INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

12th May 2008

Subject SA6 – Investment

Time allowed: Three Hours (09:45* – 13.00)

INSTRUCTIONS TO THE CANDIDATE

1. *Do not write your name anywhere on the answer scripts. You have to write only your Candidate Number on every answer script.*
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 have then three hours to complete the paper.*
3. *Mark allocations are shown in brackets.*
4. *You must not start writing your answers in the answer papers until instructed to do so by the Supervisor.*
5. *Attempt all questions, beginning your answer to each question on a separate sheet.*
6. *Fasten your answer sheets together in the numerical order of the questions.*
7. *The answers are expected to be India Specific application for the syllabus and corresponding core reading. However, substantially the core reading material is still taken from material supplied by Actuarial Education Company which are meant for UK Fellowship examination. The core reading also contains some material which is India Specific, mostly the IRDA regulation. In view of this, it should be noted that focal point of answers is expected to be India Specific application. However if application specific to any other country is quoted in the answer the same should answer the question with reference to Indian environment.*
8. *In addition to this paper you should have available Actuarial Tables and your own calculator.*

Professional Conduct:

"It is brought to your notice that in accordance with provisions contained in the Professional Conduct Standards, if any candidate is found copying or involved in any other form of malpractice, during or in connection with the examination, disciplinary action will be taken against the candidate which may include expulsion or suspension from the membership of IAI."

Candidates are advised that a reasonable standard of handwriting legibility is expected by the examiners and that candidates may be penalized if undue effort is required by the examiners to interpret scripts.

AT THE END OF THE EXAMINATION
Hand in BOTH your answer script and this question paper to the supervisor Separately.

Q. 1) A new life insurer in India is planning to launch a range of guaranteed income products (immediate annuities) on its product platform. You are an independent consulting actuary and have been engaged by the Managing Director to provide a report on the risks and strategies associated with running a successful annuity portfolio. She has asked for guidance on the following issues:

1.1. Briefly describe the key types of risks associated with offering a fixed rate whole life immediate annuity (ignoring valuation mismatch risk)? (6)

1.2. Briefly outline the means of effectively hedging these risks, identifying which ones are more difficult in India (as against UK) and why. (9)

1.3. The MD is specifically interested in the role of equity exposure in the asset backing portfolio, especially given the strong growth in corporate earnings expected over the next 15-20 years.

Discuss the apparent conflict between ensuring ongoing solvency versus more effectively hedging convexity risk. What considerations might an actuary use to optimize this trade-off and describe how he/she might quantify and demonstrate the recommendation to senior management and Board? (11)

1.4. How might an investment strategy for a life company writing fixed rate whole life immediate annuity business in India differ from a UK based insurer writing similar business there, especially with reference to the UK insurer being able to access a liquid and vibrant interest rate derivatives market? (6)

1.5. The Sales Head has requested a deferred annuity product, where customers can invest on a regular basis during their working lives in a range of unit linked portfolios, and then draw-down an income for life at a pre-determined age, and a pre-determined rate of interest (expressed in Rupees per thousand of higher of guaranteed maturity value and fund value).

1.6.1. Comment on the 4 key investment exposures at play here, and the means by which you would quantify them, and the ability to hedge them (outside of the policyholder portfolios). (6)

1.6.2. What lessons have been learned in neighboring Asian markets involving negative spreads? (2)

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Q. 2) The Board of Trustees of the defined contribution pension fund of an Indian multi-national IT company's US-domiciled subsidiary has requested you, as the consulting actuary to the fund, to prepare a research report, giving them background and strategic allocation advice with respect to various topical issues relating to the current global financial turmoil. The scheme is approximately Rs 1,500 crore in size and is self-administered by the multi-national's treasury team which is having its headquarters in Mumbai.

The fund is invested 50% in the United States, 30% in Europe and 20% in India. Half the exposure is in hand-picked equities, the rest in a mix of gilts and corporate bonds and asset backed securities. The fund has significantly underperformed its benchmark (50% MSCI Global Equities, 50% JP Morgan Global Bonds) as well as the country/sectoral exposure represented in the sub-indices. The treasury team is de-motivated and under-resourced.

The issues for coverage are presented below:

The US portfolio has a significant exposure to US banks, AA rated municipal bonds and the second tier) of mortgage-backed securities at very attractive yields (with underlying exposure to sub-prime debt, but with a credit-insured AA rating).

2.1. Comment on the appropriateness of the above investment strategy, including the manner of its execution. What recommendations could be made to make this strategy more optimal for both the Trustees and the members? (10)

2.2 If the above mentioned plan were a "defined benefits scheme", briefly outline how the asset allocation strategy would differ and what type of additional information you need from the Board of Trustees. (10)

2.3 What is "sub-prime lending" in layman's terms? (1)

2.4 How and why did the banks package the exposure and sell it on to institutional investors like ourselves? What did we buy, what was the likely appeal and what are the problems in valuing it? (4)

2.5 What triggered the sub-prime "fall-out" and what are US regulators trying to do about it (including alternate views) (3)

The treasury managers have been bearish on commodities, a view which has cost the fund heavily in performance over the past year or so. And yet, in the financial media there is continuous talk of being in the midst of a commodities "super-cycle"

2.6 What is a “commodities super-cycle” and what is allegedly driving it? (1)

2.7. Do commodities as an asset class belong in the fund? What are their special characteristics and what are the considerations in deciding at what levels the fund should invest? (3)

One of treasury’s equity specialists has recently resigned, with a view to working for a prominent middle-eastern sovereign wealth fund. These funds have attracted considerable media attention and one of the Trustees has asked what these funds are and whether we can invest in them.

2.8. What are sovereign wealth funds, and how have they played a role in recent global instability in financial markets? Can we invest in them? (3)

2.9 What are the systemic risks the developed world associates with these funds? (3)

The Trustees are considering introducing emerging market exposure to the portfolio. Outside of exposure to India, they have had none to date, mainly due to their lack of relevant skill-sets in their treasury team.

2.10 What tactical and strategic considerations would be key in selecting which emerging market regions, countries and asset classes to invest in, especially in the context of current global economic and geo-political turmoil? (6)

2.11 Outline the different approaches to gaining equity exposure to the selected countries or regions. Also outline their relative advantages and disadvantages. (8)

The Trustees have suggested beginning with exposure to China. The Treasury’s investment banking adviser has suggested instead that the Fund place an allocation with a “BRIC” fund that is being launched as an offshore mutual fund by the bank’s fund management arm

The Chairman has pointed out that if they allocate to the BRIC fund they automatically increase their exposure to India. The investment bank has pitched the tactical advantage of this, especially given the significant reduction in Sensex value, and a robust domestic consumer market.

2.12. Explain the impact of sustained high oil on the strength of the Indian economy in the short term, at a time where the official current account deficit appears low and elections are imminent. (3)

Whilst the Chairman has been told Indian banks have little exposure to the sub-prime woes in the United States, he has heard rumblings of possible “carry trade” foreign exchanges derivative losses in the Indian banking and corporate sector. Given the losses in the US portfolio, notably the Trustees are nervous of taking further exposure.

2.13. Explain, giving an example, what a conventional carry-trade is and suggest how corporates could benefit from it (2)

2.14 Outline the basic structure of the foreign exchange “structured products” pitched by banks to Indian corporates (Euro, USD plays), why they are catching the analyst community by surprise, and suggest why the banks could be exposed although their positions are fully hedged with offshore counterparties. (3)

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