# INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

## 26th November, 2012

## Subject SA5 – Finance

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

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.***

7. ***Please check if you have received complete Question Paper and no page is missing. If so, kindly get new set of Question Paper from the Invigilator.***

| AT THE END OF THE EXAMINATION |
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| **Please return your answer book and this question paper to the supervisor separately.** |

**Q.1)** Bhartiya Bank Ltd. (BB) is a large bank headquartered in Bangalore, India, and operates in India as well five other countries around the world. To finance its operations, BB has been issuing equity and debt denominated in INR. BB recently raised capital by a six-month U.S. dollar-denominated floating loan. The loan represents 2 percent of BB's total debt.

BB holds an investment portfolio designed to hedge its risks related to foreign exchange fluctuations. The portfolio is composed of structured equity and credit products, over-the-counter (OTC) currency forwards, swaps, and options.

[i] The BB Board has hired you as a consultant to identify risks that need to be measured and managed. Your report explicitly specifies that BB is exposed to liquidity and settlement risks, among other risks.

[a] **Describe** how BB is exposed to liquidity and settlement risks. A single source may not be used for both liquidity and settlement risk**.** (4)

[b] **Describe** four other risks BB is likely to be exposed to, in addition to liquidity and settlement risks (6)

[ii] BB has been using Value at Risk (VaR) techniques for measuring the key risk exposures in its investment portfolio.

[a] **Explain** how stylized scenarios- based stress testing method can be used to supplement VaR. **Substantiate** your answer using the likely risk scenarios for key risk factors (at least three factors) and interrelationship between them. For interrelationship, you may assume linear dependency. (6)

[b] A member of the BB Board remains concerned that stylized scenario analysis supplemented VaR has not adequately considered the risks to BB's investment portfolio. **Recommend** four other stress testing methods, in addition to stylized scenarios, to effectively supplement VaR. **Explain** one advantage for each of these methods. (4)

[iii] BB is evaluating the possible purchase of an MBS in the fixed-income portfolio in the US, in the backdrop of likely rising LIBOR rates over the next 12 months. As a Fixed Income expert, you have been requested recommend which one of the following investments is more appropriate: MBS- collateralized mortgage obligation (CMO) tranches or MBS-based pass through securities. **Describe** with appropriate reasons, the type of security should BB invest in? Also **suggest the appropriate risk measure and an approach for valuing the selected security** (7)

[iv] As Chief Risk Officer (CRO), BB board has asked you to devise a strategy to hedge the risk due to changing interest rate on the floating loan. You are considering two contracts: a Eurodollar futures contract, with six months to maturity, selling at 5%, settled on three month LIBOR, marked-to-market every day; and a Eurodollar forward contract, with six months to maturity, selling at 5%, settled on three month LIBOR at maturity. **Explain** your hedging strategy, including the reason for the security you intend to use between the Eurodollar futures contract and the Eurodollar forward contract? (5)

[v] **Explain with examples,** three possible ways for minimizing losses in case of default by the counterparty in an OTC market transaction? (6)

**[38]**

**Q.2)** Vega Life is a large life insurance Company promoted by Zeta Capital, a leading financial conglomerate. The other large company of this conglomerate is Gamma Finance, which is predominantly engaged in asset based financing – equipment leasing, hire purchase and factoring.

Zeta Capital is currently involved in designing and implementing an economic capital model for all its group companies. As the CRO [Chief Risk Officer] of Vega Life, you have been asked to develop an economic capital model appropriate to the requirements of a life insurance company. You are in the process of developing a project plan which covers all stages of the economic capital modelling [ECM] process.

[i] Briefly describe the key stages of the ECM process. (10)

[ii] State the uses of economic capital from the stand point of Vega Life (2)

[iii] The CFO [Chief Financial Officer] of Zeta Capital has suggested that all the group companies must use economic capital as the primary tool of risk mitigation. The CEO [Chief Executive Officer] of Vega Life wants you to prepare a response highlighting the drawbacks of this suggestion. Discuss the main points you will set out in your response (5)

- The CEO of Vega Life wants you to take this opportunity to review the methodologies used for measuring insurance risks, credit risk and operational risk.

While reviewing the methodology for measuring credit risk, you find that a structural (firm based) approach is currently used for quantifying credit risk. One of your team members has suggested that this approach can be replaced by reduced form models [credit migration approach]

[iv] Evaluate the relative merits and demerits of this suggestion (7)

- You are also concerned about the current approach being used for quantifying operational risk, which is based on subjective judgement.

[v] Define operational risk (1)

[vi] Explain why Vega Life may find it difficult to assess its operational risk exposures? (2)

[vii] Outline an approach you would use for calculating the operational risk capital for Vega Life. Evaluate your approach vis-a-vis other commonly used approaches for estimating operational risk capital (6)

- One of the directors on the Board of Zeta Capital has suggested that Zeta Capital must acquire a bank to have a complete product range

Zeta Capital is keen on acquiring a small regional bank which has been distributing the products of Vega Life

You are a part of the "Due-Diligence" team setup by Zeta Capital to evaluate the acquisition and make an appropriate recommendation.

At the outset you are concerned about the quantity and quality of information available from the published financial statements and other public disclosures made by the bank.

[viii] Describe in detail the information you would require for assessing the bank's financial position and for assessing capital adequacy as per the requirements of Basel I and Basel II (12)

- Based on the due-diligence study and other evaluations, assume that Zeta Capital has decided to acquire the regional bank.

It has also been decided that the bank will be acquired by Gamma Finance. The acquisition will be financed by securitising the future rentals arising from equipment lease portfolio of Gamma Finance. This portfolio comprises of financial leases written with non-cancellable periods ranging from three to eight years.

[ix] Describe how you will structure the securitised bond issue. (5)

[x] Evaluate this mode of finance from the stand point of Gamma Finance. Suggest appropriate solutions for overcoming the drawbacks identified by you. (12)

**[62]**

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