INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

19 April 2023 (am)

Subject SA7 – Investment and Finance
Specialist Advanced

Time allowed: Three hours and twenty minutes

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator.

If you encounter any issues during the examination please contact the Assessment Team on T. 0044 (0) 1865 268 873.

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1 Oasis is a specialist wealth management firm offering high returns on investments to high-net-worth individuals. Oasis sources personal loans from a panel of banks and places them in different funds that represent the level of risk of the loans. Investors in Oasis's funds can then choose which fund to invest in based on their risk appetite. Oasis will create three funds as outlined below:

Fund	*Credit quality*
Senior	Highest
Junior	Medium
Equity	Lowest

(i) (a) Discuss the key considerations for Oasis when they place loans in different funds. [3]

(b) Outline why the proposed fund structure would be attractive to potential investors. [2]

(c) Outline the concerns for a potential investor in these funds. [3]

[**Hint:** Consider the risk and return of the funds.]

Oasis is considering creating a fund of funds that invests in the funds listed above in the following proportions:

Fund	*Proportion of fund (%)*
Senior	70
Junior	25
Equity	5

(ii) Discuss how the proportions of the three funds will impact the returns that investors in the fund of funds will receive. [5]

After the funds are launched, Oasis decides to offer interest-only and principal-only versions of their senior and junior funds.

(iii) Describe the impact of the following risks on portfolio returns earned by investors:

(a) pre-payments

(b) default.

[4]

(iv) Which categories of investors are likely to be impacted by pre-payment risk? [2]

After a decade of providing high returns to high-net-worth investors in their funds, Oasis is looking to expand their client base to include less affluent customers. Their marketing team have created materials that show the past performance of their funds, together with the following two risk metrics:

- The excess return relative to the risk-free rate
- The excess return relative to a specified target return.

(v) (a) Explain the importance of risk metrics for the purposes of comparing investments. [3]

(b) Outline the suitability of each of the metrics described above to assess the investment risk associated with the funds. [4]

A senior executive at Oasis has asked the marketing team to include Value at Risk (VaR) metrics in the marketing materials. In addition, the senior executive has indicated that Tail Value at Risk (TVaR) should be included in the marketing materials.

(vi) (a) Explain VaR and outline the challenges of calculating it for these funds. [4]

(b) Outline the limitations of using VaR for these funds. [4]

(c) Outline the limitations of using TVaR for these funds. [2]

[Total 36]

2 Following a global pandemic, central banks around the world used unprecedented policies of Quantitative Easing (QE) to support the global economy.

This policy successfully inflated economic activity, and following the creation of a vaccine, the risks to economic activity are considered to have significantly diminished. There has been a significant increase in inflation, albeit it is expected to be transitory by many economists.

In particular, asset prices have increased to levels where historic valuation methods suggest that prices are 'elevated'.

In response, central banks have decided to 'taper' the QE programmes, reducing the amount of assets they are purchasing each month.

Discuss the likely impact of the tapering on:

(i) economic growth. [3]

(ii) consumer price inflation. [4]

(iii) asset prices. [3]

(iv) defined benefit pension schemes. [3]

The policy of QE has resulted in a large percentage of both sovereign and corporate bonds with negative yields to maturity.

(v) Discuss the dilemma facing bond investors in such an environment. [6]

[Total 19]

3 (i) Describe, in your own words, the psychological concept of ego. [3]

(ii) Compare, in your own words, the difference between a healthy ego and an unhealthy ego from the perspective of investment psychology and explain the importance of the concept in trading. [5]

A new electric car company has seen significant share price appreciation in recent years. As a result, traditional valuation metrics indicate that the company is currently overvalued. One investor concluded that the share price was in a bubble, based on having watched a television documentary about the business, and decided to 'short' it, resulting in repeated and significant losses.

(iii) Compare the different potential narratives of investors in the company, and comment on their potential shortcomings. [6]

(iv) Discuss the investment psychology of the investor and their short-selling strategy. [6]

[Total 20]

4 Following a recent referendum, a mid-sized developed country (Midland) is to split into two different countries on a future date, denoted 'Independence Day', while retaining freedom of movement and a tariff-free trade zone. The two new countries have the following characteristics:

	Lowland	*Highland*
Population	40 million	10 million
Gross domestic product (US$)	2 trillion	0.4 trillion
National debt (US$)	1.2 trillion	0.3 trillion

Lowland will retain Midland's legacy currency (the Midland dollar), but it will be renamed to the Lowland dollar (L$). Highland will create a new currency called the Highland dollar (H$). The H$ will initially be struck at parity with the L$, but its exchange rate will float freely from Independence Day. On Independence Day, each Midland bond will be split into 0.8 L$ bonds (issued by Lowland) and 0.2 H$ bonds (issued by Highland). Both bonds will have the same maturity date.

The National Farmers Insurance Company (NFIC) has a US$ 200 billion balance sheet and operates in both countries. Following Independence Day, its liabilities will be 90% H$-denominated, as the vast majority of its longer-term insurance liabilities are in respect of policies issued in Highland. Currently, its liabilities are fully hedged using government and corporate bonds issued in Midland dollars, and as part of its asset liability matching arrangements, it makes use of repurchase agreements to allow a leveraged Midland government bond portfolio to be maintained.

(i) Describe the immediate impact of independence from an asset liability matching perspective. [6]

(ii) Explain how the asset liability matching policy will need to change following Independence Day. You should assume that regulatory capital requirements are identical in Lowland and Highland from the current Midland requirements, which is based on Solvency II. [9]

NFIC's head of responsible investment has been reviewing the impact of the referendum on its US$ 50 billion green bond portfolio, which largely comprises green Midland government bonds. A key input into the portfolio construction process is the green bond rating produced by a third-party ratings agency, who have said that they will suspend their ratings for legacy Midland government bonds for a 12-month period following Independence Day. They have asked an investment actuary in their team to help determine internal climate risk ratings for the green Midland government bonds once they are converted to Lowland and Highland bond issues. The internal rating scale is:

Rating	*Description*
Grey (lowest)	No meaningful differences to non-green bonds.
Light green	Funds raised will be used for purposes that are environmentally friendly but do not achieve progress towards a low carbon future (e.g. efficiency improvements for fossil fuel infrastructure).
Medium green	Funds raised will be used for purposes that achieve progress towards a low carbon future (e.g. hybrid vehicle factory).
Dark green (highest)	Funds raised by the bonds will be used for purposes consistent with a low carbon future (e.g. wind farms).

(iii) (a) Set out the considerations for the internal team to assign ratings on the above scale to the Highland and Lowland bonds. [6]

(b) Identify some of the complexities the internal team will need to address in assigning ratings to the bonds. [4]

[Total 25]

END OF PAPER