STRATHMORE INSTITUTE OF MATHEMATICAL SCIENCES (SIMS)

BACHELOR OF BUSINESS SCIENCE: ACTUARIAL SCIENCE

END OF SEMESTER EXAMINATION

BSA 3220: ACTUARIAL PRACTICE AND COMMUNICATION EXAMINATION

DATE: Thursday, 5th December 2024 **TIME: 2 HOURS**

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested in 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. *Mark allocations are shown in brackets.*

4. *Attempt THREE questions, beginning your answer to each question on a new page.*

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

QUESTION ONE

a) Define the terms:

i. systematic risk
ii. specific risk

[2]

b) Describe the ideal criteria for risk events to be insurable. [3]

c) (i) Explain why a motor insurance company may want to investigate certain claims. [4]

(ii) Describe the main criterion that the insurance company would use to determine whether to investigate a particular claim. [3]

d) (i) Define information asymmetry. [2]

e)

(ii) Discuss the information asymmetry between the policyholder and theinsurance company, for an impaired life annuity policy [2]

(iii) Discuss how the information asymmetries in (ii) could be mitigated. [4]

QUESTION TWO

a) A general insurance company is looking to enter the public liability insurance market for the first time. It intends to specialize in offering insurance to music festivals, all of which have firework displays to end the festival. Describe how the actuarial cycle can be used in pricing this product. [9]

b) An insurance company wants to maximize return on capital allowing for risk.

(i) Describe the risk management tools that would be used. [8]

(ii) Explain the purpose of underwriting prior to acceptance of risk and how this helps the provider achieve the goal above. [3]

QUESTION THREE

A life insurance company is performing a supervisory valuation of its many lines of business.

Most material lines of business are valued using an industry-standard actuarial modelling system, called ELL, purchased from an external actuarial consultancy. Some material lines of business are, however, still valued using spreadsheets.

ELL is the company's strategic preferred system for all actuarial calculations across its operations. It is run and controlled by the company's central actuarial team andreceives data feeds directly from the company's administration systems.

Spreadsheets are controlled by the valuation team, separate from the central actuarial team, and rely on data supplied manually by the relevant administration teams.

a) Discuss the advantages and disadvantages of the company performing its supervisory valuation using ELL compared with the spreadsheets. [10]

One of the material lines of business which is still valued on a spreadsheet is required to be valued on ELL instead, in time for the next supervisory valuation. Relevant project conversion teams will be put in place to plan and implement this conversion. Implementation can occur only if the valuation team's actuary provides written approval that the revised system is fit for the purpose of the next supervisory valuation. The valuation team's actuary is not part of the project conversion teams.

b) Discuss the steps and investigations that the valuation team's actuary should perform before providing written approval of the revised system. [10]

QUESTION FOUR

a) List factors in the external environment which impact on providers of benefits. [5]

In a developing country, an increasing number of individuals are becoming homeowners. Due to the lack of maturity in the financial market the government has twoconcerns:

- That individuals may take out a mortgage which they cannot afford in the long term and risk losing their homes.

- That individuals are not taking out adequate property insurance due to a lack of insurance companies in the country.

To encourage individuals to address these concerns the government has set up a benefit trust. An individual is guaranteed to be able to join the benefit trust at the point they first purchase a property and will remain a member only as long as they continue to pay contributions.

Contributions payable on joining the benefit trust are to be a fixed (non-increasing) monthly amount payable from the point of house purchase until any mortgage has been fully paid off. The amount of monthly contribution is set by the Trustees on joining the benefit trust. A maximum contribution rate (expressed as a percentage ofthe value of the property) has been set by the government.

The benefit trust is intended to be non-profit making with the Trustees aiming to keepmonthly contributions at an affordable level. To make membership of the benefit trust attractive the government is proposing that the following benefits will be provided:

i. Mortgage payments will be paid for a maximum of 24 months on disability or if made redundant (qualification criteria to be defined bythe benefit trust).

ii. Property insurance and contents insurance.

iii. A lump sum equal to all contributions paid if the individual dies and has never made a claim under (i) or (ii).

b) Describe how the following factors in the external environment might impact the benefit of trust:

i. capital adequacy and solvency
ii. changing cultural and social trends
iii. risk management requirements
iv. state benefits

[8]

c) Discuss reasons why investment in large infrastructure projects may be appropriate for the benefit trust. [7]

QUESTION FIVE

a) Define "risk classification". [2]

The government has decided that the risks being run by the benefit trust are too high. Its main concern is that the benefit trust may need additional financial support if changes are not made. However, the government also has concerns over the public perception and popularity of the benefit trust.

b) Discuss how the government's concerns could be addressed by the following risk management proposals:

i. Removing the maximum contribution rate.
ii. Allowing the Trustees to change the contribution amount for existing members on an annual basis. [18]