

Actuarial Society of India

EXAMINATIONS

15th May 2006

Subject SA6 – Investment Specialist Applications

Time allowed: Three Hours (10.15*am – 1.30 pm)

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 ASI.”

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.

Q1)

- (a) "Commitments Pvt. Ltd.," a company which has its pension portfolio derived from its defined benefit pension scheme, employs manager A to manage the equity portfolio and manager B to manage the fixed interest portfolio. The company is reviewing the investment performance for 2005 relative to benchmarks. The benchmark for manager A is the Mumbai BSE All-share Index and for manager B is the Mumbai-NSE All stocks Index. You are given the following information:

	<u>Manager A</u> (Rupees crore)	<u>Manager B</u> (Rupees crore)
Market value at:		
31 December 2004	800	300
31 December 2005	1,150	360
Contribution income less benefit outgo invested	160	40
Gross investment income	30	35

The values for the benchmarks are:

	31 December 2004	31 December 2005
Mumbai-BSF All-share Index	1,187.70	1,363.79
Gross dividend yield	5.02%	4.35%
Mumbai-NSE All Stocks Index	132.50	142.45
Ex-dividend adjustment	0.00	13.43

- (i) (a) Calculate the money-weighted return for each part of the portfolio, ignoring expenses and stating any other assumptions that you make. (8)
- (b) Comment on the performance of each manager relative to his benchmark. (8)
- (c) Discuss the limitations of these figures when assessing each manager's ability. (8)
- (ii) Calculate the overall return for the pension portfolio. (2)
- (iii) Comment on this return with reference to the median return of 19.8% for pension funds during 2005. (6)
- (b) You have been appointed as adviser to the trustees of the above-mentioned pension fund. The trustees have decided to review their investment strategy. Currently the fund invests in equities and bonds using a small in house investment management team.
- The equity portfolio is split into three areas, viz., domestic Indian equities, US equities and Japanese equities. The portfolio has a fixed benchmark, which is subject to rebalancing at the end of each calendar quarter.
- Discuss the advantages and disadvantages of the use of:
- (i) a fixed benchmark for a regional asset split (4)
- (ii) a benchmark based on regional market capitalization weights (4)
- (iii) one based on regional GDP weights (4)
- (c) One of the Trustees believes that the fund should invest more widely and has proposed that the fund invest in unquoted equities and commodities. (5)
- (i) Outline the advantages and disadvantages of investing in each of these new asset classes. (5)
- (ii) Describe how exposure might be gained to each these new asset classes and the factors the trustees should consider in comparing these alternative methods (8)
- (iii) Describe two methods that could be used in valuing an unquoted company. (4)
- (d) The pension fund regulator in India and her accounting standards body have decided to introduce a new accounting standard for companies sponsoring defined benefit pension schemes. There has been no previous practice of reporting pension scheme information on the balance sheet. The new accounting standard requires such

companies to include the surplus or deficit in the defined benefit pension scheme as a balance sheet item. In arriving at the surplus or deficit, actuaries are required to value the assets of the defined pension scheme at market value and the liabilities of the scheme using the yield on long-dated government bonds.

- (i) Discuss the implications of the new accounting standards on the balance sheet value of the sponsoring company. (6)
 - (ii) Suggest ways in which the investment policy of the defined benefit pension scheme could be altered to reduce the balance sheet volatility and outline any other implications of your suggestion. (4)
- (e) The investment Committee is considering the induction of two new fund managers and they received the following information on the performance of two fund managers and the equivalent benchmark index over a 3 year period. The annual risk free rate of return over this period is 8.5% per annum.

	<i>Manager C</i>	<i>Manager D</i>	<i>Index</i>
	% p.a.	% p.a.	% p.a.
Annual Return	14.0	15.0	13.0
Standard Deviation	16.78	23.63	12.21
Correlation Coefficient with Index	0.75	0.36	1.00

- (i) Calculate four different risk adjusted performance measures for each fund manager.
 - (ii) Comment on the result from (i) stating any limitations that apply to them. (10)
- (5)
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Q2) You are a consultant to a large investment fund that currently has Rs.100 crore invested in US equities. As a result of a recent asset allocation meeting, the decision has been taken to invest a further Rs.300 crore in US equities by selling the corresponding amount of Indian equities. The asset allocation team has emphasized the need for the switch to go ahead as soon as possible.

- (i) Describe the practical problems of carrying out such a switch without the use of derivatives. (4)
- (ii) Explain how this switching process can be made easier by the use of derivatives. (4)

You decide to buy US equity exposure by buying the S&P 500 June futures contract. You know that you have sufficient cash to cover the margin position. The unit of trading is Rs.500 per index point and you have been quoted a price of 1,000 for the June contract.

- (iii) Calculate the number of contracts you would need to buy to gain the required US equity exposure. (2)

Prior to this new US equity investment, the fund had no holdings in the technology sector. Assume that technology stocks constitute 30% of the S&P 500 index.

- (iv) Calculate the exposure of the fund to technology after the purchase of the futures. (2)
- (v) Discuss briefly methods by which you might attempt to eliminate the technology weighting. (5)

The managers of the fund are bullish on US stocks, but they are worried about the level of the dollar, which they think may depreciate in the short term against Indian rupee. As a result they would like only one half of the fund exposed to the dollar.

- (vi) Explain how you might achieve this reduced exposure and also mention the problems that would have to be overcome. (4)

- (vii) Describe different types of order that a trader in LIFFE derivative market can use to trade in the derivatives market. (3)
- (viii) A traded option screen for the shares of Moonlight Ltd., shows the following prices:

Strike price	March Put	June Put	March Call	June Call
400	25-27	35-37	34-36	46-47
450	54-56	64-66	10-11	30-21

The current price of the share is around Rs. 410.

- Explain in words how you would construct a calendar spread using calls, and state the prices you would deal at given the table of information above. (2)
- Explain how you would construct a strap using March expiry calls and puts with strike price Rs.400 and draw a diagram that shows the payoff from such a position at the expiry of the options. (4)

[30]
