EXAMINATION

31 May 2012 (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 eight (8) 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.

QUESTION 1

A life insurance company is analysing the withdrawal experience on its unit-linked endowment assurance business.

i. State eight reasons why the company might carry out such an analysis.

[4]

ii. Outline briefly reasons why the current experience might not be indicative of future experience.

[4]
[Total 8]

QUESTION 2

A mutual life office has large, established portfolios of with-profit and unit-linked endowment assurances. Surplus is distributed to the with-profits policies by means of terminal bonuses and annual compound reversionary bonuses, which are smoothed.

It has been suggested by an actuarial student that smoothing be reduced and that reversionary bonuses more closely reflect investment returns.

Discuss the implications of the suggested change in surplus distribution policy for the company and policyholders.

[8]

QUESTION 3

LifeCo writes its conventional whole of life policies targeted at low-income consumers through insurance brokers. There is limited underwriting on these policies and insurance brokers are remunerated solely through initial commission on the sale of the policy. The distribution manager has suggested that LifeCo introduces a new commission scale where higher levels of commission are paid to brokers that have been identified as "key brokers".

i. List four criteria LifeCo might use to define "key brokers".

[2]

ii. Outline briefly the advantages to the insurer of adopting the "key broker" approach.

[2]

iii. Discuss the risks to the insurer of introducing the new commission scale and how the insurer can manage these risks.

[6]
[Total 10]

PLEASE TURN OVER

QUESTION 4

SouthernRock is a large insurer specialising in credit life assurance on home loans. Due to the economic climate, many policyholders are extending the term of their mortgages, and consequently the term on their credit life assurances. The manager of the Mortgage Credit Life Assurance division is worried about this trend and has asked you to investigate the alterations to policy terms.

i. List the checks you would carry out on the policy data for the purpose of reporting on the alterations to policy terms.

[3]

ii. Describe how you would investigate the recent trends in the alteration experience.

[4]

Your findings suggest a material increase in policy term to maturity. Consequently, you have decided to alter your investment strategy.

iii. Describe how asset-liability modelling can be used to test the probability of insolvency for a specific investment strategy.

[4]

iv. State what implications the lengthening in policy term is likely to have on the insurer's investment strategy.

[3]

[Total 14]

QUESTION 5

i. Define what is meant by the term "internal unit-linked fund".

[1]

ii. Describe the principal risks for a life insurance company in determining the unit price on an internal unit-linked fund.

[6]

iii. Briefly explain the criteria that must be satisfied in order for a company to use actuarial funding to reduce the new business strain on their unit-linked endowment assurance products.

[5]

[Total 12]

PLEASE TURN OVER

QUESTION 6

You are the product development actuary working for a life insurance company which focuses on the low income market in a developing country. You are designing a 10-year term assurance product that, in addition to a death benefit, pays policyholders a fixed lump sum for each day (beyond the third) they are hospitalised. Level monthly premiums are payable for the duration of the contract. Premiums are based on age at entry (to a maximum age of 60) and vary in 10-year age bands (i.e. 21-30, 31-40, etc.).

Initial underwriting is limited to two simple underwriting questions which aim to establish whether the policyholder is reasonably healthy at the time of applying for the contract and is not intending to seek medical advice in the three months following the application.

i. Describe the cross-subsidies that exist in this product design.

[4]

ii. Outline how the existence of cross-subsidies impacts on the factors that need to be considered in designing the product.

[8]
[Total 12]

QUESTION 7

A life insurance company wishes to introduce a guaranteed insurability option on its term assurance product. All policyholders will pay a premium for the option and on expiry of the original policy term, they can take out a new policy on the then standard premium rates without evidence of health.

i. Discuss briefly the advantages and disadvantages of this proposal to the company.

[2]

ii. Suggest ways the company could manage the risks associated with the option.

[6]

iii. Explain the key assumptions necessary to price the option, and outline how the pricing actuary should go about setting these assumptions.

[9]
[Total 17]

PLEASE TURN OVER

QUESTION 8

A recently-established life insurance company intends to issue regular premium unit-linked individual income protection (long-term sickness) contracts. Several of the country's largest life offices have been involved in this market for some years.

Units will be cancelled regularly to meet the risk premiums and expense charges. The office will retain the right to vary the risk and expense charges to reflect experience, and office premiums are to be reviewed on a 5-yearly basis.

The risk benefit is a fixed amount to be determined at outset, but the policy also provides a premium waiver during a claim, with unit allocations and cancellations continuing. On death, surrender or at the end of the policy term the policyholder will receive the bid value of the units (although this is not expected to be a significant amount).

i. Describe the advantages and disadvantages of the proposed product design to the policyholder compared with a traditional non-linked income protection (long-term sickness) product.

[6]

ii. List the major features on which income protection (long-term sickness) contracts are sold.

[2]

iii. Outline the risks faced by the life office in respect of expenses

[3]

iv. Suggest types of risk reinsurance which the office may wish to put in place, outlining the reasons for each.

[8]

[Total 19]

END OF PAPER

