EXAMINATION

7 June 2021 (am)

Subject F105 — Finance & Investment
Fellowship Principles

Time allowed: *Three hours and fifteen minutes, plus an additional five minutes to allow for scrolling in the ASSA Exam Platform*

Total marks: *100*

INSTRUCTIONS TO THE CANDIDATE

1.   *Ensure that you are logged in and authenticated through Examity before you attempt the examination.*

2.   *Questions are only available in the ASSA Exam Platform and may not be printed.*

3.   *Submit all of your answers in the ASSA Exam Platform only. No uploads of answers (handwritten or otherwise) to the ASSA Exam Platform will be accepted.*

4.   *You may not use any other computer program (e.g. Email, MS Word or Excel) or files, nor open any other browser during the examination.*

5.   *You may not make use of a Formulae and Tables book during the examination. Any such information that may be required will be provided to you within the examination.*

6.   *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.*

7.   *Mark allocations are shown in brackets.*

8.   *Attempt all eight (8) questions.*

9.   *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.*

10.   *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.*

11.   *You must submit all work 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 if you are connected to the ASSA Exam Platform. 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

You are an asset manager and are reviewing your portfolio in light of climate change.

i.   Explain the difference between carbon credits and other commodities such as gold.

[2]

In your fund you continue to hold a significant position in a share that has underperformed for a number of years. A number of your fund investors are accusing you of displaying behavioural biases.

ii.   Outline briefly three different possible behavioural biases that may explain your decision to continue holding this underperforming share.

[3]

Your portfolio includes A-rated corporate bonds of companies located in an area that has become exposed to regular catastrophic hurricanes.

iii.   Discuss the risk to your portfolio and explain a derivative strategy you can apply to gain protection.

[3]

[Total 8]

QUESTION 2

i.   Define liquidity risk for a business.

[1]

MNF is a local manufacturing company and has just completed their long-term financial planning.

ii.   Describe how the manufacturing company can assess their ongoing liquidity requirements.

[3]

MNF foresees a cash shortage three months from now, when a creditor payment is due. They expect to receive sufficient debtors' payments two months later.

iii.   Outline two transactions the company can consider to improve their liquidity in this situation.

[2]

iv.   Identify one financial risk (other than liquidity risk) in each of the transactions in (iii) and explain how it can be mitigated.

[2]

v.   List four additional business practices, other than those mentioned in (iii), that the company can adopt to improve future liquidity.

[2]

[Total 10]

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QUESTION 3

With rapidly deteriorating economic conditions, an investor with no property exposure in his portfolio wants to gain from, what he believes to be, an overly-inflated housing market using a real estate exchange traded fund (ETF).

i. Describe two strategies the investor can implement to profit from his conviction, stating the maximum potential gain and loss to the investor from each of the strategies.

[4]

The investor has managed to secure access to financing to fund a derivatives strategy.

ii. Outline the investor's considerations in deciding on whether to use the funding to act on his convictions.

[3]

[Total 7]

QUESTION 4

i. State the principal aims of regulation.

[2]

Beg&Borrow (BB) is a new online platform where small local start-ups can issue unlisted shares and debt to the general public. New issues are announced one week in advance. Instruments are allocated to investors via an on-line auction. This private online debt and equity (PODE) market is currently unregulated. BB's country of operation has well-regulated listed stock and bond markets.

The Financial Services regulator is drafting statutory regulation for the PODE market.

ii. Describe the advantages and disadvantages of statutory regulation for the PODE market.

[2]

iii. Outline four areas in which regulations might be made for the PODE market, and explain in each case how the regulation would reduce the risk of market failure.

[6]

Based on issuer demand, BB expands their offering of instruments to include zero-coupon convertible bonds.

iv. Compare this new instrument with a traditional with-coupon bond, from the perspective of the issuer.

[2]

PLEASE TURN OVER

OnlineBooks (OB) is currently funded by equity only, with 1,000,000 issued shares. OB wants to issue a five-year zero-coupon bond, with a notional of R2m, that can be converted into equity after five years, at the option of the bond holders. The conversion basis is 1 share per R4 bond notional.

v.   The convertible bond is issued. Let A denote the total value of OB's assets after five years, immediately prior to the bond maturing.

     a.   Calculate the value of A at which bondholders will convert their holdings into shares.

The assets of OB (before the bond issue) are valued at R3m. The bond is issued at a price of 80% (i.e., 80 per 100 notional).

     b.   Calculate OB's asset value immediately after the bond issuance.

     c.   Calculate the annualised return of the convertible bond for each of the following three fixed levels of annualised asset growth over the 5 years: -20% p.a., 0% p.a., and 30% p.a.

[5]

[Total 17]

PLEASE TURN OVER

QUESTION 5

i.   List the main South African equity indices that comprise the FTSE/JSE Africa Headline Indices.

[2]

A passive equity fund manager claims to be using multifactor models to track the performance of an equity index.

ii.   Explain what a multifactor model is, and how these could be used by passive equity portfolio managers.

[5]

The fund manager provides the following information about his fund holdings. There were no inflows or outflows from the fund during the period.

Market value of fund holdings (R millions)

	Resource shares	Financial shares	Industrial shares	Total Fund
31.12.2019	180	250	300	730
31.12.2020	200	230	325	755

The equity index being tracked by the fund manager comprises sub-indices for the resources, financials and industrial industries. The weights of these sub-indices in the overall index are shown below together with their total return indices.

Weights and Total return indices for market sub-indices

	Resources index	Financials index	Industrials index
31.12.2019 Weights	15%	35%	50%
31.12.2019 TRI	3500	1200	950
31.12.2020 TRI	3750	1100	1050

iii.   Calculate total returns for both the fund and the overall index being tracked, stating any assumptions made.

[2]

iv.   Attribute the fund manager's performance between industry selection and stock selection.

[6]

v.   Noting any other features of the performance, comment on the fund manager's performance.

[5]

[Total 20]

PLEASE TURN OVER

QUESTION 6

    i.   Define absolute and relative approaches to asset pricing, providing an example of each approach.

[2]

Top-notch asset managers (TAM) manage a portfolio of infrastructure investment projects. Investors in the portfolio are allowed to withdraw their investment at any time by providing six months' notice.

    ii.   State two uses of an asset pricing model to TAM.

[2]

TAM is evaluating an investment opportunity in a toll road project in the Western Cape. They propose using an absolute pricing model with the following structure,

$$p(t) = E(t)[m(n) \cdot x(n)]$$

    iii.   Define and interpret this equation.

[3]

    iv.   List six data series that could be used in computing $p(t)$.

[3]

Six months into the operation of the toll road, TAM realises their income projections significantly underestimated the difficulty associated with toll collection.

    v.   Discuss briefly the implications of this on the portfolio and possible remedies.

[4]

[Total 14]

QUESTION 7

i.   Explain briefly which of the two types of bond portfolio switches are more likely to be carried out by the following type of investor:

    (a) A liability driven investor, investing in bonds to match liabilities of a particular duration.

    (b) An unconstrained investor, who is investing in bonds to maximise returns relative to a short-term interest rate benchmark.

[2]

ii.   Explain why an analysis of reinvestment rates might mean an investor favours investment in a 10-year bond with a 5% coupon over investing in a 20-year bond with a 10% coupon, when the yield on the longer bond is 0.5% p.a. higher.

[2]

iii.   Outline the processes involved in assessing whether there is a potential yield difference between a 10-year AA rated corporate bond and a 10-year government bond that can be exploited.

[2]

[Total 6]

PLEASE TURN OVER

QUESTION 8

A defined contribution fund is conducting a review of its investment strategy. The objective of the fund is "to provide members with an income in retirement of not less than 75% of their final salary". This is referred to as a 75% replacement ratio. The trustees appreciate the uncertainty associated with certain underlying investment strategies, but have suggested that they would like to achieve this objective with a 90% chance of success. (The objective assumes a member who has contributed for their full working lifetime at the rate prescribed by the fund.)

The chairman of the fund has heard of the concepts of asset liability modelling (ALM) and value-at-risk (VaR) being used as tools to derive a suitable final investment strategy.

i.   Briefly define ALM and VaR.

[2]

ii.   Explain how ALM could be used to find the optimal asset allocation for the fund in terms of each of the main asset classes.

[3]

The ALM exercise has now been completed.

iii.   Explain briefly why the trustees might deviate from the optimal asset allocation suggested by the ALM exercise.

[1]

iv.   Explain how the trustees could perform a risk budgeting exercise to arrive at their final investment strategy, highlighting the role of VaR in this exercise.

[3]

The trustees have now drawn up a risk budget. Implementing the risk budget requires a number of implementation considerations and decisions.

v.   Describe the range of possible strategies which may result from the risk budgeting exercise, highlighting important considerations which the trustees should take into account in arriving at and implementing these.

[9]

[Total 18]

END OF PAPER