



ACTUARIAL SOCIETY OF SOUTH AFRICA

EXAMINATION

30 October 2024

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

Failure to adhere to any of these instructions could incur examination sanctions.

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. Do not name your answer script with your name or member number.
4. 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.
5. 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.
6. You may not access any file from your computer, use any other computer app (e.g., Email or Excel) or open any other browser during the examination. Nor may you use Grammarly, Grammarly Premium or similar add-ins. Microsoft Word spellcheck is allowed.
7. 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.
8. 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.
9. Mark allocations are shown in brackets.
10. Attempt all six (6) questions, starting each on a new page (as provided for in the Word answer document).
11. Show all calculations. You may use blank paper to carry out rough work calculations. You may use a calculator from the ASSA-approved list only.
12. 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.
13. 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.
14. **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.

The onus remains on you to read and implement all examination instructions.

END OF INSTRUCTIONS

QUESTION 1

Five years ago, Jane Doe took out a mortgage loan from BankXYZ. The important details are shown below:

- Initial loan amount: L\$200,000
- Interest rate: 4% per annum compounded monthly at the start
- Term of loan: 30 years
- Jane's yearly income: L\$60,000

The mortgage was priced assuming lifetime fixed rate of 4% compounded monthly. After 5 years, however, the interest rate increased to 5% per annum compounded monthly. Jane's salary has been increasing by 3% every year.

- i. Calculate Jane's Debt-to-Income (DTI) ratio when she first received the loan and after the interest rate changes to 5%. Taxes and other expenses can be ignored.

[3]

Hint:

$$L_t = X * \left[\frac{1 - \left(1 + i^{(p)}/p\right)^{-(n-t)}}{i^{(p)}/p} \right]$$

L_t the loan amount outstanding at time t

X monthly repayment amount

n original term of the loan

$i^{(p)}$ interest rate compounded at period p per annum

p compounding period

BankXYZ currently holds a L\$2 billion mortgage portfolio, with a 40% allocation in fixed-rate mortgages (FRM) and 60% in variable-rate mortgages (VRM). The average interest rate for new mortgage originations stands at 4% per annum. Given the bank's expectation of a steady 2% increase on the interest rate for mortgages over the next year due to anticipated inflationary pressures, you are tasked with analysing the financial risks associated with the bank's existing mortgage portfolio under the forecasted economic scenarios.

- ii. Describe the major financial risks BankXYZ faces with its current portfolio composition in light of the expected increase in interest rates. Consideration should be given to the impact of this interest rate change on the bank's funding costs and its profitability margins, and other factors such as credit risk.

[5]

- iii. An actuarial student has suggested BankXYZ should cease to issue variable rate mortgages. Provide an outline to the student on what impact this would have on the bank's financial position as well as its competitive position in market.

[6]

[Total 14]

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QUESTION 2

You work at Bank One, which is a retail bank looking to expand into corporate banking. You are tasked with developing a risk management strategy for its potential corporate loan portfolio.

- i. Discuss how the combination of simulation, expert judgment, and internal and external data can be utilised to build models for estimating default probabilities and losses.

[4]

Bank One is considering using external credit ratings, provided by agencies like Moody's and Standard & Poor's, in assessing default experience for the corporate loan book.

- ii. Analyse the advantages and limitations of this approach and provide strategies for overcoming the limitations.

[5]

- iii. Compare the challenges that a bank might encounter when calibrating models for a new corporate loan portfolio versus an existing retail loan portfolio with regards to data availability and model complexity.

[6]

[Total 15]

QUESTION 3

- i. Describe the roles of supra-national and national regulatory bodies in the oversight of banks and give an example of each.

[3]

- ii. Describe the “Twin Peaks” model of financial regulation and elaborate on what the main objectives of each of the regulatory peaks are.

[3]

You are the Chief Compliance Officer (CCO) at a newly established digital bank that aims to operate in the European Union and South Africa, regions governed by strict data protection regulations, namely the General Data Protection Regulation (GDPR) and the Protection of Personal Information Act (POPIA), respectively.

Your bank is pioneering a unique financial product that leverages customer data to offer personalised banking and investment solutions. As the CCO, you are tasked with ensuring that the bank's operations are fully compliant with these regulations from the outset, while also capitalising on the data-centric nature of your new product.

- iii. Discuss the main operational challenges the bank will face in ensuring it complies with these data protection regulations when conducting business, and ways in which these challenges could be addressed.

[8]

[Total 14]

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QUESTION 4

Basel IV is a term used by bankers and regulators to refer to the final Basel III reforms, published in December 2017. Under Basel IV, revisions have been made to both the standardised approach and the internal ratings based (IRB) approach for credit risk.

- i. Outline the purpose of the revisions made to credit risk measurement approaches under Basel IV.

[3]

Balfour Bank, which is a multi-national wholesale bank, currently applies the advanced internal ratings based (AIRB) approach across all its credit portfolios. The regulator within Balfour Bank's primary market has asked banks to perform an assessment of the expected impact of Basel IV on credit risk weighted assets, in preparation for final implementation of the revisions.

- ii. Outline practical factors that Balfour Bank should consider in determining how to approach the regulator's request. Include consideration of the scope of the request and roles and responsibilities related to fulfilling the request in your response.

[6]

- iii. Referencing the revisions made to credit risk measurement approaches, discuss the operational implications for the bank in implementing the revisions and practical steps that could be taken to enable a smooth transition.

[8]

[Total 17]

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QUESTION 5

Orion Bank is a large, full-service retail bank operating within a single jurisdiction. The following information has been extracted from Orion Bank's financial statements for 2020, 2021 and 2022:

Balance Sheet (L\$ million)			
	31-Dec-2020	31-Dec-2021	31-Dec-2022
Assets			
Cash and cash equivalents	31,280	29,900	33,120
Investment securities	68,310	85,100	87,860
Loans and advances	289,800	282,900	307,050
Property and equipment	4,830	4,600	4,600
Other assets	47,380	27,600	28,750
Total assets	441,600	430,100	461,380
Liabilities			
Deposits	353,050	354,200	380,880
Other liabilities	55,200	36,800	39,100
Total liabilities	408,250	391,000	419,980
Total Equity	33,350	39,100	41,400
Total equity and liabilities	441,600	430,100	461,380
Income Statement (L\$ million)			
	31-Dec-2020	31-Dec-2021	31-Dec-2022
Interest income	27,830	23,920	24,840
Interest expense	(13,570)	(9,660)	(9,660)
Impairment charge	(5,474)	(3,082)	(1,380)
Non-interest revenue	9,430	10,350	11,040
Total operating income	18,216	21,528	24,840
Costs	(12,650)	(12,880)	(14,030)
Net income before tax	5,566	8,648	10,810

- i. For each of the following factors, specify a financial ratio or measure that can be used to assess the bank's performance, explain why this ratio or measure is relevant, and calculate this ratio or measure using the information above for 2020, 2021 and 2022, stating any assumptions made.
- Stability of funding
 - Profitability
 - Efficiency

[8]

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The following table shows macro-economic measures for the jurisdiction within which Orion Bank operates, for the years under consideration:

	31-Dec-2020	31-Dec-2021	31-Dec-2022
Year-on-year GDP growth	-6.3%	4.9%	2.0%
Annualised inflation	3.2%	4.6%	7.0%
Interest rate (reference rate)	3.5%	3.75%	7.0%
Year-on-year employment growth	-1.2%	4.4%	1.0%

- ii. Explain how changes in the macroeconomic environment over the period under consideration could have impacted Orion Bank's performance in general and in relation to stability of funding and efficiency. Reference the financial statement information provided, and the relevant measures calculated, in your response.

[12]

[Total 20]

QUESTION 6

You are an actuarial student working in Coco Bank in the country of Actuarial. Coco Bank offers retail and corporate banking products, including secured lending, unsecured lending, transactional accounts and insurance products.

The government of Actuarial is looking at the emission policies of the different sectors in order to set out targets to reduce emissions.

Transition Risk can be defined as: the risk of losses or costs associated with the process of transitioning to a lower emission economy.

- i. Outline four sub risks under Transition Risk, giving examples of each sub risk.

[4]

The Chief Credit Officer has approached you to understand more about transition risk and the impact on the credit portfolios. He has asked you to develop a transition risk scorecard to assess the transition risk of larger counterparties in the corporate credit portfolio.

- ii. Discuss the practical challenges that you may face in developing a transition risk scorecard.

[4]

- iii. Outline the various data requirements that may be required in developing such a scorecard.

[4]

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The government of Actuarial plans on going green by introducing Electric Vehicles (EVs) in the economy. The government plans on banning the sale of fuel vehicles (non-electric) in 5 years' time. Non-electric vehicles may be phased out of the country in the next 12 years.

- iv. Discuss the potential impact on Coco Bank's credit portfolios.

[5]

The sales team has suggested the retail LGD (loss given default) models be adjusted such that the LGDs are reduced for non-electric vehicles. The suggestion is made as it could boost sales in the next 5 years, and noting that these vehicles will have less of an impact once the ban has taken place.

- v. Discuss the suggestion made by the sales team.

[3]

[Total 20]

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END OF EXAMINATION