Actuarial Society of India

EXAMINATIONS

22nd June 2005

Subject ST5 – Finance and Investment A

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

INSTRUCTIONS TO THE CANDIDATE

1. ***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.***

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

3. ***The answers are not expected to be any country or jurisdiction specific. However, if examples/illustrations are required for any answer, the country or jurisdiction from which they are drawn should be mentioned.***

4. ***Mark allocations are shown in brackets.***

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

6. ***Fasten your answer sheets together in numerical order of questions. This, you may complete immediately after expiry of the examination time.***

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."

AT THE END OF THE EXAMINATION

Hand in BOTH your answer script and this question paper to the supervisor.

Q.1 **a)** Why may governments consider it necessary to regulate company mergers? **(3)**

b) What is meant by the term conglomerate merger? **(1)**

c) Explain why two different companies might undertake a conglomerate merger. **(6)**

Total [10]

Q.2 **a)** Describe briefly the main forms of private equity. (2) **(2)**

b) A pharmaceutical company with significant R&D (research and development) has approached a venture capital firm for finance. Explain why venture capital may be an appropriate means of finance for this company. **(4)**

Total [6]

Q.3 **a)** Describe briefly the three types of credit derivatives. (5) **(5)**

b) Give examples of situations when each of these could be appropriate means for managing credit risk. **(3)**

Total [8]

Q.4 A call with a strike price of Rs. 60 costs Rs. 6. A put with the same strike price and expiration date costs Rs. 4. Construct a table that shows the profit from a straddle. For what range of stock prices would the straddle lead to a loss? **(5)**

Total [5]

Q.5 **a)** Explain what is meant by "interest rate cap". **(2)**

b) Consider a contract for a principal of Rs. 10 mn with a cap rate of 4% p.a. (with quarterly compounding) for three months starting in one year. The forward interest rate for a three-month period starting in one year is 3.75% p.a. (with quarterly compounding). The current 15-month interest rate is 3.25% p.a. (with continuous compounding). The volatility for the forward three month rate underlying the caplet is 20% p.a. Calculate the caplet price. **(7)**

Total [9]

Q.6 **a)** A life insurance company writes predominantly unit linked products. Some of these products offer investment guarantees. The Investment Committee of the company is meeting to review the investment policy. One of the members has suggested the following investment restrictions: **(7)**

i) No investments in companies involved in manufacturing or distribution of tobacco products or alcoholic beverages.

ii) Avoid frequent churning of stocks in its equity portfolio.

iii) Restrictions in holding of derivatives.

Explain the merits and demerits of these restrictions.

b) The Committee is concerned about the volatility and uncertainty underlying the assets and liabilities as the main unit linked products carry investment guarantees. You have been asked to explain the key characteristics of stochastic asset liability modeling and any drawbacks with this approach. **(6)**

Total [13]

Q.7 A large life insurance company monitors the performance of its investment managers quarterly against a specific benchmark fund. You are an independent investment consultant to the fund and during a recent Board meeting the CEO queries the performance record of two of his investment managers. The following data is presented to you.

Amounts in Rs Crores

	31/12/03	31/03/04	30/06/04	30/09/04	31/12/04
Manager A	75	84.75	82.5	92.25	98.25
Manager B	75	84	75	97.5	99
Quarterly benchmark performance (%)		10	(5)	10	5

In addition you are told that Manager A received a steady cash flow stream at the rate of Rs1.5crore per quarter. Manager B received Rs 12crore exactly in the middle of the year and was asked to pay out Rs 3 crore at the end of the each of 1st and 3rd quarters.

The CEO asks you to assess and compare the performance of each of the two managers and explain why A has underperformed B.

(a) Explain the purpose of performance measurement and discuss the various methods that can be used. **(8)**

(b) Using the information given above calculate the basic (non risk-adjusted) performance of each manager over the course of the year. State clearly any assumptions you have made. **(8)**

(c) Comment on the results of your analysis. **(6)**

(d) Explain how risk adjusted performance measures may further help analyse the relative performance of the two managers. **(2)**

Total [24]

Q.8 In the context of the active management of a portfolio of Government Bonds,

(a) Define policy switching and give an example of a policy switch. **(3)**

(b) Describe the techniques for identifying policy switches. **(8)**

(c) The following data is available:

Bond	Coupon Rate	Term to Maturity	Interest Yield	GRY	Clean Price
A	8.5%	10 years	7.52%	6.65%	112.96875
B	8.5%	3 years	8.28%	7.13%	102.6875

You are a holder of bond A. A stockbroker suggests that as an alternative to holding bond A to maturity you:

1. sell bond A,

2. reinvest the proceeds in bond B until it matures in three years time and then

3. invest the proceeds of your holding in bond B in bond A until its maturity.

Analyse the stockbroker's suggestion. Ignore tax, and list any assumptions that you make. **(4)**

Total [15]

Q.9 Company A and company B are offered the fixed rates of interest in US dollar and sterling shown in the table below.

Company	*US$ interest*	*Sterling interest*
rate p.a.	*rate p.a.*	
A	7.0%	10.5%
B	9.0%	11.0%

Company A wants to borrow in sterling and company B wants to borrow an equivalent sum in US dollars.

a) Explain how a bank could arrange a currency swap that will benefit both companies and make a margin for itself. **(5)**

b) Explain what risks the bank would face in such an arrangement and how it could minimise these risks. **(5)**

Total [10]

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