EXAMINATIONS

11 April 2002 (pm)

Subject 401 — UK Fellowship Investment

Paper Two

You must answer this subject only, you may not attempt another subject in the 400 series.

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of your answer booklet.*

2. *You have 15 minutes at the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You then have three hours to complete the paper.*

3. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*

4. *Mark allocations are shown in brackets.*

5. *Attempt both questions, beginning your answer to each question on a separate sheet.*

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet, with any additional sheets firmly attached, and this question paper.

In addition to this paper you should have available Actuarial Tables and your own electronic calculator.

1 You are an actuary working as an investment consultant to pension scheme trustees. You have just been appointed by the trustees of a large defined benefit pension scheme, whose investments are currently managed by two multi-asset investment managers. Both are operating according to the same performance benchmark with a performance target of benchmark +1% per annum measured over rolling three year periods. The benchmark, alongside the two managers' tactical asset allocations (reviewed annually at the start of each year and left unchanged for the year) is set out below:

	Year 1			*Year 2*		
	Manager A	*Manager B*	*Benchmark*	*Manager A*	*Manager B*	*Benchmark*
	%	*%*	*%*	*%*	*%*	*%*
UK equities	56.4	46.0	56.4	57.2	54.7	55.9
Overseas equities	15.7	13.9	16.6	22.6	14.4	22.8
Index-linked gilts	1.7	1.8	1.2	1.0	2.2	0.8
UK bonds	8.0	5.4	9.4	7.3	5.5	8.0
Overseas bonds	8.5	12.4	7.6	7.3	16.4	7.3
Cash	9.7	20.5	8.8	4.6	6.8	5.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

	Year 1			*Year 2*		
	Manager A	*Manager B*	*Benchmark*	*Manager A*	*Manager B*	*Benchmark*
	£m	*£m*		*£m*	*£m*	
Start year fund value	490	370	—	510	389	—
End year fund value	510	389	—	556	405	—

Performance data (all time weighted returns) for the managers for the last two years are shown in the following table:

	Year 1			*Year 2*		
	Manager A	*Manager B*	*Benchmark*	*Manager A*	*Manager B*	*Benchmark*
	%	*%*	*%*	*%*	*%*	*%*
Total return	4.9	4.0	6.7	12.9	7.7	13.0
UK equities	3.5	–2.0	5.0	10.9	10.7	10.6
Overseas equities	4.8	8.8	8.6	38.4	17.5	37.8
Index-linked gilts	11.6	16.6	16.8	6.8	—	4.5
UK bonds	15.4	13.0	15.7	–0.1	1.1	0.4
Overseas bonds	9.7	8.7	10.8	–6.1	–1.7	–2.6

Both managers held cash balances in money market instruments achieving 5% per annum in each of years 1 and 2.

(i) Your first task following your appointment is to write a paper reviewing the performance of managers A and B in their current roles. To gather data for this paper you will need an attribution analysis going back a number of years.

(a) Write out a methodology that could be used by your team to prepare a spreadsheet that could be used to attribute the historic performance data to the main areas of interest. [2]

(b) Apply your methodology to the data for year 2 and comment on the results. [8]

(ii) As well as an attribution analysis, you will carry out an investment style analysis of each of the UK equity portfolios.

(a) Describe what is meant by "investment style" and explain why it can be important. [3]

(b) Each fund manager is able to give you full details of their holdings. List the financial data you would extract and describe how you would carry out an investment style analysis. [5]

(iii) The final part of your analysis of the two managers will cover the risks associated with their management. The following information ratios have been calculated for each manager based on quarterly data for the last five years:

	Information Ratio
Manager A	−0.5
Manager B	−1.1

Define the term "information ratio" and comment on the ratios for each of managers A and B. [3]

(iv) Comment briefly on the other areas you would cover in your paper. [4]

The presentation of your first paper has coincided with the results of the latest actuarial valuation. The pension scheme's funding level has deteriorated in the three years since the last valuation. The deterioration has been so sharp that contributions (previously expected to be suspended for the foreseeable future) are likely to have to resume at the next actuarial valuation date unless the situation improves. This news, alongside your report has prompted a full review of the investment arrangements.

(v) Drawing on the information above, state the possible investment reasons for the deterioration in the level of funding. [2]

(vi) Your second report will contain sections on the following aspects of the investment arrangements:

Strategic asset allocation;
Investment manager structure.

The discussion will be based on the current trustee objectives which are set out below:

The trustees' main objective is to meet benefit payments as they fall due. Subject to meeting this objective, the desire is to control the level and variability of company contributions to the scheme.

Where possible, the trustees will seek to maximise return relative to investment performance benchmark.

(a) Comment on these objectives suggesting additional issues to consider in your review. [2]

(b) Outline the key decisions that would be required following consideration of the section on "strategic asset allocation". [4]

(c) Describe how you would use deterministic and stochastic models to help establish a strategic asset allocation that meets the Trustees' objectives. Indicate which decisions identified in b) would be most likely to be aided by modelling techniques. [5]

(d) On the basis of the information given, comment on the likely direction of any changes in the strategic asset allocation. [2]

(vii) Discuss the main options to be considered within the section on "investment manager structure". (Do not draft your report.) [5]

(viii) Comment on the remaining steps required to complete the full review of the investment arrangements. [5]
[Total 50]

2 (i) Specify four risk adjusted performance measures and comment on their possible uses and limitations. [10]

(ii) A highly specialised fund manager invests his clients' money in UK Treasury bills and writes deep out-of-the-money call and put options on the FTSE 100 index. At the beginning of each month, he writes an equal number of one-month, out-of-the-money call and out-of-the-money put options on the FTSE 100 index. The strike prices of the call options are chosen to be 2.5 standard deviations above the current value of the index and those of the put options 2.5 standard deviations below the current value of the index. He invests the option premiums in UK Treasury bills. Each month he writes sufficient options to generate a return of 1.5 times the expected return on his UK Treasury bill portfolio for that month.

(a) Discuss the additional information that you would need to obtain before you could make a judgement as to whether you could rely on a risk adjusted performance measure in assessing the manager's performance. [8]

(b) Discuss the use of the Sharpe ratio as a measure of the manager's risk-adjusted returns. [13]

(iii) The investment strategy of a portfolio is to buy convertible loan stocks and sell short the equity securities underlying the convertibles.

Discuss the risks and return potential inherent in this investment strategy. [19]
[Total 50]