EXAMINATION

1 November 2011 (am)

Subject F202 — Life Insurance
Specialist Applications

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

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

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 questions, beginning your answer to each subquestion on a separate sheet.*

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

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet, with any additional sheets firmly attached, 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

You are the pricing actuary at a medium sized insurance company which currently only sells simple risk products (term assurance and funeral products). The marketing director has approached you with a suggested unit linked product idea. The director indicated that she feels there is a gap in the market for a more traditional type of unit linked product. In particular, one where the emphasis moves back to providing an insurance orientated product with the policyholder getting the benefit of exceptional market performance.

She suggested the following key features of the product:
- A fixed term endowment product providing the policyholder with the greater of the sum assured and the unit account on death during the term.
- No bid/offer spread.
- Early surrender charges.
- Risk charges guaranteed for a period of 5 years.

i.   Discuss how you would go about pricing the unit linked product.   [19]

ii. During the presentation of the results to the director she mentioned that a friend of hers (an actuarial student) has suggested that you can ignore withdrawals when pricing new products. The reasons she gave is that the surrender value will not exceed the statutory reserve; hence a profit will emerge on withdrawal. Discuss the suggestion.   [5]

Following a few years of good sales (including the new unit linked product) and relatively stable economic circumstances, both fixed interest rates and the outlook for future equity dividend rates suddenly reduce. Consequently the investment return assumption for the company is adjusted downwards.

iii. Explain how the reserves and the embedded value of the company will be affected following the change in the economic circumstances.   [16]

[Total 40]

QUESTION 2

The regulator of life insurance companies in South Africa is considering a capital assessment regime under which a pure risk based capital approach is followed, based on a full internal model covering all risks faced by the insurer. (An 'internal model' implies that each insurer will create its own model to quantify the risks faced by its business.)

i.   Discuss this suggestion, including the merits of a full internal model compared to a standard model approach such as CAR.   [10]

ii. List the components that comprise IOCAR, as well as the risks that are not explicitly allowed for in the CAR calculation. Formulae are not required.   [4]

iii. List the falls in the fair value of assets backing the liabilities prescribed by PGN104.   [4]

Total [18]

QUESTION 3

You are the Statutory Actuary of a large South African life insurance company. When an endowment policy approaches maturity, the company offers the policyholder a continuation option. Under the option, the policy is continued as a unit-linked single premium endowment. The endowments provide a fixed monthly income and a lump sum maturity benefit at a newly selected maturity date. The fixed monthly income (funded by the sale of units) was determined at the continuation date such that the projected maturity benefit was equal to the continuation amount (i.e. the maturity value of the original endowment). However, the new maturity value was not guaranteed. The assets are invested in a balanced fund.

Many of the options were exercised at a time when inflation rates and investment returns were higher than those that were actually experienced since the options were exercised, or those expected in the future. As a result, the projected maturity proceeds under many of the policies have now fallen below the continuation amount. The company has decided to offer some form of compensation to the affected policyholders.

Three possible compensation packages have been identified:

• Option A: Introduce a guarantee that the maturity value under the policy will be at least equal to the continuation amount. No charge would be made for the guarantee, and the investment strategy would be unchanged.

- Option B: Introduce a conditional guarantee that the maturity value will at least equal the continuation amount provided that the average investment return net of tax on the balanced fund over the remaining term of the policy is at least 8% p.a. Where the return falls below 8% p.a., compensation would be limited to the shortfall, if any, that would have arisen if the return had been 8% p.a. Again, no charge would be made for the guarantee, nor would the investment strategy of the balanced fund be changed.

- Option C: Make a limited time offer to pay an enhanced surrender value under the policy. The enhanced surrender value would be the greater of the contractual surrender value and the continuation amount.

i. Discuss the possible financial implications to the company of each of the compensation packages. You should describe any investigations you would perform to assess the implications.
   - Option A [16]
   - Option B [6]
   - Option C [7]

ii. Describe the relative advantages and disadvantages to the company and the policyholders of each of the compensation packages. [13]

Total [42]

Grand Total [100]

END OF PAPER