Actuarial Society of India

EXAMINATIONS

09th November 2006

Subject CA11 – Assets

Time allowed: Three Hours (10.15* - 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."

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.

Q.1)

(a) You are the investment adviser to Ever Smile Life Insurance Company, which is having about Rs. 2000 crore assets as on March 31, 2006. The board is actively considering diversification of its equity portfolio. One director mentioned that it is sometimes difficult to compare the possible investment of shares of companies, which operate in different industries. Draft a brief reply explaining the reasons behind this statement. (6)

(b) Government of India bond A, 6.5 % July 2015 is a conventional bond and other Government of India bond B is Aug 2020 which offers wholesale price inflation plus 2 per cent. Briefly explain the factors that determine the size of the difference between the yields that they offer. (3)

(c) When you compare the yields between equities and index-linked bonds, what factors will be reflected in this risk premium? (2)

[11]

Q.2)

(a) In the context of developing an asset liability model, describe the different approaches that may be used to facilitate testing and parameterization of an asset model at the implementation stage of its development. (5)

(b) Using stochastic asset models, describe different ways in which equity returns and conventional bond yields are projected. (5)

[10]

Q.3)

(a) You are appointed as a bond portfolio manager of a life insurance company. Explain briefly the various risks you would monitor. (4)

(b) You are an investment consultant to a company. In the last three years the company has borrowed heavily in the market to support its activities and plans to grow through acquisition of a software company. Because of recession in the market the company is struggling to cover debt repayments and it also needs additional money to complete the research activities of the acquired software company.

You have approached a bank with a proposal to swap its loan to the company for equity. Outline the factors that will affect the bank's preference for debt or equity investment in the company stating any further information you would require in order to make a decision on the proposal. (6)

[10]

Q.4)

(a) You are an investment advisor to a pension fund. From actuarial and practical view points, explain why you would like to value the assets by reference to the proceeds expected to emerge from a notional portfolio. (6)

(b) Discuss the extent to which matching of liabilities affects the choice of individual stocks within each of the following asset categories:

i. conventional government bonds
ii. other domestic fixed interest securities
iii. overseas equities
iv. domestic property (6)

[12]

Q.5) The following are the cash outflows:

Rs. 4.25 crore in one year's time
Rs. 4.95 crore in two years' time
Rs. 5.75 crore in three years' time

The following Government of India annual coupon fixed interest securities are available:

Name of the security	Coupon rate	Number of year until redemption	Market price (Rs.,)
A	10 %	1	103.774
B	5%	2	97.293
C	15%	3	120.826

(a) Determine the nominal amount of each stock that the institution must purchase in order to exactly match its liability outgo. (3)

(b) By calculating the forward rate term structure of interest rates, determine the present value, at market rates of interest, of the liability payment due in three years' time (4)

[7]

Q.6)

(i) Define net asset value per share for a property company. (1)

(ii) Explain why property shares may not be priced at their net asset value. (3)

[4]

Q.7) You work in the investment team of a financial services group, comprising of a bank and a life-insurance company. The bank specializes in providing repayment home loans for individuals. The life insurer specializes in providing bulk purchase annuities. A bulk purchase annuity is where an insurer for a single payment from the trustees of a scheme undertakes to pay all the immediate and deferred annuities of the scheme as they fall due.

(i) Describe the cash flows of a repayment loan and a bulk purchase annuity. (6)

(ii) Explain how the loans and bulk purchase annuities can be used to match each other's cash flows. (2)

(iii) Outline the potential risks involved in using the two products to match each other. (3)

[11]

Q.8) List the characteristics of well run projects. **[6]**

Q.9) Explain why some government bonds persistently stand either above or below the yield curve. **[3]**

Q.10) On a particular share you write a European call option at the money with a contract date in 6 months time. The premium of the call is 15% of the exercise price.

(i) Explain both in words and using a diagram the relationship between any profit (or loss) that you make and the share price. (Ignore interest on the premium.) (6)

(ii) Outline what the relative premium of an identical American call option would be. (2)

[8]

Q.11)

(i) Define risk and describe how you would incorporate risk into a model to evaluate a capital project. (2)

The Indian and Sri Lankan governments have initiated a project to assess the viability of a toll bridge linking the two countries. You have been asked to conduct a risk analysis of the project.

(ii) Describe the steps which you would take to identify the risks facing this project. Include three examples specific to the toll bridge in your answer. (5)

(iii) List four methods of mitigating the risk in a capital project. For each of the four methods listed, include an example of a risk which is specific to this project and which could be mitigated in this way. (5)

[12]

Q.12)

(i) By considering the cash flows on a bond derive the internal rate of return on a 12% coupon bond, redeemable at par in exactly 20 years time, purchased at Rs. 128 per Rs. 100 nominal. Assume coupons are paid semi-annually. (4)

(ii) Calculate the real internal rate of return if average inflation over the 20 years is 7%. (2)

[6]

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