EXAMINATION

1 October 2007 (am)

Subject SA1 — Health and Care 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 three questions, beginning your answer to each question 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.

1 You are the distribution actuary working within a health insurer.

(i) (a) Describe the different types of direct distribution available to a health insurer

(b) Outline the costs associated with each of the above.

[8]

Your company has the following remuneration structure agreed with a key distributor.

Business line	*Commission*
Private Medical Insurance	An annual payment from the insurer to the distributor based on the number of policies sold by that distributor in the year. The payment is doubled if sales in a given calendar year exceed 1000 policies sold.
Income Protection	50% of year one premium paid in a lump sum on receipt of the policy application.
Critical Illness	5% of monthly premium paid throughout the life of the contract, on receipt of each premium

(ii) Comment on the suitability of this structure, indicating for each product the implications for the distributor, the customer and the insurer.

[20]

[Total 28]

2 You are a consulting actuary and have been asked by your UK client PQR plc to report on their post-retirement plan which they have been providing for several years. The plan provides private medical expenses for some of their retirees. In particular, you are invited to report on the cost of the post-retirement liabilities in accordance with the Guidance Note GN21 for Post-Retirement Medical Plans.

(i) List the reasons why a company would wish to provide a private medical expenses plan for its retirees. [2]

(ii) List the disadvantages to a company of providing such a plan. [4]

(iii) List the information that you require from PQR plc to compile your report. [5]

(iv) Describe the methodology and assumptions that you should follow in determining the accrued liabilities and periodic costs of this post-retirement medical plan on the premise that it is not insured considering

(a) the actuarial techniques employed
(b) the sub-division of data into relevant groups
(c) the assumptions regarding future medical costs
(d) expenses
(e) taxation
(f) mortality and other assumptions
(g) credibility

[9]
[Total 20]

 PLEASE TURN OVER

3 You are an actuary working for a large proprietary UK life and health insurer that sells an accelerated critical illness plan covering a wide range of conditions including cancer, heart attack and stroke. In the last three years the company has paid around 2,500 claims under the accelerated critical illness plan.

You have been asked to consider a new product design which pays a benefit on the diagnosis of cancer only or on death from any cause.

The benefit payable on cancer is dependent on the severity of the cancer.

- If the cancer is diagnosed at a very early stage the benefit is 25% of the sum assured and the sum assured is reduced to 75%.

- If the cancer is diagnosed at an intermediate stage the benefit is 50% of the original sum assured less any early cancer payment (i.e. 50% reduced to 25%) and the remaining sum assured is reduced to 50%.

- If the cancer is diagnosed at an advanced stage 100% of the sum assured is paid less any previous payments

Only one payment may be made at each stage so that the maximum payout is 100% of sum assured.

The remaining sum assured is payable on death.

Premiums are guaranteed throughout the term of the policy (maximum term 25 years). The maximum sum assured at issue is limited to £500,000.

This type of plan does not currently exist in the market.

The UK government publishes an annual cancer register which details the number of cases of cancer that have been diagnosed in the calendar year. The data is subdivided by age, sex, cause of cancer and is split between first ever occurrences and all occurrences. There is also an annual publication detailing deaths split by cause.

(i) Describe the customer needs that are met by the proposed product design, contrasting this with the needs satisfied by a typical UK accelerated critical illness contract. [6]

(ii) Suggest with reasons a target market and an appropriate distribution channel for this plan. [4]

(iii) (a) List the changes, if any, that would need to be made to the scope of the cover for the plan to satisfy the ABI requirements to be called Critical Illness.

(b) List any additional requirements that the ABI Critical Illness Statement of Best Practice imposes on the design of a Critical Illness plan. [3]

You have been asked to advise upon the construction of a profit test model for the new product.

(iv) Give a formula for calculating the risk charge which could be applied to a policyholder who has not previously made any claim under the contract describing how you would adjust any population data so it is applicable for your target market and defining all of the terms used in the formula. [9]

(v) Describe how you would allow for tax within the profit test model. [3]

You have been asked to draft a tender request for reinsurance terms.

(vi) Suggest, with reasons, an appropriate reinsurance structure for this product. [6]

(vii) Describe the main requirements under the Integrated Prudential Sourcebook ("PRU") relating to the calculation of mathematical reserves for a long term insurance product, explaining why the calculation of mathematical reserves for the proposed new contract is more complicated than for a traditional critical illness plan. [9]

(viii) Outline the Pillar 2 (ICA) framework applied to an insurance firm giving examples of the risks that a firm must access under Pillar 2. [8]

(ix) Discuss the insurance risks that are particularly relevant to the new cancer product. [4]

[Total 52]

END OF PAPER