INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

17 September 2018 (am)

Subject CA1 – Actuarial Risk Management

Paper One

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 seven 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 company offers unsecured short term loans to consumers who are in employment via the internet. The loans are for small amounts and are repayable as soon as the consumer receives their next salary from their employer. The repayment includes a defined cash fee agreed when the consumer is accepted for a loan.

Explain why the credit risk for these loans will be relatively high. [7]

2 (i) Describe market risk for both assets and liabilities. [3]

(ii) Describe, including examples, liquidity risk for an insurance company. [5]
[Total 8]

3 (i) List the non-economic factors that affect the demand for different asset classes. [6]

A country's economy is just starting to develop, and regulations are being put in place for the first time on the allowable asset classes that can be held by financial institutions.

(ii) Suggest, with reasons, why these regulations are likely to be prescriptive. [2]

(iii) Discuss how these regulations might affect market prices of allowable, and non-allowable, asset classes. [4]
[Total 12]

4 A life insurance company has, to date, written only whole life assurances and immediate annuities. It is about to start writing income protection insurance, to cover only long term sickness or incapacity due to accident or illness.

It intends to price the new income protection business using a multiple state model, and is in the process of setting initial best estimates (i.e. ignoring margins for prudence) of the required assumptions.

(i) List the main assumptions required for the multiple state model. [4]

(ii) Discuss data that could be used to set an initial best estimate for each assumption in part (i). [12]
[Total 16]

5 Two companies in the same industry have approached an actuary to advise them on the benefits packages they offer their respective employees.

- PXU has been established for over 25 years and has around 1,000 employees based in five locations around the country.

- Unicorn was set up six months ago and has ten employees, based in a single location in the same country.

(i) Outline how the issues to be considered, in designing the benefits packages, may differ between the two companies. [4]

The actuary proposes to both companies that they offer a flexible benefits system. Under this arrangement, employees are offered the option at the start of each year to revise the level of an existing benefit or to choose different benefits, which the employees "buys" either by reducing their pay or by giving up part of their existing benefits.

(ii) Describe how a flexible benefit approach can help meet the different needs of employees. [2]

As part of its new flexible benefits programme, PXU decides to partner with an insurance company, GGG, to offer life insurance cover to its employees.

(iii) Set out the main risks involved in this arrangement for:

(a) PXU.

(b) The employees of PXU.

(c) GGG.

[6]

Unicorn proposes to award its employees shares in the company at the end of each year, based on the individual employee's performance over the year.

(iv) Discuss the practical issues that Unicorn needs to consider in implementing this proposal. [5]
[Total 17]

6 (i) State the principal aims of regulation. [2]

(ii) Describe the areas of an insurance company's operation that may be regulated. [8]

(iii) Discuss the challenges that exist for the regulator in regulating insurance companies. [8]
[Total 18]

7 (i) Outline differences in the features of the following products, from the point of view of an individual arranging a mortgage in order to purchase a residential property:

- Interest only mortgage with an endowment assurance;
- Repayment mortgage;
- Interest only mortgage.

[6]

A large provider of financial services, ER, has decided to launch a product designed to allow individuals the opportunity to access capital tied up in their property.

The product features are:

- available to single homeowners aged over 60 who have no outstanding debt secured against their property;
- the homeowner sells the property to ER for a cash sum payable to the homeowner immediately;
- ER will then become responsible for all the issues associated with ownership;
- the homeowner will retain the right to continue to live in the property – in effect as a tenant but rent free – until they die. On death, ER will be free to do as it wishes with the property.

(ii) Explain why the cash sum offered by the insurer, to an individual selling their property under this product, is likely to be considerably less than the current market value of the property. [4]

(iii) Describe, for each of the above product features, the risks to ER that the product feature is trying to mitigate. [7]

ER is considering introducing a variation to the product. Instead of receiving a cash sum immediately, the homeowner can choose to receive an annuity payable until they die. The rate of increases to the annuity, and any death benefits payable to dependants, can be chosen by the homeowner from a range of options.

(iv) Discuss why anti-selection may be an additional risk to ER, that would arise from this product variation, and ways that ER could manage that additional risk. [5]

[Total 22]

END OF PAPER