INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

24 April 2017 (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 must not start writing your answers in the booklet until instructed to do so by the supervisor.*

3. *You have 15 minutes of planning and reading time before the start of this examination. You may make separate notes or write on the exam paper but not in your answer booklet. Calculators are not to be used during the reading time. You will then have three hours to complete the paper.*

4. *Mark allocations are shown in brackets.*

5. *Attempt all three questions, beginning your answer to each question on a new page.*

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.

1 A large well established health insurer sells income protection (IP) policies online.

The managing director has heard about wearable devices and thinks that they could be used to gather underwriting information about new and existing policyholders.

Policyholders would be given a small device, like a watch, which they will need to wear continuously.

The company has decided to carry out a three year trial of the wearable devices. During the trial the company will continue to offer its current IP product, which will not be re-priced, to all new policyholders. Potential policyholders will be asked to choose which of two underwriting options they prefer:

Option 1 The current point of sale and claim stage underwriting.

Option 2 Complete a simplified online application form and if accepted they will receive a device which they will wear throughout the duration that their policy is in force. There will be no further underwriting or claim stage underwriting.

(i) Suggest the health related data that the device could capture. [5]

(ii) List the underwriting data that should be requested in the simplified application form. [4]

(iii) Describe the technical issues that the company must address before starting the trial. [10]

(iv) Outline the advantages to the policyholder of choosing Option 2. [3]

Some potential policyholders have expressed concern that the devices are intrusive.

(v) Suggest possible areas where policyholders would have concerns about their privacy. [3]

The company has decided it will only offer one of the two underwriting options after the trial has ended.

(vi) Outline the factors that should be considered, during the trial, in order to decide which single option the company will continue to offer once the trial has finished. [9]

Three years later the data has been analysed and the trial has been declared successful. The company will stop selling its underwritten (i.e. Option 1) IP product and will now only sell the Option 2 IP policy. The option will be the same as the one in the trial but, in addition to the "no further underwriting or claim stage underwriting" promise, the premium charged to each policyholder will be a personal price based on their perceived level of healthiness as measured by the device.

(vii) Suggest possible ways in which the company could reduce the morbidity risks arising from writing just Option 2 IP business. [8]

[Total 42]

2 A large UK health and care insurer has implemented its Solvency II model and is reviewing its approach to modelling operational risk. The insurer considers operational risk to be “the risk of loss arising from inadequate or failed internal processes, people, systems or external events”. The insurer currently uses a standard formula approach to model operational risk.

(i) Describe how operational risk is allowed for in the standard formula approach to the calculation of the Solvency Capital Requirement. [2]

The insurer has decided to build an internal model for operational risk that it will also use to obtain regulatory approval.

(ii) Describe the key challenges involved in building such a company-specific internal model for Operational Risk. [10]

(iii) Propose four methods that could be used to quantify operational risk using the company-specific internal model. [4]

The insurer has a wide range of products (legacy products) that are now closed to new business. The insurer has entered into an administration agreement with a third party who will administer these products.

(iv) Explain why the insurer may have entered such an agreement. [3]

Under the third party arrangement the insurer has agreed to pay an annual charge per policy that will increase at a fixed rate of 5% per annum irrespective of the product type. The annual charge at the start of the administration agreement is 110% of the annual policy expense loadings of the legacy products assumed in the insurer’s latest embedded value.

(v) Discuss the possible financial implications on the insurer’s embedded value.

[5]

[Total 24]

3 (i) State the key recommendations of the Dilnot Commission on long term care funding. [3]

A health and care insurance company has launched the following pre-funded single premium unit-linked long term care (LTC) insurance product. Under the product the single premium is invested in two parts:

Guaranteed part

Part of the premium is invested in a Special Fund that provides a guaranteed level of income payable whilst the insured satisfies the LTC condition. The guaranteed income amount is based on the amount invested in the Special Fund, the age of the insured at the commencement of the policy and the impairment level of the insured.

Non-guaranteed part

The remainder of the premium is invested in a range of unit-linked funds that the insured selects. The insured selects a level of income that will be payable while the insured satisfies the LTC condition. Morbidity charges are deducted monthly from the unit linked funds to cover the LTC cost. The morbidity charge depends upon the income level chosen, and the current age and impairment level of the insured.

The LTC condition is satisfied when the insured cannot complete any three of the six activities of daily living (ADL's) set out in the policy. When in payment, the income payments to cover LTC costs increase at the rate of increase in the Consumer Prices Index (CPI) per annum. The policy includes various charges, including an administration charge and an investment management charge. If the policyholder dies before the LTC condition is satisfied the policy provides a death benefit equal to the greater of the initial investment (i.e. the full single premium paid) and the bid value of the unit-linked funds held.

(ii) Describe the risks that the insured is exposed to in terms of covering their long term care costs. [9]

(iii) Describe the risks to the insurance company of selling this product. [16]

After one year from the product launch, the insurer has sold only 100 policies and decides to stop offering this product.

(iv) Discuss the implications of this decision. [6]
[Total 34]

END OF PAPER