ACTUARIAL SOCIETY OF SOUTH AFRICA

EXAMINATION

23 May 2023 (am)

Subject F107/B100 — Banking Fellowship Principles

Time allowed: *Three hours and twenty minutes (which includes five minutes for downloading and uploading your answer document)*

Total marks: *100*

INSTRUCTIONS TO THE CANDIDATE

1. *Ensure that you are logged in and authenticated through Examity before you attempt the examination.*
2. *The question paper is only available in the ASSA Exam Platform as a PDF download and may not be printed. Copy/paste of questions or parts thereof is allowed from the question paper to your Word answer document only.*
3. *Download the Word answer document template from the ASSA Exam Platform. Save this Word answer document on your desktop using your Candidate Number as filename. You are required to submit your answers in Word format ONLY using this document. No answers in any other format (e.g. handwritten) will be accepted. Save work regularly.*
4. *Ensure that your Candidate Number appears in the "header" of your Word answer document. [Double-click on the header at the top of the Word document, input your Candidate Number only in the header, then press "Esc" to close the header.]* ***Do not use your name or member number anywhere in your Word answer document.***
5. *You may not access any file from your computer, use any other computer program (e.g., Email or Excel), or open any other browser during the examination.*
6. *You may not use any other material (e.g., a Formulae and Tables book) during the examination. Any such information that may be required will be provided to you within the examination.*
7. *You are strongly encouraged to use the first 15 minutes as reading time only, however, you may start answering the paper whenever you are ready.*
8. *Mark allocations are shown in brackets.*
9. *Attempt all six (6) questions, starting each on a new page (as provided for in the Word answer document).*
10. *Show calculations where appropriate. You may use blank paper to carry out rough work calculations. You may use a calculator from the approved list only.*
11. *Upload your Word answer document only into the ASSA Exam Platform. Once you have uploaded your document, you must click on* ***Finish Attempt*** *to save your document. You will still be allowed to go back and make changes (****Review Attempt****) if you have time.*
12. *Once you are satisfied with your uploaded document, click* ***Finish Attempt*** *and* ***Finish all and Submit****. Once you have submitted you will not be able to make any changes.*
13. ***You must submit your Word answer document BEFORE the end of the allotted examination time.*** *You should stop writing and start uploading during the last five minutes. Take this into account when planning your review and submission. There will be no time announcements.*

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.

END OF INSTRUCTIONS

QUESTION 1

Bank XYZ is a large bank operating in the country of Actuaria. It offers a range of retail products including: home loans, vehicle finance, transactional accounts, credit cards, insurance products and investment products.

The country of Actuaria has faced increasing climate-related risks and perils over the past decade, with a particular region of this country being predicted to experience a significant increase in the frequency and severity of floods over the next five years.

i. Describe any potential impacts of this on the main risks associated with the bank's products and operations. Focus on credit, operational and insurance risk impacts.

[7]

Over the course of the year, as had been predicted, the country experienced a higher number of floods. The CRO has been asked to update the Board of Directors on the impact to the bank and changes to the risk profile and strategy. During the update she stated the following:

"During the year, our portfolio has been relatively sheltered from the effects of the increasing flood risk in the country. In particular, our home loan portfolio did not experience a significant credit loss impact after the floods, with key portfolio indicators remaining stable."

ii. Suggest the possible reasons for the CRO's statement.

[6]

The CRO has heard that a neighbouring country is experiencing higher frequency of wildfires. She has noted that this could have an impact on the bank as there are geographic similarities in the areas of the country that are near the neighbouring border. She wants to build a forecasting model to assess future impacts of wildfires on the credit portfolio.

iii. Describe the data that would be required to conduct the analysis.

[5]

[Total 18]

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QUESTION 2

i. Define the term counterparty credit risk (CCR) and outline when it may occur.

[2]

ii. Outline the two Exposure at Default (EAD) measurement approaches for counterparty credit risk: Standardised Approach (SA-CCR) and the Internal Model Method Approach (IMM-CCR).

[6]

Denote f(t) as the exposure of a derivative contract at time t years from now. Let M be the notional amount and σ be the volatility of the underlying contract. The current time is t=0, and maturity is at time t=T.

The following information is given:

Expected Exposure (EE)(t) = $\mathbf{E}[f(\mathrm{t})] = M\beta\sigma\left(t^{1/4}\right)$

Effective Expected Exposure (EEE)(t)= Expected Exposure (EE)(t)

M = L$100m, β = 5, σ = 0.05, T = 1

iii. Calculate the EAD under the IMM approach.

[4]

Hint:

$$Effective\ Expected\ Positive\ Exposure\ (EEPE) = \int_0^1 EEE(x)\,dx$$

$$\int_0^t x^n\,dx = \left[\frac{x^{(n+1)}}{(n+1)}\right]_0^t$$

[Total 12]

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QUESTION 3

i. Outline the main products that retail banks offer to individuals.

[4]

You work for Bank XYZ and the chief marketing officer has approached you to help investigate the feasibility of implementing a retail rewards programme. At this stage the bank is considering either reducing customer bank fees, providing an upfront "cashback" or allocating mobile minutes and data.

ii. For each of the three options, discuss the considerations you would highlight to the chief marketing officer when deciding on which form the rewards should take. Also highlight any overall considerations to take into account when deciding on a rewards structure.

[8]

The bank has decided to go ahead with the rewards programme and will provide cashbacks to customers. To drive credit card take-up and spend, the cashback will be determined as a percentage of monthly spend on a customer's credit card.

iii. Discuss the risks arising from this strategy with regard to: implementation, financial, regulatory, marketing and product risk. For each risk, also provide mitigating actions that can be taken.

[8]

[Total 20]

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QUESTION 4

A customer is looking to purchase a new vehicle for L$ 15 000, with a loan from ABC Bank. The customer has been offered three loan products to facilitate this transaction. Details of the three offerings are shown in the table below.

Product	**A**	**B**	**C**
Type	Unsecured personal loan	Secured vehicle finance	Credit card
Term	72 months	48 months	12 months - revolving
Security	Credit life insurance	Vehicle	None
Interest rate	Fixed	Linked	Linked
Deposit required	None	10% of vehicle price	None
Credit limit	N/A	N/A	L$ 20 000

i. The credit analyst shows you the three offerings that will be presented to the customer. Discuss the relative merits of the different products offered from the perspective of:

a. the customer,

[5]

b. the bank.

[6]

Your team member is busy developing credit risk models and is investigating industry data. He suggests to the Head of Credit that the bank should rather target the used vehicle segment. This is due to the observation that used vehicles depreciate at a much slower rate than new vehicles.

ii. Evaluate your team member's suggestion to the Head of Credit.

[5]

[Total 16]

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QUESTION 5

You are a credit analyst at SNB Bank. The bank has been approached by the consortium who are planning on building stadiums and require finance.

i. Briefly describe project finance and outline the use of a Special Purpose Vehicle (SPV) in this arrangement.

[3]

ii. Outline any six types of credit guarantees.

[3]

A colleague in your team has been reading up on guarantees and how any sovereign guarantees may affect the credit risk assessment on the project finance loan. He has asked you for your advice in considering guarantees as part of the overall credit risk assessment he is busy preparing.

iii. Discuss how a sovereign guarantee could impact the credit risk assessment on the project finance loan.

[4]

A ‘cash sweep’ can be defined as: a company using excess cash to pay outstanding debts ahead of the scheduled payment date instead of distributing it to investors, shareholders or other stakeholders.

iv. Explain the advantages to the bank if it enforces a cash sweep clause.

[4]

[Total 14]

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QUESTION 6

i. Briefly define model risk and outline ways of managing model risk.

[4]

Bank ABC offers a wide variety of lending and savings products. The chief marketing officer has approached you to help replace the current marketing approach with a personalised solution that will recommend one specific product to customers through their mobile application.

ii. List the specific factors of each client that you would require to build a recommendation model for the current product offering.

[4]

You have decided on a simple model that groups customers into homogenous groups based on demographic data and banking behaviour that then determines their most likely product take-up.

iii. Outline the risks of implementing this model, including the model and operational risks associated with a personalised approach like this.

[6]

The model has been implemented for three months and take-up of certain products have increased. However, credit card take-ups have remained flat, even though it is one of the most recommended products. You have been tasked with investigating why this is the case.

iv. Outline which factors you would investigate to assist with your investigation.

[6]

[Total 20]

[Grand Total 100]

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END OF PAPER

