INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

23 September 2014 (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 new page.*

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 An industry wide group of insurance companies and pension funds has responded to UK government requests to set up a panel of investors who are committed to invest in open-ended funds that will participate in projects to help upgrade the national infrastructure. One of the unique attractions of these funds is that they will have preferential access to projects due to the government's involvement.

Two such funds are to be set up, investing in transport projects (roads, railways, bridges, airports) and clean energy projects respectively. As the funds are open, there will be future rounds of fund-raising, with the first £20bn expected to take three years to invest. Both funds will invest in the debt issued by such projects, with the government funding the equity (10%–20% of each initial investment). The government does not plan to hold the equity significantly beyond the development phase of the projects. Initial investors in the funds at launch date will have preferential rights to participate in any Initial Public Offering or placement of the equity at a future date in proportion to their initial investment (these rights can be sold in the open market).

You are the Chief Investment Officer of a £20bn UK pension fund, with a target £1bn allocation to infrastructure equity, and can also invest in infrastructure debt within the £10bn fixed income portfolio. The funds have each reached 75% of their target commitments, and you are considering whether to make a £1bn commitment to the transportation fund and a £500m commitment to the clean energy fund.

You have been asked to prepare a full report to the pension fund's Investment Committee before they will consider making an allocation of this size. The Investment Committee has asked you to cover all relevant aspects, including:

- the general characteristics and risks of investing in infrastructure.
- the risks and benefits of investing in the new funds, as opposed to a typical fund in the infrastructure sector (closed-ended, target size of £1bn to £2bn).
- agency issues and alignment of interests due to government involvement.
- reasons for the chosen allocation sizes.
- views on being an initial investor.

Set out the points that should be included in your report, covering the specific issues identified along with the more general considerations. [42]

2 You are working as an equity analyst for ABC Fund Managers. The share price of Big Mortgage Bank (BMB) has recently attracted the attention of the Chief Investment Officer (CIO). He has therefore asked you to carry out some analysis of the company's share price, with a view to ABC potentially making a significant investment in it.

BMB operates in the country of Actuaria. The country has experienced a major financial boom followed by a severe financial and economic crisis in recent years. This caused a severe recession, with large increases in unemployment, along with significant falls in average house prices.

Many mortgage holders who bought houses during the boom have found themselves unable to meet their mortgage repayments and are now in default. Most of these are in "negative equity" – the outstanding mortgage is greater than the market value of the property. BMB has set aside reserves to cover the losses from its mortgage book, and this has nearly bankrupted it. BMB expects that it will take an average of two years to re-possess and sell the property related to each defaulted mortgage.

In response to the crisis, the Central Bank of Actuaria initiated a policy of Quantitative Easing, which has stabilised house prices and recently led to an increase in house prices (along with increases in other asset prices in Actuaria).

(i) Describe what is meant by Quantitative Easing. [4]

(ii) Explain why Quantitative Easing might result in rising asset prices. [6]

You are given the following information about BMB:

- 18,000 mortgages with an average mortgage of Act$450,000 are in default. These mortgages relate to properties with an average value of Act$250,000.

- Mortgages sold more than eight years ago – before the financial boom: net interest margin of 2% i.e. if the net cost of funding for the bank was *X*% (covering both funding and overheads), the mortgage interest rate was (*X*+2)%. Number of mortgages outstanding: 40,000. Average term remaining: 5 years. Average value of each mortgage Act$150,000, with an average property value of Act$250,000.

- The mortgage market became very competitive during the boom. Mortgages sold during the financial boom (between two and eight years ago): net interest margin of 0.75%. Number of mortgages outstanding: 30,000 (net of those in default). Average term remaining: 20 years. Average value of each mortgage Act$420,000, with an average property value of Act$250,000.

- Bank lending has become extremely conservative in recent years and bank margins have increased significantly to rebuild new capital reserve requirements. Mortgages sold in the last two years: net interest margin of 4% i.e. if the cost of funding for the bank was *X*%, the mortgage interest rate was (*X*+4)%. Number of mortgages outstanding: 4,000. Average term remaining: 26 years. Average value of each mortgage Act$200,000, with an average property value of Act$250,000.

The average house price in Actuaria near the top of the boom was Act$500,000 – it has since fallen to approximately Act$250,000. Before the boom, the average mortgage loan-to-value ratio at loan inception was 80% but due to competition in the market, and changes to regulation, it was approximately 100% during the boom. In the last two years it has reduced to an average of 80%. House prices have stabilised in the last year and house prices are now expected to rise by approximately 10% next year (sparking the interest in BMB by the CIO).

You can assume a discount rate of 5% p.a. There are 1 billion issued shares of BMB.

All mortgages are interest only – the principal is repaid by an endowment policy taken out by the borrower with an insurance company. When the mortgage goes into default, the endowment policies are surrendered to BMB and the figures related to the defaulted mortgages are net of such surrender values.

(iii) Estimate the value of the reserves that BMB needs to set aside to cover the mortgages in default, stating any assumptions that you make. [3]

(iv) Estimate the net present value of the cash flows related to the mortgages sold by BMB, stating any assumptions that you make. [4]

(v) (a) Estimate the share price of BMB, explaining your approach and any assumptions that you make.

(b) Discuss the other factors that should be considered when evaluating BMB. [11]

(vi) Estimate the sensitivity of the bank's share price to a 10% fall in house prices next year. [3]

The current share price of BMB is Act$0.1.

(vii) (a) Outline your recommendation to the CIO.

(b) Discuss the other factors which could be considered in making such a recommendation. [6]

[Total 37]

3 You are the investment consultant to a £300m defined benefit pension fund sponsored by a large domestic industrial company that has grown its business organically very rapidly in the last 15 years. A new trustee has just been appointed to the board. The new trustee recently joined the company as treasurer from a competitor in the same industry. The competitor company is a subsidiary of a multi-national group, although its operations are of a similar size due to a series of acquisitions in the last five years.

Following the triennial actuarial valuation, the trustees have decided to review the pension fund's investment strategy and have asked you for a quote. The new trustee is somewhat surprised at the cost you have proposed, arguing that they should simply target their competitors as they do in every other part of the business.

The pension fund secretary is keen to get your budget approved as the year end approaches and has asked you to help him prepare a response to the trustees' finance committee.

(i) Explain how and why the investment strategies should vary between the two companies' respective pension funds and over time. [15]

(ii) Discuss how the financial strength of the sponsor should influence the trustees' tolerance of investment risk. [6]

[Total 21]

END OF PAPER