INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

27 April 2011 (pm)

Subject SA6 — Investment Specialist Applications

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 before 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 all three questions, beginning your answer to each question on a separate sheet.*

6. *Candidates should show calculations where this is appropriate.*

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 the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.

1 (i) Describe what is meant by Quantitative Easing (QE). [5]

Following a period of sustained economic growth over a number of years, driven mainly by a credit bubble resulting in significant increases in money supply, a country has experienced a deep recession following the collapse of the credit bubble. The credit bubble had resulted in a stock and property market bubble also.

In response the country's Central Bank cut interest rates significantly. This succeeded in stimulating the economy somewhat, but the economy then went back into recession. In response the Central Bank decided to initiate a strategy of Quantitative Easing.

(ii) Discuss the likely impact that the Central Bank's strategy will have on:

(a) the domestic bond market.
(b) the domestic equity market.
(c) the country's exchange rate.
(d) economic growth.
(e) inflation. [25]

Two years after the introduction of the QE strategy, the country's bond and stock markets experienced significant increases, as the increases in money supply mainly flooded into asset markets. However, following signs that inflationary expectations had risen significantly, long term bond yields rose significantly, and the Central Bank increased short term interest rates.

(iii) Explain the likely initial implications of the QE strategy on domestic defined benefit pension funds and the follow-on implications of significant increases in interest rates and bond yields. [20]

[Total 50]

2 (i) Describe the economic return to an investor who buys a gilt and then puts it on repo. [4]

(ii) Explain how gilts and gilt repos can be used to build an interest rate hedge for an investor's liabilities. [6]

(iii) Discuss the weaknesses of a hedge constructed using a gilt plus repo approach compared with a cash/bonds plus swaps approach. [10]

(iv) Outline the circumstances in which it would be beneficial for an investor to construct a hedge using a gilt plus repo approach rather than cash/bonds plus swaps approach. [4]

You are given the following historical asset values for a pension fund that entered into a gilt repo programme in late 2006. The fund's liabilities were fully hedged using gilts, some of which were financed through repo transactions, and are measured using the gilt curve. You may assume that there have been no liability payments or contributions received over the period and that the gilt-based hedge has mirrored the changes in the liabilities.

		£m	
	Gilts on repo	*Gilts owned*	*Other assets*
31/12/2006	600	800	600
31/12/2007	625	875	620
31/12/2008	650	750	475
31/12/2009	665	935	580
31/12/2010	680	1070	600

(v) Calculate the return on the fund's assets and change in liabilities for each year and over the whole period. [6]

(vi) Comment on the development of the funding level over the period. [2]

[Total 32]

3 A published index is calculated by reference to the total return achieved by investing in the nearest to expiry futures contract in a pre-specified basket of commodities. Where a futures contract on any commodity is due to expire in the next month, the index position is assumed to be rolled over into the next maturing futures contract on that commodity at a rate of 20% per day during the fifth to the ninth business days of the calendar month.

(i) Explain why it is preferable to base the index construction on a roll process that is spread over five days rather than:

(a) a single day (e.g. the fifth business day of the month).

(b) a roll of 6.25% per day during the first sixteen business days of the calendar month.

[4]

An Exchange Traded Fund (ETF) manager has launched an ETF that tracks the above commodities index by holding the underlying futures contracts and cash.

(ii) State why the performance of the ETF might differ from that of the index. [2]

(iii) State how the ETF manager could create a more capital efficient structure by permitting borrowing. [2]

(iv) Describe the key risks that an investor in the ETF is exposed to, assuming borrowing is permitted. [3]

An active commodities manager has launched a fund that she claims will outperform this index with a low tracking error and that her methodology is robust to changing market conditions. The fund is permitted to invest in the four nearest to expiry futures contracts in the various commodities (with no restrictions on the weightings) and cash, using derivatives to hedge commodity or currency risks. Leverage is not permitted. The active manager feels the constraints are too restrictive.

(v) Describe the main ways in which the active manager could generate alpha in such a fund both with and without the current constraints. [7]

[Total 18]

END OF PAPER