

EXAMINATION

14 November 2022 (am)

Subject F105 — Finance and Investment 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 Examyty 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 eight (8) 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 (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

Two life insurance companies are considering a merger.

- i. Outline possible reasons for such a merger.

[6]

The listed life insurer SolidRock has announced plans to acquire the listed life insurer Banana. SolidRock is well established, well capitalised, and pays regular dividends but has not been growing in the last couple of years. Banana has been growing at a high rate, reinvests most of their earnings, targets a younger generation, and makes extensive use of technology.

- ii. State and justify possible reactions to this news, from the following perspectives:

- a. The competition regulator;
- b. A value investor currently invested in SolidRock;
- c. A fund that pays tax on income but is exempt from capital gains tax, and is currently invested in Banana; and
- d. A hedge fund.

[6]

[Total 12]

QUESTION 2

The investments held by insurance companies in respect of savings policies are subject to regulations that specify maximum limits by asset class.

- i. Identify the form of regulation that this investment restriction can be classified as.

[1]

- ii. Outline the costs that may arise from this form of regulation.

[2]

- iii. Explain two reasons why the government may have these restrictions in place.

[2]

The regulatory restriction on offshore equity allocation by insurance companies was recently increased from 30% to 35%. In response to this change, an insurance company plans to increase their offshore equity allocation on the investment portfolio backing their savings product, to the maximum. They will achieve this by selling a local office building held in the investment portfolio and reinvesting the proceeds in offshore equity. All investment returns that are earned on the investment portfolio are allocated to the policyholders of this savings product.

- iv. Assess the implications of this decision for both the insurer and its policyholders.

[4]

Management proposes the use of futures derivative contracts to facilitate the implementation of the revised investment strategy.

- v. Outline the merits of this proposal.

[4]

PLEASE TURN OVER

- vi. Briefly outline the relative merits of top-down and bottom-up approaches to constructing the offshore equity component of the investment portfolio.

[2]

[Total 15]

QUESTION 3

- i. List the main characteristics of the DJIA and Nikkei 225.

[3]

You are an investment advisor to a pension fund with only locally-invested assets that has now decided to invest some of its assets offshore. The assets will be invested in a diversified selection of listed US equities and Japanese equities.

A trustee has suggested that for purposes of performance measurement of the offshore equity component of the fund, the fund should only use well-established stock market indices that have been developed and are maintained in that foreign country. He further recommends the use of the Dow Jones Industrial Average (DJIA) index for the US equities and Nikkei 225 index for Japanese equities.

- ii. Discuss the trustee's suggestion and whether there are any other indices you would recommend.

[6]

[Total 9]

QUESTION 4

International Petroleum (IP) is one of the world's leading oil groups involved in the refining and distribution of oil-based products.

- i. State the industry under the FTSE industry classification system that IP would fall into and outline the key characteristics of this industry.

[3]

An oil trader comments that Brent crude, the international benchmark oil price, is trading at a severe backwardation.

- ii. Explain the trader's comment, with reference to an equation that relates the futures price with the spot price of oil.

[2]

PLEASE TURN OVER

A group of developed nations have announced their agreement on the adoption of a new *carbon tax*. The tax is to be paid by companies based on the volume of greenhouse gasses they produce and funds raised are to be ring-fenced and applied as subsidies towards renewable energy projects. The process of refining oil produces large volumes of greenhouse gasses. Immediately following the announcement, IP's share price decreases marginally, while that of a competitor, Global Fuel (GF), decreases substantially.

- iii. Outline possible reasons for the different share price changes, by referring only to the factors that are generally considered in a fundamental analysis of a share.

[7]

[Total 12]

QUESTION 5

An investment fund's equity assets were split equally between two portfolios managed by different managers. The portfolio managers were given identical benchmarks (the market portfolio) and a similar degree of investment freedom, as expressed by maximum tracking error in the mandate. The two portfolios charge the same investment management fees. You have been given the following information for the last five years.

	Benchmark	Portfolio A	Portfolio B
Annualised gross return (before fund fees and trading costs)	8%	9.0%	9.0%
Annualised trading costs		0.5%	1%
Annualised standard deviation of net returns	18%	17%	12%
Beta		0.9	0.6

The risk-free rate over the five-year period was 5% p.a.

- i. Discuss the relative performances of the two portfolio managers.

[8]

- ii. Outline the three main corporate tax systems in use around the world.

[3]

In a particular country, wealthy individual investors are liable for tax on investment income at 40% and at 25% on capital gains, while all other investors pay 20% on all types of investment return.

- iii. Outline how the tax rates might influence wealthy investors' choice of investments.

[3]

[Total 14]

PLEASE TURN OVER

QUESTION 6

- i. Define technical analysis as an approach to managing an investment portfolio and state two methods used.

[2]

An investor recently inherited a large sum of money that she wishes to invest in local listed equity for her retirement in twenty years' time. She is deciding between appointing either

Manager A who applies technical analysis, and
Manager B who applies fundamental analysis.

The investor asks for your advice on choosing between the two approaches, explaining the differences in approach taken by the two managers.

- ii. Discuss your feedback to the investor.

[6]

[Total 8]

QUESTION 7

- i. Define liquidity risk for a financial services institution, and distinguish between gap analysis and duration analysis in identifying and measuring liquidity risk.

[3]

XYZ is a financial institution that has provided its future asset and liability cashflows below. Liability outflows are known and fixed and assets are invested in zero-coupon bonds.

Duration (years)	Asset proceeds (R millions)	Liability outflows (R millions)
10	10	115
11		110
12	50	10
13	200	
14		10

- ii. Assuming a 'cost of funds' rate of 3% p.a. effective for XYZ, calculate the liquidity risk elasticity (LRE), given a 1% p.a. increase in the 'cost of funds'.

[3]

- iii. Explain the implications of the result obtained in (ii).

[2]

- iv. Briefly outline three actions that could be taken by XYZ to reduce its liquidity risk, including one potential problem for each that may be encountered.

[3]

- v. Briefly outline two other financial risks (apart from liquidity risk) faced by XYZ based on the information provided above.

[2]

PLEASE TURN OVER

A director of XYZ has noted that XYZ is not making use of swaps in its portfolio.

- vi. Outline possible uses and benefits to XYZ of incorporating swaps in its portfolio. [2]

[Total 15]

QUESTION 8

A university plans to increase their annual intake of medical students substantially. Some building work is required, and this will be financed by a securitisation of future student fees.

- i. Define 'securitization' in this context. [1]

Construction is assumed to take one year, and for each of the ten years thereafter, 100 final-year medical students are chosen at random, and their tuition fees as paid for the year is transferred to the securitisation.

- ii. Discuss, with reference to the securitised cash-flows, how the instruments issued under the securitization might be structured. [5]

- iii. Outline how the yield on the most secure of the issued instruments might reflect the underlying investment risks. [2]

A wealthy benefactor has donated R25m into a trust with the purpose of paying for the tuition fees of 12 medical students each year, for as long as the funds last. The investment policy of the trust is to recognise the benefactor's wish that the trust's lifespan is at least 20 years. The board of trustees requested your guidance on the investment strategy for the funds.

- iv. Suggest a well-defined objective in this context for a stochastic asset-liability matching (ALM) exercise. [1]

Based on your advice, the board is considering two possible investment strategies:

- a) Using the current year's tuition fees for 12 medical students as a base amount, purchase an inflation-linked annuity product from a bank for as many years as the funds of R25m (net of a provision for general trust/administrative expenses) will allow.
- b) Match the projected nominal cash outflow over the next two years with fixed-term bank deposits. Place the remaining funds in a portfolio consisting of diversified liquid local and offshore shares, and update the matching annually.
- v. Discuss the advantages and disadvantages of the two investment strategies. [6]

[Total 15]

END OF PAPER