

EXAMINATION

27 October 2022 (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. You will be provided with a Word template within the ASSA Exam Platform to download and use to complete your questions. Submit your answers in Word format **ONLY** using the answer template provided. No uploads of answers (handwritten or otherwise) will be accepted.
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.
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 are strongly encouraged to stop writing and start uploading during the last five minutes (when the ASSA Exam Platform countdown clock turns red). 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

- i. State the definition of interest rate risk in the banking book. [2]
- ii. There are multiple sources of interest rate risk in a bank. Briefly outline gap risk, basis risk and yield curve risk. [3]

A simple bank balance sheet (in Local Dollar currency) is shown in the table below:

Assets	L\$ millions	Liabilities and Equity	L\$ millions
Personal Loans - Variable Rate (12% p.a.)	150	Demand deposits – (3% p.a.)	100
20-year Mortgages – Fixed Rate (7% p.a.)	50	Fixed Rate Deposits – 5 year (6% p.a.)	50
		Equity	50
Total Assets	200	Total Liabilities and Equity	200

- iii. Using the information in the table above and a static balance sheet assumption, calculate the following:
- a. The expected net interest income (NII) over the next year.
- b. The one-year repricing gap.
- c. The expected change in NII (Δ NII) given a 3% increase in interest rates. [2]
- iv. State reasons as to why the actual change in NII may be different from the NII estimate in (iii) (c) above. [4]

[Total 11]

REMEMBER TO SAVE

PLEASE TURN OVER

QUESTION 2

You are an actuary working at ABC Bank that offers retail vehicle finance products, in the country of Actuaria.

Actuaria's central bank is considering increasing the short-term interest rates.

- i. Discuss the impact the changes may have on:
 - a. ABC Bank
 - b. The general economy

[7]

Actuaria is expecting a 50% increase in the fuel prices for all types of fuel in the next month.

- ii. Discuss the impact of such a change on ABC Bank's vehicle finance portfolio.

[5]

The CEO suggests that ABC Bank starts offering home loan products. You have been tasked to manage the project of developing a pricing scorecard model.

- iii. Briefly describe some of the potential roles and responsibilities of the following stakeholders in such a model build:
 - a. Model development team
 - b. Credit bureaus
 - c. Model risk committee
 - d. Internal audit

[4]

[Total 16]

REMEMBER TO SAVE

PLEASE TURN OVER

QUESTION 3

- i. Briefly define Development Banks and Shadow Banks. [4]
- ii. Compare some of the major differences between Development Banks and traditional Retail or Commercial Banks. [6]
- iii. A government has published new regulations for one of its Development Banks. One of the regulations included a maximum debt-to-equity ratio of 300%. State possible reasons as to why this regulation was included. [2]

[Total 12]

REMEMBER TO SAVE

PLEASE TURN OVER

QUESTION 4

A large bank, OpBank just appointed a new CRO and his first area of focus is to review the Operational Risk frameworks.

- i. The CRO has asked you to provide a brief overview of operational risk and approaches to managing operational risk under the current Basel II guidelines.

[5]

- ii. Briefly describe the measurement approaches for operational risk capital under Basel II.

[3]

The CRO has recently read about the upcoming capital reforms under Basel III. In particular, that the capital measurement approach for Operational Risk is moving toward a more standardised calculation. He has requested a report discussing the main considerations of moving from the advanced approach under Basel II to a more standardised approach under Basel III.

- iii. Discuss the points you would make in your report.

[12]

[Total 20]

REMEMBER TO SAVE

PLEASE TURN OVER

QUESTION 5

You are the Head of Credit at NuBank. NuBank is a start-up bank offering mainly retail lending products. Your portfolio includes Credit Cards, Overdrafts, Home Loans and Personal Loans. As part of ongoing credit risk monitoring, your team is required to review the provisioning results obtained from the credit risk modelling and reporting team that calculates the provisioning requirements monthly.

- i. Outline the types of credit provisions that exist.

[3]

- ii. Explain why a bank should raise credit provisions and why it is important to determine the value of credit provisions accurately.

[3]

Over the last quarter you have noticed that the provisions held for the Retail Credit Card portfolio have increased significantly, as noted in the tables below.

2022 Quarter 1 Account Information (in local dollar L\$ millions)			
Product	Provisions	Outstanding Balances	Total Credit Limits
Credit Card	510	8,500	28,333
Personal Loans	700	7,000	
Home Loans	4,500	150,000	
Overdrafts	315	4,500	12,857

2022 Quarter 2 Account Information (in local dollar L\$ millions)			
Product	Provisions	Outstanding Balances	Total Credit Limits
Credit Card	700	10,235	30,104
Personal Loans	688	6,800	
Home Loans	5,400	175,000	
Overdrafts	360	5,000	13,821

- iii. Explain how you would evaluate and compare these results. Include details on how you would establish possible causes for the results in your answer.

[10]

The CRO of the Credit Card product suggests that the risk needs to be drastically reduced as a result of these increases in provisions on the Credit Card product. He suggests cutting new facilities 25% by increasing the risk cut-off on the application scorecards and by reducing maximum facilities offered across all risk buckets.

- iv. Discuss the CRO's suggestion.

[4]

[Total 20]

REMEMBER TO SAVE

PLEASE TURN OVER

QUESTION 6

You are a credit analyst in the SME lending (business bank) function of a bank. Your team is busy with updates of credit risk models which are applied to business customers.

- i. Briefly outline the definition and the different uses of the credit risk parameter: Probability of Default (PD). [3]

- ii. Outline some of the quantitative and qualitative aspects an analyst should look at when assessing the default risk of a business customer. [4]

The bank has decided to use both quantitative and qualitative factors in developing its scorecard for estimating PDs on SME lending.

- iii. Briefly discuss the considerations of using qualitative factors in developing a scorecard to estimate PDs. [3]

The PD calibration took into account expert ratings to parameterise the model. The model chosen, and calibration dataset, is shown below.

The PD model took the form of the following:

$$PD_i = \frac{1}{e^{a \times final\ score_i + b}}$$

where:

PD_i is the estimated PD output for customer i ;

a, b are calibrated constants;

$final\ score_i$ is the score for the customer, using the following components:

$$final\ score_i = w \times (QuantS_i) + (1 - w) \times (QualS_i)$$

w is the weight factor $\in [0,1]$ and is fixed for all customers;

$QuantS_i$ is the score output from the quantitative scorecard for customer i , $QuantS_i \in [0,100]$;

$QualS_i$ is the score output from the qualitative scorecard for customer i , $QualS_i \in [0,100]$.

REMEMBER TO SAVE

PLEASE TURN OVER

Parameters a: 0.09 b: 0.22 w: ??				Estimated PD, based on model parameters	Actual PD, concluded by business experts		
Customer	Quantitative Score	Qualitative Score	Final Score	Model PD (PD_i)	Actual PD (expert rating)	Model PD Rank	Actual PD Rank
A	66	74	??	0.147%	0.02%	4.0	1.0
B	89	66	??	0.075%	0.04%	1.0	2.0
C	87	66	??	0.082%	0.05%	2.0	3.0
D	78	64	??	0.135%	0.10%	3.0	4.0
E	61	66	??	0.265%	0.10%	6.0	4.0
F	36	44	??	2.193%	0.17%	9.0	6.0
G	76	50	??	0.277%	0.30%	7.0	8.0
H	70	53	??	0.317%	0.17%	8.0	6.0
I	77	62	??	0.154%	0.30%	5.0	8.0
J	29	51	??	2.193%	4.00%	9.0	10.0

- iv. Your colleague has some of the model output but cannot remember the final scores and the weight applied. Given the above information, calculate the final weight (w) applied in the score calculation.

[4]

- v. Discuss the overall PD model fit on the calibration dataset.

[5]

- vi. State reasons as to why this PD model would have used expert ratings in the model calibration.

[2]

[Total 21]

[Grand Total 100]

REMEMBER TO SAVE

END OF PAPER