INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

22 September 2022 (am)

Subject SP5 – Investment and Finance Specialist Principles

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.

© Institute and Faculty of Actuaries

1 A bond of nominal value 100 pays annual coupons of 2.5 per year. The first payment is exactly 1 year from today. Annualised zero-coupon yields prevailing in the market are shown in the table below and the bond is repaid at par after 5 years.

Time	1	2	3	4	5
Zero-coupon yield (%)	0.35	0.50	0.65	0.75	0.85

(i) (a) Calculate, showing your workings, the gross redemption yield on the bond to three decimal places.

(b) Calculate, showing your workings, the par yield to three decimal places.

[4]

The Trustees of a pension fund decide to hedge its liabilities by buying and holding an investment in a pooled index-tracking government bond fund. There are no other assets.

	Liabilities	*Assets*
Present/market value	100m	90m
Duration (years)	20	22
Prevailing yield at corresponding tenor	1.50%	1.55%

(ii) Discuss the effectiveness of this strategy for hedging interest rate risk. [8]

The plan sponsor has agreed to meet the funding shortfall over a 3-year period.

(iii) Comment on the other main considerations the Trustees should consider before following this approach. [3]

[Total 15]

2 The Board of Trustees of a pension fund are considering whether to invest part of the pension fund's assets in alternative assets.

(i) Describe the issues the Trustees should consider before proceeding. [7]

The Trustees of the pension fund are specifically considering the following types of alternative assets:

- private equity
- art
- cryptocurrency.

(ii) Discuss how the issues described in part (i) influence the decision of whether or not to invest in the alternative assets listed above. [9]

[Total 16]

3 A life insurance company is reviewing the risks in the investment portfolio it is holding to back its liabilities.

(i) List the main investment risks for the life insurance company. [6]

(ii) Suggest possible actions that the life company could take to manage the risks identified in part (i). [6]

[Total 12]

4 A large mining company, ABC Mining, whose operations are in Europe, is considering the purchase of a large mining company in Asia.

(i) Suggest possible reasons why ABC would consider this. [5]

(ii) Discuss the risks ABC will face if they adopt this strategy. [6]

(iii) Suggest possible ways that ABC could assess the value of the target company. [4]

[Total 15]

5 A wealthy investor with a diversified portfolio of assets has decided to switch their equity holdings from a tracker fund tracking the S&P 500, into an actively managed fund. The remainder of the assets will not be changed. Having done some research, the investor has produced a short list of four actively managed equity funds run by managers, A, B, C and D, that they are considering investing in.

The 5-year track records of the four Managers are:

Investment return (% p.a.)					
Fund	*Year*				
	1	*2*	*3*	*4*	*5*
A	2.5	4	5	6.5	4
B	6	3	4	4	4
C	4	–3	6	11	8
D	4	3	4	4	5
S&P 500 Index	4	2.5	3	4	4

(i) Calculate the performance of the Managers relative to the S&P 500 Index over the 5-year period. [4]

The co-variances of the funds with the index over the 5-year period are:

A	*B*	*C*	*D*
0.4	0.3	0.5	0.4

And the standard deviation of the index over the 5-year period is 0.5.

You may assume a risk-free rate of 1.5% p.a. and ignore fees.

(ii) Calculate, showing all workings, the risk-adjusted performance of the Managers for the 5-year period using the Jensen measure. [4]

(iii) Explain why the Jensen measure was an appropriate measure to use in these circumstances. [2]

(iv) State which other risk-adjusted performance measure may also be used. [1]

(v) Discuss the performance of the four Managers. [2]

(vi) State, with reasons, which of the four Managers would be most appropriate for the investor. [3]

[Total 16]

6 The Financial Regulator in a large developed country has identified three types of risk associated with climate change:

- physical risks
- transition risks
- liability risks.

(i) Describe, in your own words, these three types of risks. [6]

(ii) Discuss how the risks described in part (i) may impact an international car manufacturer. [8]

[Total 14]

7 (i) Explain the difference between alpha and beta in the context of fund performance. [2]

A Fund Manager has decided to launch an absolute return fund.

(ii) Describe how the Fund Manager may construct such a fund. [5]

(iii) Discuss the issues the Fund Manager may face in managing an absolute return fund. [5]

[Total 12]

END OF PAPER