Actuarial Society of India

EXAMINATION

23rd May 2007

Subject ST5 — Finance and Investment A

Time allowed: Three hours (9.45* pm – 13.00 pm)

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of your answer sheet.*

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 then have three hours to complete the paper.*

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

5. *Mark allocations are shown in brackets.*

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

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

8. *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.

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

Please return your answersheets and this question paper to the supervisor seperatly.

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator.

Q.1)

(a) Describe the main principles underlying the imputation system of corporate taxation (3)

(b) State with reasons which corporation tax system [s]

i) might be expected to encourage dividend payments

ii) might be expected to encourage companies to diversify

iii) might be expected to be favored by tax-exempt investors (5)

[8]

Q.2) Three investors A, B and C are bullish on the prospects of an equity stock of a manufacturing company, as it has bagged large export orders. Currently the stock is quoting at Rs.500 per share. Each one of them wishes to invest Rs.5, 00,000 in the equity stock of this company. There is a 3-month European call option on the stock with an exercise price of Rs.500 trading at a premium of Rs.50.

Investor A buys 1000 shares in the market. Investor B buys 1000 call options and invests the balance in a risk free bond carrying an interest rate of 9% p.a compounded quarterly. Investor C invests the entire amount to buy the call options on these stocks.

(a) Briefly describe the investment strategies followed by these three investors (3)

(b) Calculate the investment returns earned by these three investors at the end of the three month period [expiration period of the call option] assuming that the share price on the date of expiry of the option was (i) Rs.650 (ii) Rs.450. Comment on your results. (4)

[7]

Q.3) A domestic airline company PET Airways wants to buy new aircrafts from Boring Inc. that cost US$500 million over a3 year period. The current exchange rate is Rs.40 per US$. The company has approached a multinational bank, A which has its operations in India for the loan that is guaranteed by another US based bank B. Bank A has advised the company to securitize the future cash flows arising from ticket sales from the airline operations to raise the money from the Indian Institutional Investors for the purchase of the aircrafts. The cash flows from the ticket sales which are expected to be at least 1.25 times the repayment amounts are deposited in an escrow account opened with Bank A for making the payments to the investors. Accordingly the company floated a Special Purpose Vehicle for issuing the bonds that are subscribed by the Indian Institutional Investors in Indian Rupees and are to be redeemed in 10 years. The investors are paid a floating interest rate, which is 1% over the prevailing interest rate on a 10-year government bond. The payments to the Investors are guaranteed by Bank A on the strength of the guarantee it has from Bank B .The money thus raised from the investors is deposited with Bank A which in turn made the payment to the Boring Inc. The aircrafts are registered in the name a subsidiary of Pet Airways Ltd., in Mackey Islands that has very liberal civil laws. The aircrafts are hypothecated to Bank B in Mackey Islands where the local laws facilitate immediate takeover of aircrafts in case of a default.

(a) Define the terms i) Securitization

ii) Special Purpose Vehicle (3)

(b) Using a schematic diagram, show the structure of the securitization transaction described above. (4)

(c) Define the term “Credit Default Swap (2)

(d) In the above securitization transaction, is Bank B exposed to default risk? If so, can Bank B use credit default swap to eliminate its default risk exposure? (3)

[12]

Q.4) The 1 year and 4- year continuously compounded spot rates are currently 6% and 6.75% p.a. respectively. A 1-year European put bond option with a strike price of 83% is available on a 4-year zero-coupon bond. An option dealer is quoting a forward yield volatility for the bond option at 20% pa. Calculate the forward price volatility of the zero-coupon bond and hence calculate the price of the put option on the bond. State assumptions, if any. **[8]**

Q.5) A developing country has a rapidly expanding financial services sector. This country is contemplating introduction of a suitable legislation to regulate the financial markets. In this context briefly discuss the costs and benefits of regulating the financial markets. **[8]**

Q.6) A life insurance company has recently appointed a new Managing Director after finding that the company has not made profits after being in the operations for 10 years. The Managing Director’s mandate has been to expand the sales and gain market share over the next 3 years. His bonuses and remuneration have been accordingly linked to achieving these sales targets.

(a) Define the term “Agency Costs” and briefly explain why such costs arise? (3)

(b) Explain with the help of Agency Theory, how the interests of the Managing Director can conflict with that of the shareholders? How should the incentive plan for the Managing Director be modified so that the shareholders’ interests are protected? (3)

[6]

Q.7) You are an independent investment consultant. A client is considering making a portfolio allocation to one or more hedge fund managers and has asked you to carry out a manager selection exercise to assist in determining which managers should be appointed.

You are planning to request performance statistics from a range of established hedge fund managers and carrying out a comparative analysis of their past performance.

(i) Outline the data you would request for this exercise and the calculations you would make with this data (4)

(ii) Explain why this analysis may not provide a sufficient picture to choose appropriate managers (8)

(iii) List the additional information you would request in order to address any shortcomings in the analysis conducted in item (i) (4)

[16]

Q.8) An investment bank is pricing a 15-year swap using its internal cost of capital of 8% per annum. In return for a swap premium, the bank will pay its client the excess interest payable on a variable rate loan of LIBOR + 100 bps above a fixed rate loan of 5.5% (the client will pay the bank in the event of the fixed rate loan giving rise to higher payments than the variable rate loan). These payments are made at the end of each quarter. The capital payment under the client's loan is not covered by the swap arrangement.

(a) Assume LIBOR is initially 4% and remains at this level for the first 7 years of the term, and is 6% thereafter. Calculate the present value of the cash flows covered by the swap based on a principal sum of £10 million. (6)

(b) Explain why in practice the bank will charge more than the present value calculated in (i) above (5)

[11]

Q.9)

(i) Describe the operation of a futures margining system of a clearing house and explain why it limits credit risk on exchange traded futures contracts. (8)

(ii) Describe how an institutional investor could use equity index futures in protecting their UK equity portfolio (4)

[12]

Q.10)

(a) Outline the limitations of a deterministic investment model when testing the suitability of a given asset distribution (4)

(b) The following data are available about the total returns for a fund and the relevant indices over a three-year period:

	Year 1		**Year 2**		**Year 3**	
	Index	Fund	Index	Fund	Index	Fund
Equities	31%	35%	(-)2%	2%	24%	26%
Fixed Interest Bonds	14%	13%	17%	14%	1%	2%
Index Linked Bonds	11%	12%	17%	16%	7%	7%

The fund's strategic benchmark was set at the start of year 1 as 60% equities,20% fixed interest bonds and 20% index linked bonds. It was not rebalanced thereafter. The fund manager adopted a strategy of 50% equities,40% fixed interest bonds and 10% index linked bonds at the start of year 1 and did not rebalance thereafter.

Required:

i) Calculate the total return on the fund and the strategic benchmark over the three-year period and state the relative performance (3)

ii) Estimate how much of the fund's relative performance is attributable to stock selection and how much is attributable to asset allocation. Briefly comment on your results (5)

For the purpose of the above calculations, ignore the fund's cash flows. State other assumptions, if any. **[12]**

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