EXAMINATION

5 November 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 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.

QUESTION 1

The dominant life insurer in a small developing country sells mainly group life business to clothing manufacturers and construction companies. The standard group life cover provides a benefit of twice annual salary on death. Mortality assumptions used in determining the premiums for the group life cover are reviewed annually taking into account the experience of each insured scheme. The insurer is considering expanding the number of rating factors that it uses for group life premium rates.

i. Outline the likely automatic-acceptance criteria for the group life cover.

[2]

ii. List the sources of medical information that could be used to underwrite individuals with high sums insured.

[2]

iii. Describe the process the pricing actuary would follow for reviewing the group life mortality assumptions.

[4]

A mortality analysis reveals poor experience in the insurer's schemes for construction companies. The insurer is considering increasing the premium rates for these schemes. This would result in the rates being higher than those charged by its competitors.

iv. Outline briefly the risks to the insurer of increasing premium rates for construction companies above those of its competitors.

[2]
[Total 10]

QUESTION 2

In recent years Wide Horizons Life Company has experienced diminished retained earnings and free assets. The company is planning to expand its without-profits term assurance policies to two new provinces within the same country, but is concerned that this business expansion will put pressure on its solvency levels.

i. State the reasons why expansion of the business may put additional pressure on the solvency of the insurer.

[2]

ii. Explain how reinsurance could reduce this pressure.

[6]

iii. State other advantages that using reinsurance may have for the company.

[4]
[Total 12]

PLEASE TURN OVER

QUESTION 3

You are the actuary of a specialist captive insurer (GHI) that was established by High Finance Bank (HFB) to provide instalment protection policies to individuals taking out home mortgages with HFB. Borrowers are compelled to purchase instalment protection policies from GHI with the bank as beneficiary in order to cover mortgage repayments during periods of incapacity. Mortgages are repaid by monthly instalments of capital and interest, and are variable rate, i.e. repayments vary with interest rates. GHI's instalment protection policies are without-profits policies with guaranteed premium rates.

The instalment protection benefit at inception is equal to the initial level of the mortgage repayment. The benefit level is revised annually to be in line with the then current mortgage repayment. The premium is also adjusted annually to reflect the revised benefit level. Incapacity is based on occupational definitions and there is no deferred period.

Your finance director notes that there has been a reduction in the return on capital of the product as a result of higher claims experience, and he suggests that the business should be reviewed. He suggests reviewing the rating factors and that a three-month deferred period be introduced, in line with common industry practice.

i. List, with explanations, the demographic factors that could impact on the claim inception and/or termination rates.
[5]

ii. Outline briefly the purposes of a deferred period for instalment protection policies.
[2]

iii. Discuss the merits of the director's suggestion to introduce a deferred period.
[3]

iv. Suggest other changes that GHI could consider to improve the return on capital of the product, outlining briefly the potential risk to GHI of each proposal.
[8]

[Total 18]

PLEASE TURN OVER

QUESTION 4

The Chief Actuary of People's Life Insurer has commissioned a review of the surrender terms of its individual regular premium without-profits endowment assurance policies. This product is sold to government employees and cover is terminated if the policyholder moves to the private sector.

Surrender values are calculated using asset shares at early durations and a prospective policy value thereafter. The use of asset shares results in low surrender values at early durations, compared to premiums paid.

i. Describe, without the use of formulae or diagrams, the prospective value methodology and how suitable assumptions might be determined for surrender values.

[7]

ii. Outline the risks to the insurer of continuing to use the current methodology for determining surrender values.

[3]

[Total 10]

QUESTION 5

A life insurer has a large book of 15-year annual premium unit-linked endowment assurance policies. Commission to sales agents is 50% of each of the first two premium payments. Furthermore, 95% of each premium is allocated to the unit fund and there is a fixed annual management charge of 5% on this unit fund.

The benefits under the policy are structured as follows:

- Death: maximum of the bid value of the units or 100% of premiums paid
- Maturity: maximum of the bid value of the units or 110% of the premiums paid
- Surrender: bid value of the units less a surrender penalty (the surrender penalty starts at 15% of the value of the unit fund and reduces over the term of the policy)

A change in the regulatory environment has led to higher levels of required capital for insurers and pressures on this insurer's solvency position.

i. Describe two methods that can be used to determine the cost of the investment guarantees to the insurer.

[5]

ii. Outline the weaknesses of the current charging structure.

[8]

iii. Describe how actuarial funding may be used to address some of these weaknesses.

[5]

[Total 18]

PLEASE TURN OVER

QUESTION 6

A life insurance company in a particular country sells with-profit endowment assurance policies with bonuses distributed using the "additions to benefits" method. Currently a large proportion of the surplus distributed by the company is in the form of terminal bonuses.

The supervisor of financial services institutions is planning to introduce new regulations requiring all reversionary bonus rates to be at least as large as the local Consumer Price Index (CPI) inflation rate.

i. Describe an appropriate asset mix for the with-profits policies of the insurer before the introduction of the new regulations.

[3]

ii. Outline the possible implications of the proposed new regulations to the company and possible responses by the company and its policyholders.

[9]

[Total 12]

QUESTION 7

A newly established insurance regulator in a developing country has been given the mandate to develop regulations for assessing the financial soundness of life insurers. These regulations will include setting requirements for valuing the assets and liabilities and determining the minimum solvency capital of life insurers. The government has set the following policy objectives for the insurance regulatory framework:

> "The objectives of the insurance regulatory framework are to grow a healthy life insurance industry and to protect policyholders."

i. Discuss the principles that the regulator should take into account when setting the requirements for assessing the financial soundness of insurers.

[10]

ii. Outline briefly the restrictions that the regulator may impose with regards to treating customers fairly.

[4]

iii. Describe how the approach taken to valuing insurers by investment analysts, who publish quarterly reports for potential investors, might differ from the approach taken by the regulator in assessing financial soundness.

[6]

[Total 20]

END OF PAPER