EXAMINATION

30 October 2020 (am)

Subject F105 — Finance and Investment Fellowship Principles

Time allowed: Three hours and fifteen minutes

Total marks: 100

INSTRUCTIONS TO THE CANDIDATE

1. *Ensure that you are logged into your ProctorU account before attempting the examination.*

2. *Questions are only available in this ASSA Examination platform and may not be printed.*

3. *You are required to submit all of your answers in the ASSA Examination platform only. No uploads of answers (handwritten or otherwise) to the ASSA Examination platform will be accepted.*

4. *You may not use any other computer program (e.g. Email, MS Word or Excel), files or open any other browsers during the examination.*

5. *You are strongly encouraged to use the first 15 minutes as reading time only, however, you may commence answering the paper whenever you are ready.*

6. *Mark allocations are shown in brackets.*

7. *Attempt all seven (7) questions.*

8. *Show calculations where this is appropriate. You may use blank paper to carry out rough work calculations. You may use a calculator from the approved list only.*

9. *You may return to your answers to review and amend during the allotted examination time. Once you are happy with your answers you need to* ***Finish all and Submit*** *your work. Once you have submitted you will not be able to make any more changes to your answers.*

10. *It is the candidate's responsibility to ensure that all work is submitted BEFORE the end of the allotted examination time. Take this into account when planning your review and submission. There will be no time announcements.*

Note: Answers will be saved automatically during the examination. However, 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. List four characteristics that distinguish infrastructure assets from more traditional equity or debt investments.

[2]

ii. Give three examples of economic infrastructure assets and three examples of social infrastructure assets.

[3]

The government of a developing country has awarded a contract for the construction of a hydro-electric power station to iBuild, a private local construction and engineering company. iBuild is required to finance the development, and is then entitled to keep a specified proportion of income generated by the power station from electricity sales for the first 20 years of operation, after which all rights to the power station revert to the government.

iii. Outline measures the government can take to improve the attractiveness of infrastructure investments for investors.

[3]

iv. State the type(s) of capital that is suitable for iBuild to raise for the planning, and for the construction phases of the project.

[1]

The project is completed successfully and after one year of operation, iBuild sells the power station to BigOps, an offshore listed company that buys and operates completed infrastructure.

v. Outline the risks relating to this investment faced by BigOps.

[6]

BigOps wants to insure the power station against earthquake risk and chooses to do this through the capital markets by issuing a catastrophe bond. The company approaches a global reinsurer to arrange the bond.

vi. Describe the process, including key decisions required, for creating and issuing the bond in the capital markets.

[5]

[Total 20]

PLEASE TURN OVER

QUESTION 2

A particular country is successfully executing an export-led growth strategy. Exports have exceeded imports for a sustained period and in the process the country has built up large foreign reserves. The reserves are managed by the central bank.

i. List six possible mandates of a central bank.

[3]

ii. Explain the short-term effect that lowering local interest rates might have on the value of the local currency.

[2]

iii. Explain how the central bank can intervene directly in the currency market to keep the currency exchange rate at a depressed level for a sustained period.

[2]

iv. Discuss how the government's labour policy can further promote the economy's international trade competitiveness.

[2]

[Total 9]

QUESTION 3

i. Explain what is meant by "corporate governance", including the role of non-executive directors in corporate governance.

[4]

Active equity fund managers in a developing country have been increasingly focused on ethical, environmental and governance (EEG) issues in their investment decision-making process.

ii. Give four examples of ethical considerations and four examples of environmental considerations relating to potential investments that may lead to fund managers excluding these investments from their funds.

[4]

The developing country's stock exchange has been requested to develop an ethical, environmental and governance benchmark index (ETHI) that reflects these issues.

The stock exchange proposes an index based on its current market-capitalisation weighted share index (MCWI) of companies listed on the local stock exchange. Companies listed on the local stock exchange are allocated to a specific industry, based on the primary activity of the company. An industry's weight in the MCWI is based on the total market capitalisation of companies in that industry relative to the total market capitalisation of all listed companies.

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The new index (ETHI) will be constructed on the following basis:

- all listed companies included in the MCWI will be given an EEG score (a high score corresponding to a desirable company) which is reviewed annually;
- All companies within an industry are sorted in order from highest to lowest EEG score;
- For each industry, companies are added to the ETHI starting with the highest EEG scoring company, until the market capitalisation of companies in the new index reaches 50% of the MCWI market capitalisation for that industry – the last inclusion is likely to have its market capitalisation capped.

The ETHI will thus be a market-capitalisation weighted index based on a subset of MCWI constituents and industry weights being the same as in the MCWI.

iii. Discuss the likely challenges to be faced in the construction (by the exchange) and acceptance (by investors) of the ETHI.

[7]

You are given the following information for the MCWI:

Date	MCWI capital index value	MCWI XD adjustment
1 July 2019	3 460	23
31 December 2019	3 399	54
30 June 2020	3 575	27

iv. Calculate the Sharpe measure for the MCWI over the period 1 July 2019 to 30 June 2020 if the risk-free rate and the annual standard deviation of the MCWI return over the period were 3% and 20% respectively.

[3]

The stock exchange is considering calculating and publishing a risk-adjusted MCWI return index based on the Sharpe measure.

v. Comment on the usefulness of such a risk-adjusted index to investors.

[2]

[Total 20]

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QUESTION 4

A listed hotel company experiencing poor trading conditions during 2020 expects a minor improvement in conditions during 2021 and 2022. The company has just (as at 30 September 2020) updated their projected 2020 and budget 2021 accounts.

	Notes	2019 *R million* *Actual*	2020 *R million* *Projected*	2021 *R million* *Budget*
Income Statement				
Operating Profit		35	(5)	16
Interest on Private Debt		(10)	(8)	(8)
Building impairment	1	0	(45)	0
Net Retained Profit/(Loss)	2	25	(58)	8
Balance Sheet (31 December)				
Shareholder funds plus Retained Earnings		60	2	10
Private Debt @ 10%	3	80	80	80
Total Debt and Equity		140	82	90
Buildings		130	85	85
Net Current Assets		10	(3)	5
Total Assets		140	82	90

Notes:

1) During 2020, the company impaired property values by R45m as a consequence of the negative short to medium-term outlook.
2) No tax is payable in 2020 and 2021.
3) The private debt is amortising. The original loan of R100m was due to be repaid in 5 equal annual capital instalments on 31 December 2019 to 31 December 2023. The first payment was made on 31 December 2019.

i. With reference to the FTSE industry classification system used for equities, state the industry the hotel company belongs to, and describe the industry's main features.

[3]

You work as an analyst for the private debt funder.

ii. Assess the company's financial strength and its ability to repay its debt, based on the above accounts.

[6]

After reviewing the above accounts, the board considers measures to improve the company's financial strength.

iii. Suggest two potential sources of share capital and comment on the effectiveness of these sources to ensure the continued operation of the business.

[3]

[Total 12]

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QUESTION 5

A South African bank decides to hedge its position in a forward interest rate swap under which it will receive a fixed interest rate on a notional R1bn, starting in 2 years' time, with a further term of 3 years.

i. Explain why a short position in a forward bond might be considered an appropriate hedge for the bank's forward swap exposure.

[2]

The bank identifies a 5-year SA government bond with annual coupon rate 10% and price R108 per R100 nominal. The bond just paid a coupon. The 1-year and 2-year effective risk-free spot rates are 6% p.a. and 7% p.a. respectively.

ii. Calculate the current forward price of the above bond in two years' time, per R100 nominal.

[2]

The bank obtains the following volatility and correlation data:

- Standard deviation of price changes on the forward swap (fixed rate leg) = 5%
- Standard deviation of price changes on the forward bond = 6%
- Correlation coefficient between price changes on the above instruments = 0.9

iii. Calculate the nominal amount of the forward bond that would optimally hedge the bank's swap exposure.

[2]

iv. State why this hedge is not a perfect hedge.

[2]

v. The forward bond is arranged over the counter (OTC). Discuss the cashflows expected under the forward with and without a clearing house being used.

[2]

[Total 10]

QUESTION 6

A life insurance company calculates the value of their level, without-profit annuity liabilities using zero-coupon nominal government bond yields of appropriate duration. The assets for these liabilities are invested in a multi-asset portfolio which includes equities, bonds and cash, and any investment profits or losses are for the shareholder account.

The directors of the company are concerned about investment losses resulting from a change in the level and shape of the yield curve.

One of the directors proposes the immediate implementation of a liability hedging strategy to the whole portfolio, using only bonds, swaps and cash.

i. Comment on the director's proposal.

[8]

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Another director argues that setting up a mismatch reserve is a much simpler and cost-effective strategy than the hedging strategy proposed by the other director.

ii. Comment on this statement.

[3]

iii. Discuss briefly the benefits to the insurer of performing an asset liability modelling (ALM) exercise.

[3]

[Total 14]

QUESTION 7

i. In the context of portfolio management, define the risk budgeting process.

[2]

A defined benefits pension fund has just completed a review of their investment strategy, including a risk budgeting exercise. The trustees have decided to switch from the current 100% active approach for their local equity portfolio to a 50% active, 50% passive approach.

ii. Give possible reasons for the trustees amending the equity portfolio's investment strategy in this way.

[3]

iii. Outline the factors to be considered by the pension fund in implementing the passive component of the portfolio.

[4]

In assessing the performance of a passive portfolio manager, the trustees notice that the portfolio has been underperforming the index it tracks by 25 basis points p.a. on average over the last 5 years.

iv. Suggest possible reasons for this underperformance.

[3]

v. Describe alternatives to full replication using multifactor models and derivates, for the management of a passive portfolio.

[3]

[Total 15]

END OF PAPER

