

Actuarial Society of South Africa

EXAMINATION

4 May 2017

Subject A301 — Actuarial Risk Management

Paper Two

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Candidates will be issued with instructions to login using a password (which will be provided at the exam center).*
2. *Candidates are required to submit their answers in Word format only using the template provided. You MAY NOT use any other computer program (e.g. Excel) during the examination.*
3. *Save your work continuously throughout the exam, on your computer.*
4. *You have 15 minutes at the start of the examination 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.*
5. *You must not start typing your answers until instructed to do so by the invigilator/supervisor.*
6. *Mark allocations are shown in brackets on exam papers.*
7. *Attempt all questions, beginning your answer to each question on a new page.*
8. *Candidates should show calculations where this is appropriate.*

Note: The Actuarial Society of South Africa will not be held responsible for loss of data where candidates have not followed instructions as set out above.

AT THE END OF THE EXAMINATION

Save your answers to the hard drive.

Hand in your question paper with any additional sheets firmly attached.

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

List and briefly describe reasons a life insurer may be concerned about withdrawal (lapse) rates.

[Total 5]

QUESTION 2

The required return for equities is typically summarised as *Required return = required risk-free real yield + expected inflation + equity risk premium*.

- i. Discuss why an investor should require a return that allows for “*expected inflation*”.
[1]
- ii. List the risks that the investor needs to be compensated for in the “*equity risk premium*”. For each listed risk, discuss how this risk might reasonably materialise.
[4]
- iii. For each risk listed in (ii), provide at least two actions that investors can take to mitigate the risk.
[3]

[Total 8]

QUESTION 3

A good project management team will keep clear documentation and audits of changes. A key document is called the *written strategy*. List the factors that are typically considered in the *written strategy*.

[Total 7]

QUESTION 4

Describe four possible sources of operational risk for an organisation. Using a University as an example of an organisation, show how each source might lead to a risk by providing two examples per source of risk (eight in total).

[Total 6]

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QUESTION 5

- i. Explain what is meant by a self-regulatory system; why this occurs in practice; as well as the main advantages and disadvantages of this type of system. [6]
 - ii. Regulation in the financial industry aims to, among other things, protect consumers of financial products and promote efficient and orderly markets. Discuss the cost of regulation and the implications for consumers. [6]
- [Total 12]

QUESTION 6

You are the pricing actuary for the group risk division of an insurance company. You have been asked by an intermediary to insure a professional rugby team for life and disability insurance.

- i. State the main risks you would be insuring. For each risk, state with reasons, whether the risk would be higher or lower than the general population. [4]
 - ii. State what factors you could take into account for pricing the disability risk and why they might be important. [3]
 - iii. Your boss is not sure she wants to insure professional sports people for disability because she believes it could be too risky. Suggest, with reasons, ways to mitigate the risk. [4]
- [Total 11]

QUESTION 7

- i. List the reasons why an insurance company might need capital. [3]
 - ii. List the possible sources of capital for an insurance company. [3]
 - iii. List the benefits of holding significant amounts of free capital? [3]
- [Total 9]

QUESTION 8

You are working in the asset management department of a large life insurance company. You are considering allocating a portion of the investment portfolio to a corporate bond that is expected to issue within the next month.

- i. Describe the investment and risk characteristics of corporate bonds. [10]

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The issuer of the corporate bond has provided more information on the potential transaction. The issuer is the national road agency, which is mandated by the national government to finance, improve, manage and maintain the national road network of the country.

The funds raised from the issue of the bond will be used to expand the e-Toll project in Gauteng and other major cities. Therefore, the funds will be used to invest in infrastructure projects, and in return the users of the infrastructure will pay toll fees to the agency.

It is envisaged that the national government will not be backing this bond if a default should occur.

- ii. By applying the canons of lending, discuss the factors that should be considered before a final decision is made to invest in this bond. [6]
- iii. List other factors that should be considered before a final decision is made to include this bond as part of your investment portfolio. [4]

[Total 20]

QUESTION 9

U-Sure is a young insurance company selling personal lines vehicle and property insurance products. Currently, their clients have to pay an excess of the first 7.5% or R3 500 (whichever is greater) in the event of a motor insurance claim.

As the pricing actuary, you have been instructed to investigate the impact of changing the excess to the first 5% or R3 000 (whichever is greater). The company has not yet determined whether this will result in a premium change for policyholders.

- i. Describe reasons why an insurance company may require an excess in the event of a claim. [2]
- ii. Explain why U-Sure may be considering changing the excess. [3]

It has been suggested that you use a stochastic model to quantify the impact of the change.

- iii. Discuss how you would construct such a model. You may assume that you have full access to the results from the recently completed pricing exercise. [12]
- iv. Describe what sort of statistics and figures you would include in your final report to management. [5]

[Total 22]

[GRAND TOTAL 100]

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END OF EXAMINATION