EXAMINATION

29 May 2014 (am)

Subject F102 — *Life Insurance*
Fellowship Principles

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

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

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 all seven (7) questions, beginning your answer to each question IN A SEPARATE BOOKLET.*

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

AT THE END OF THE EXAMINATION

Hand in your answer booklets, with any additional sheets firmly attached to the correct booklet, 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.

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QUESTION 1

LL Life Assurance is a medium-sized profitable life insurance company with a sizeable in-force book of term and whole life assurances. To date the insurer has not made use of any reinsurance arrangements. The company has decided to embark on a large scale expansion strategy that will include new products and risks, aggressive marketing as well as increasing underwriting capacity and new systems.

i. Explain how asset-enhancing reinsurance may be used to fund the expansion and why this might be preferable to obtaining a loan.

[4]

One of the new products that will be launched will be a critical illness (CI) product.

ii. Outline the reasons for LL Life Assurance to consider entering into a proportional reinsurance arrangement on the CI product.

[4]

iii. Suggest, with reasons, three parties, other than the management of LL Life Assurance and its reinsurers, who will be interested in the reinsurance arrangements of the company.

[3]
[Total 11]

QUESTION 2

A medium-sized life assurance office has sold a core benefit critical illness policy for a number of years. The insurer is aiming to launch a new comprehensive critical illness product. The product will cover 40 pre-specified illnesses (including the four core benefits) and will use a tiered benefit payout structure, i.e. the payment varies between 0% and 100% of the sum assured depending on the severity of the condition. Rates on the product will be guaranteed for 10 years.

i. List the four medical conditions that are likely to be covered by a core critical illness product.

[2]

ii. Outline the difficulties that the company is likely to face when pricing and administering the proposed comprehensive critical illness product.

[11]
[Total 13]

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QUESTION 3

A medium-sized life insurance company operating in a developing country, where there is a high prevalence of HIV/AIDS, sells conventional life assurance business targeted at the middle and upper income segments.

There is a growing demand in the country for interest-only mortgage loans in this market segment. The company plans to launch a new unit-linked endowment assurance product aimed at providing death and maturity benefits for people taking out these interest-only mortgage loans. The product will be sold through independent intermediaries.

The new product will have the following characteristics:

- Death benefit: The higher of the value of the mortgage and the value of the unit fund.
- Surrender value: The value of the unit fund less a surrender penalty.
- Maturity benefit: The value of the unit fund.
- Term: Duration of the mortgage.
- Allocation rate 90% throughout.
- Risk benefit charge (in respect of any excess of the guaranteed sum assured over the value of units in the unit fund): Variable at the discretion of the insurer.
- Other charges: None.
- Premiums: Level monthly premiums (guaranteed for first 5 years).
- The investment portfolio of the unit fund has been selected so that the accumulated unit fund at maturity will cover the initial mortgage at a reasonably conservative rate of unit growth.
- Initial underwriting will be limited to a declaration of health to be completed by the prospective policyholder.

i. Outline the primary risks this venture entails for the life office.

[12]

ii. Outline briefly the method the company could use to reduce new business strain, stating the general constraints that may be imposed for this method to be used.

[5]

[Total 17]

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QUESTION 4

A life office sells conventional without-profit life assurance policies. These policies were originally sold to high-income individuals through independent brokers. Six years ago the insurer entered into a relationship with a bank with middle-income clients, where bank sales staff sell policies from the existing product suite. The insurer has experienced high sales volumes from bank customers and has been experiencing high levels of requests for policy alterations from these customers.

i. Comment briefly on the appropriateness of the following proposed bases for each of the alterations to recurring premium policies described below.

   a. A policyholder wishes to halve his premium four years into a 20-year endowment assurance policy and reduce the term by 5 years.
      The company plans to take the retrospective earned asset share and apply this as a single premium to secure benefits under the altered policy. The single premium rate to be used will be the normal single premium for a similar new policy, and the extra benefits arising from future premiums will be secured at normal premium rates. A specific deduction will be made from the asset share to cover the administrative costs of the alteration.

      [2]

   b. A policyholder wishes to halve his sum assured five years into a 10-year term assurance policy.
      The company plans to equate policy values before and after the alteration on a realistic prospective basis, except for a realistic allowance for the cost of the alteration which will be deducted from the policy value before the alteration.

      [2]

   c. A policyholder wishes to double his premium six years into a 20-year endowment assurance policy.
      The company plans to equate policy values before and after the alteration on the original premium basis for the altered contract.

      [2]

The insurer's distribution manager has suggested that the insurer should develop new tailored term assurance and endowment assurance products for bank customers. You have been given the task of setting the assumptions for the new products.

ii. Describe briefly the process that you would follow in setting the withdrawal assumptions for the new endowment assurance product.

[4]

[Total 10]

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QUESTION 5

You work for a young life insurance company which sells whole life and critical illness policies. The insurer uses a direct distribution channel focusing on out-bound sales. The company buys lists of credit-card and store-card holders (referred to as 'leads') containing the contact details of the cardholder. The life insurance company's call centre then contacts these individuals telephonically in an attempt to sell life insurance policies to them.

i. The insurer has decided to use a limited set of underwriting questions, on the strength of which it will accept, decline or limit the benefits.

   Suggest possible information about the customer that could be gathered using these questions and comment on how this underwriting should be included in the telephonic sales process.

[3]

One of the concerns of the business manager is that not every lead is converted into a call and not every call is converted into a sale. He is eager to assess whether this distribution approach is successful and to investigate whether there are ways to improve the process. He has commissioned an investigation into the sales experience and has proposed using the ratio of the number of sales to the number of calls as a starting point for analysing the experience.

ii. Suggest, with justification, another simple ratio that could be used to analyse the sales experience.

[1]

iii. List factors that could be used by the insurer to divide the past sales experience data into homogeneous groups.

[4]

iv. Explain why it is important for the company to monitor this sales experience.

[6]

[Total 14]

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QUESTION 6

The insurance regulator of a particular country has commissioned a review of insurance regulations and the insurance industry, with a view to implementing a tighter regulatory regime.

i. List typical restrictions that a regulator can impose on the business of life insurers, over and above reserving and solvency requirements and asset limitations.

[4]

The findings of the review indicated that competition in the market for savings products provided by insurers is not optimal. The regulator has stated that one of the main reasons for this is that the charging structures of savings products are too complicated, which makes a like-for-like comparison of the costs of the various providers' savings products too difficult.

The regulator has proposed that only two types of charges should be allowed on new savings products, namely a monetary amount per month and a percentage of premium(s), both of which must be level for the full duration of the policy. Providers could determine the level of the charge.

ii. Discuss the potential impact of this proposal on the factors that an actuary would consider when designing a product. Assume that the savings products do not offer any protection benefits.

[11]
[Total 15]

QUESTION 7

A life company that sells only conventional (additions to benefits) with-profits endowment assurance business has been using the Gross Premium Valuation method to calculate its reserves using a formula approach. The valuation actuary is considering changing to a discounted value of future cashflows method for calculating its reserves.

i. Outline the advantages and disadvantages to the company of using a cashflow method over the formula method to calculate its reserves.

[4]

The marketing director has received numerous complaints about the level of the (compound) reversionary bonuses declared by the company. Reversionary bonus levels have consistently been 4% per annum. Inflation has steadily increased over recent years to 6% per annum, where it is widely expected to remain in the future. The office premium is based on an investment return of 5% per annum, while returns have been, and are expected to remain, 10% per annum. The formula method does not make explicit allowance for future bonuses, and uses a discount rate of 5% per annum. Assume that all other experience items are similar for both the premium and valuation bases. The marketing director proposes that (compound) reversionary bonuses should be increased to 6% per annum.

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ii. Comment on the feasibility of the marketing director's proposal.

[5]

The realistic balance sheet of the company is summarised below:

Balance sheet	**R millions**
Assets	
Local equities	275
Offshore equities	23
Direct property	50
Fixed Interest	556
Cash	151
Total Assets	**1055**
Liabilities	
With-profit - SA+RB declared	400
- RB future	200
- TB future	205
Total Liabilities	**805**
Surplus Assets	**250**
Surplus Assets consist of the following items	
Minimum Solvency Requirement	83
Free Assets (after Minimum Solvency Requirement)	167
SA - Sum assured RB - Reversionary Bonus TB - Terminal Bonus	

The marketing director suggests that equity holdings should be increased to achieve a higher investment return.

iii. State the principles of investment that a life insurer should adhere to when determining its investment strategy.

[2]

iv. Discuss the appropriateness of the company's investment strategy and comment on the marketing director's suggestion, given the current level of surplus assets. State briefly how your answer would differ if the surplus assets were equal to the minimum solvency requirement prescribed by the regulator.

[9]

[Total 20]

END OF PAPER

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