalent policy durations.
- Annual premium policies experienced better persistency than monthly premium policies at equivalent policy durations.

There has been an economic downturn over the past 12 months, with price inflation increasing, and this is expected to continue.

Discuss the possible drivers behind each of the observations listed above. [6]

2 Genetic testing has recently become cheaper and more common in Country Y. There are two main types of genetic tests available in Country Y:

- Predictive tests that can identify if an individual is likely to be at a higher risk of getting certain health conditions, including some types of cancer or heart disease, with reasonable accuracy
- Specific genetic tests that can identify a small number of rare hereditary conditions that could have severe implications on an individual's lifespan and are very accurate.

Company A is a life insurance company operating in Country Y and sells term assurance and immediate annuity business. Company A is concerned about the impact of increased use of genetic testing by consumers.

(i) Describe how increased use of genetic testing may alter the risks that Company A is exposed to. [2]

(ii) Discuss the possible actions Company A may take in relation to genetic testing. [6]

[Total 8]

3 A life insurance company has recently introduced a 'pure endowment' – an endowment product that does not offer any benefit on the death of the policyholder during the term the policy is in force.

(i) Suggest possible reasons why the life insurance company may offer this product instead of an endowment assurance featuring a death benefit. [4]

(ii) Describe the key risks to the policyholder associated with the product. [4]

[Total 8]

4 A life insurance company has sold unit-linked business for several years and started selling decreasing term assurance products 3 years ago.

The company invests the assets backing its liabilities in a mix of equities, property and index-linked bonds. It does not invest the assets backing its liabilities in cash or fixed interest assets.

(i) Suggest possible reasons for the company's chosen investment strategy. [5]

The company is considering performing dynamic solvency testing.

(ii) Discuss why the company may wish to perform dynamic solvency testing. [7]

After performing dynamic solvency testing, the company has identified that a key risk is high early withdrawals on its decreasing term assurance product.

(iii) Suggest ways that the company could minimise the risk of high early withdrawals on its decreasing term assurance product. [5]

[Total 17]

5 A life insurance company has decided to market with-profits business where the method of bonus distribution is via the contribution method.

Suggest possible reasons for the company's decision, from a customer perspective, for using the contribution method. [4]

6 (i) List the main factors by which a life insurance company would typically subdivide data when analysing withdrawal experience. [4]

A life insurance company has just performed a high-level analysis of the previous year's withdrawal experience. The company operates in two countries and has found that the high-level withdrawal experience in one country now appears to be significantly worse than the other.

(ii) Suggest further analysis the company could carry out to better understand the drivers behind this difference in experience. [8]

(iii) Discuss the possible further actions the company could take in response to this analysis.

[**Note:** You are not required to discuss ways in which the actual withdrawal experience could be managed.] [4]

[Total 16]

7 Company B, a life insurance company, has recently purchased an automated underwriting system from its main reinsurer. Company B intends to use the automated underwriting system to support the new business process for its term assurance business.

(i) Discuss the possible implications for Company B of implementing this system. [6]

(ii) Describe the possible benefits to the reinsurer if Company B implements this system. [3]

[Total 9]

8 A mutual life insurer holds a book of conventional with-profits whole life assurance policies. This is now closed to new business. Profits are distributed as additions to benefits via compound regular reversionary bonuses and a terminal bonus.

(i) Suggest reasons why the mutual might have adopted a compound approach to distributing bonuses. [5]

The policies have a guaranteed sum assured payable on death. The surrender value is equal to the asset share, subject to a surrender penalty that is applicable in the first 5 years of the policy.

(ii) Set out how the company could calculate the asset share for each policy. [6]

In aggregate, the guaranteed death benefits exceed the asset share for the whole life assurance business.

The mutual has significant levels of free assets but is concerned about the risk of losses in the event of a significant increase in mortality. They would like to protect against this risk without reducing bonuses.

(iii) Describe suitable reinsurance arrangements to achieve this aim. [3]

(iv) Discuss the mutual's other options to reduce the risk of losses in the event of a significant increase in mortality. [3]

[Total 17]

- 9 A life insurance company is setting a best estimate assumption for the future level of renewal expenses for its actuarial liabilities. The renewal expense assumption is set at a product level.

The team setting the expense assumptions have been provided with expense data at the following levels of detail:

<i>Type of expense</i>	<i>Level of detail</i>
Renewal commission	Product level
Initial expenses	Product level
Renewal expenses – direct	Product level
Renewal expenses – overheads	Not split to a product level

- (i) Define ‘direct expenses’ and ‘overheads’. [1]
- (ii) Explain, with reasons, whether each type of expense from the table above will be included or excluded in the renewal expense assumption calculation. [4]

Renewal expenses include staff- or salary-related costs. Staff costs can be split into three groups:

- A Staff whose work covers one product line
B Staff whose work covers more than one product line
C Other staff.

- (iii) Explain how the salaries of staff in Group B could be allocated by product. [1]

The team is considering how to split ‘renewal expenses – overheads’ by product level.

- (iv) Suggest possible approaches that could be used to allocate the different types of overheads by product. [5]

Price inflation in the country where the life insurance company is based has been stable and at historically low levels for several years. However, price inflation has been increasing over recent months and is currently at four times the price inflation at the previous year-end. Market analysts are predicting that price inflation will remain at these high levels for the next 2 years.

- (v) Discuss the impact of higher expected price inflation when setting and modelling the firm’s maintenance expense assumption. [4]

[Total 15]

END OF PAPER