EXAMINATION

6 November 2023 (am)

Subject F105 — Finance and Investment Principles
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 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.*
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 nine (9) 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

A local fund manager expects bonds to outperform equities during the next year and considers making a tactical switch of 5% of his R1 billion portfolio from equities to bonds.

i. Describe the main characteristics of financial futures contracts.

[3]

ii. Suggest a future strategy for the switch.

[1]

iii. Outline the potential disadvantages of using futures rather than the cash market to carry out the switch.

[3]

[Total 7]

QUESTION 2

An engineering company has been awarded a government tender to construct and operate a solar farm to generate electricity.

i. Outline the key risks to an institutional investor of investing in this infrastructure asset insofar they relate to the:

a. Solar farm

[5]

b. Infrastructure asset class

[2]

A bond funding a private solar project pays a fixed rate coupon of 6% p.a. in arrears and has an outstanding term of three years. An investor holding R10 million nominal of the bond wishes to buy a swaption with the right to exchange the last two fixed payments for floating payments in one years' time.

The forward swap rate is 7% p.a., and the swap rate volatility is 0.25. The continuously compounded 2-year and 3-year spot rates are 6.0% p.a. and 6.5% p.a. respectively.

ii. Calculate the value of the swaption to the investor, using the approximation for phi (ϕ):

$$\Phi(z) \approx {}^{1}\!/_{\left(1 + e^{(-1.7\times z)}\right)}$$

[6]

[Total 13]

PLEASE TURN OVER

QUESTION 3

An investment manager's actively managed long-term Traditional Fund, which is designed for pension funds, contains only traditional asset classes. Due to the evolution of specialist asset classes, the investment manager is launching an Alternative Fund for which the allocation strategy would be the same as the Traditional Fund but focusing on specialist assets in each asset class.

i. Outline the risk and investment characteristics of each of the following specialist asset classes:

   a. Hedge funds
   b. Commodities

[6]

ii. Outline risk, legal and operational considerations for the manager in launching the new fund.

[6]
[Total 12]

QUESTION 4

A large, listed life insurance company is targeting for takeover a small, listed non-life insurance company that is underperforming compared to its competitors and which has been generating low rates of return for its shareholders.

i. State, and outline the key characteristics of, the industry of the acquiring company, and comment on how its industry classification may change following the takeover.

[4]

ii. State the ways in which the acquiring company can finance the takeover.

[2]

Poor corporate governance at the target company has been identified as the reason for its unsatisfactory performance.

iii. Discuss reasons why poor governance at the target company could have resulted in unsatisfactory performance and how the takeover can address this.

[4]
[Total 10]

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QUESTION 5

Under its mandate for banking regulation, the central bank in a developed economy requires retail banks to maintain capital equal to 2.5% of its liabilities.

i. Besides banking regulation, list four other areas of interest for a central bank.

[2]

A retail bank focuses primarily on extending credit to home buyers and small companies.

ii. With reference to the core stages of the actuarial control cycle, discuss how the central bank could regulate this bank during an economic recession to ensure that the bank remains solvent.

[6]
[Total 8]

QUESTION 6

The S&P 500 ESG Index is a broad-based, float-adjusted, market-cap-weighted index that is designed to measure the performance of securities meeting sustainability criteria, while maintaining similar overall industry group weights as the S&P 500.

i. State the main characteristics of the S&P 500 index.

[2]

ii. Describe the following terms related to indices and explain why each is relevant to the effective functioning of an index:

  a. Float-adjustment; and
  b. Rebalancing, including listing possible triggers.

[5]

Initially company X was included in the S&P 500 ESG index as it met the criteria for inclusion, but 12 months later it was removed from this index due to its "lack of a low-carbon strategy" and "codes of business conduct". It was the third largest company in the index by market capitalisation when it was removed.

iii. Comment on the impact of the removal of company X on an active investor who benchmarks their sustainability goals against the S&P 500 ESG index.

[5]
[Total 12]

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QUESTION 7

An investor is contemplating a large lump sum investment and shortlisted two equity managers, of which the most recent available performance information is as follows:

Manager	Year 1	Year 2	Year 3	Covariance with the equity market in Year 3
A	11.9%	6.9%	9.0%	0.48%
B	8.5%	4.0%	11.5%	0.36%

The equity market delivered a return of 26.5% over the last 3 years and 8.0% over the last year. For year 3, the standard deviation of the equity market was 6.5% and the risk-free rate was 3.75%.

i. For each manager calculate their out/underperformance relative to the benchmark (the equity market) over the 3-year period.

[2]

ii. Define two risk-adjusted performance measures based on the beta (β) of a portfolio and calculate their values for each manager over year 3.

[5]

iii. Comment on the results of parts (i) and (ii) and outline additional considerations in selecting a manager.

[4]

iv. Outline the circumstances in which standard deviation (σ) is a more appropriate measure of risk than beta (β).

[2]

[Total 13]

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QUESTION 8

An equity fund manager is responsible for a passive index-tracker fund, an active "growth" fund and an active "value" fund.

i. Define operational risk and outline four possible sources, with examples, of operational risk for the equity fund manager.

[5]

ii. Distinguish between "growth" and "value" equity management styles.

[2]

The performance of the funds is summarised below, where the annualised means and standard deviations (SD) are performance (net of costs) relative to its benchmark over the last 3 years:

Fund	Relative mean (% p.a.)	SD (% p.a.)
Passive equity fund	-0.002	0.2
Active 'growth' fund	0.5	1.5
Active 'value' fund	0.4	0.8

iii. For each fund determine the tracking error and information ratio. Comment on the performance of the funds.

[7]

iv. Explain how an investor might use the results of (iii) in a risk budgeting exercise.

[3]

[Total 17]

QUESTION 9

In a country with a sizeable number of high net-worth individuals, the government is reviewing the tax regime applicable to investments. The proposal is for a once-off 'wealth' tax to be levied as a percentage of an individual's net worth above a threshold.

i. Outline three forms of taxes that could be levied on investments.

[3]

ii. Discuss the factors to consider in setting the threshold and the practical difficulties of implementing the proposal.

[5]

[Total 8]

END OF PAPER