INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

3rd November 2008

Subject SA5 – Finance

Time allowed: Three hours (9.45* - 13.00 Hours)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATES

1. Please read the instructions on the front page of answer booklet and instructions to examinees sent along with hall ticket carefully and follow without exception

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

4. 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.

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

6. Mark allocations are shown in brackets.

AT THE END OF THE EXAMINATION

Please return your answer book and this question paper to the supervisor separately.

Q 1) You are the Chief Financial Officer (CFO) of a large life insurance company which writes both linked and non linked business. Your current priorities are to develop appropriate structures & processes for managing the investments and the capital of the company.

a) As the first step, you want to articulate an appropriate investment strategy for the company.
Discuss the features of the liabilities that need to be taken into account for determining an appropriate investment strategy. (8)

b) One of the products sold by your company is non-linked retirement annuities. The current in force portfolio of this product is backed by a fixed interest fund. You want the investment manager of this fund to increase the total return on this fund. Discuss the various strategies which the investment manager can use to enhance the return. (7)

c) A key shareholder of your company is a global life insurance company. Keeping in line with the trends in the developed markets, this shareholder wants you to estimate the appropriate risk based capital for your company using the VaR Methodology. You have been advised to read the Basel II Accord and Solvency II directives to understand the overall context.

i. Discuss the limitations of the Basell II approach for estimating risk based capital? (5)

ii. Briefly explain the three pillar approach underlying the Solvency II directives (3)

iii. The local insurance regulator wants you to determine solvency capital using a two factor approach – the factors being linked to the mathematical reserves and sum at risk.
Outline the major limitations of estimating solvency capital using this approach (3)

iv. Briefly discuss the key issues you need to address while implementing the VaR methodology for estimating risk- based capital (7)

d) About 20% of the investments of the company are in residential mortgages. The company's board wants you to securitize a part of this residential mortgage portfolio.

i. Describe how mortgage backed securities (MBS) are typically structured (4)

ii. Explain the main risks which will concern investors while buying these securities. (6)

iii. Discuss a methodology for valuing mortgage backed securities where borrowers are expected to prepay their mortgage when refinancing rates fall below the loan interest rate (10)

e) Assume that the company has issued 10 year mortgage backed securities (MBS). The MBS offers a 9% annual coupon and has a credit spread of 0.75% pa over the 6.75% pa gross redemption yield offered by an otherwise identical Government Bond.

An investor who has invested in the MBS is concerned about the default risk inherent in the MBS. So, he buys a credit default swap (CDS) from a bank.

Calculate the cost of the credit default swap; and comment on your answer. State assumptions, if any (5)

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Q 2) Alfa Motors is a leading manufacturer of commercial vehicles. The company has added substantial capacity expansion in the last five years and has been funding its organic growth initiatives through debt finance. The current debt equity ratio of the company is 3:1.

Recently the company has decided to enter the low- end passenger cars segment. This project requires a capital outlay of Rs. 300 crores and will be funded through a mix of debt and equity in the ratio of 4:1.

a) The Managing Director of the company wants you to evaluate the capital structure of the company from a risk - reward standpoint. In particular he wants to understand the risks of the capital structure can get accentuated by a short-term liquidity crunch.
Draft an appropriate report (10 marks including 2 marks for drafting) (10)

b) The CFO of the company believes that the financial risk associated with the capital structure need not be hedged. His belief is predicated on the MM (Modigliani and Miller) proposition which states that the market value of any firm is independent of its capital structure.
State, giving reasons, whether or not you agree with the views of the CFO. (5)

c) The company plans to finance 20% of the proposed project outlay through a five year non cancellable financial lease. The prevailing annual lease rate for a five year financial lease is Rs. 300 per Rs. 1000. The lease rentals are payable in advance (i.e., at the beginning of each year).
The tax relevant rate of depreciation on the equipments (covered under the finance lease) is 25% based on the written down value method. The net salvage value of the equipments after 5 years is expected to be 10% of its original cost. The marginal post tax cost of debt is 8% and the marginal tax rate is 30%

i. Evaluate the alternatives of leasing versus borrowing using the net present value criterion and recommend an appropriate alternative (Show all calculations and state assumptions, if any) (6)

ii. The CFO of the company wants to choose the financial lease option regardless of your recommendation. He argues that leasing is advantageous because it is an off -balance sheet source of finance and it helps to preserve the debt capacity of the company.

Evaluate the arguments of the CFO (3)

d) The company proposes to issue callable bonds as part of the proposed debt finance for the project.

i. Outline the circumstances under which the company will exercise the call option and suggest restrictive covenants that need to be in place for protecting the investors. (6)

ii. Which will have a higher yield to maturity - a non callable bond or a callable bond of identical maturity and coupon? Under what circumstances, will this yield difference be maximum? (3)

e) The company also plans to issue non-callable bonds as part of the proposed debt finance. These bonds have been rated as "Investment Grade (A+)" by two independent rating agencies.

An institutional investor contemplating investment in these bonds wants to use the default - based approach for evaluating the price of these bonds.
The investor is particularly concerned about future changes in credit ratings and wants to consider such changes in the evaluation of these bonds

i. Define the equations underlying the default based approach assuming full default (4)

ii. Explain how this approach can be extended to include changes in credit ratings rather than full default. (5)

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