INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

16th September 2016

Subject ST5 - Finance and Investment A

Time allowed: Three hours (14.45* – 18.00 Hrs.)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATES

1. ***Please read the instructions inside the cover 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 you are required 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 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.***
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
Please return your answer book and this question paper to the supervisor separately.

Q. 1) **i)** Define the terms

a) Classical tax system (2)

b) Imputation tax system (2)

ii) Discuss 'bed and breakfasting' in taxation. (3)
[7]

Q. 2) **i)** List principal aims of regulations. (2)

ii) Briefly describe possible forms of regulation (2)

iii) Briefly describe main types of regulatory regimes for financial services firms (2)
[6]

Q. 3) Consider a 3-year bond with yearly coupons. The 12-month, 24-month, and 36-month zero rates are 8%, 7% and 6% respectively.

i) Calculate the par yield of the above bond. (2)

The current price of a 7-year Eurodollar future on a 3-month interest rate is 92 and the standard deviation of the change in the short-term interest rate is 1.2% per annum.

ii) Calculate the forward and futures rate. (3)

iii) Comment on results of question (ii). (5)

An investor has just written a call option on a stock currently trading at Rs 99 for a strike price of Rs 100. The risk free rate is 6%, the time to maturity is six months and the volatility is 20% per annum.

iv) Calculate the amount required to delta hedge 1000 such options at the start of investment. (4)

v) The stock price increases to Rs 99.39 on the next day. Calculate the additional amount required to delta hedge this investment (3)
[17]

Q. 4) **i)** Define the term Value at Risk. (1)

ii) Briefly discuss four shortcomings of Value at Risk and likely reasons for deviations from actual movement in market values. (2)

iii) Suggest financial stress tests that can be carried out by a Pension Fund. (4)

iv) Discuss how the two measures, viz. Value and risk and stress testing, differ and the advantages and disadvantages of both. (3)
[10]

Q. 5) XYZ, a large life insurance company, has significant investment in Equities, Government & Corporate bonds and Property. A new intern in the investment department has suggested the Chief Investment Officer (CIO) to buy credit default swap to hedge the credit risk associated with the corporate bond.

i) Discuss the suggestion. (4)

The CIO has asked the intern to draft a report on the use of multifactor model in portfolio management.

ii) Describe the points to be included by the intern in her report. (11)

The head of the product has proposed to allow policy loan as a feature under its participating saving products, wherein the policyholder can take loan from the Company against his/her policy.

iii) Evaluate the proposal. (6)

[21]

Q. 6) Recently one Indian lending institution came out with an inflation linked bonds issue, which received a hugely positive response and was over-subscribed almost 4 times.

i) What are inflation linked bonds? How is the real yield of such instruments determined when compared to normal notional bonds? (3)

ii) What could be the potential reasons for this huge response? (3)

Assets are purchased based on the risk return profiles and characteristics of liabilities. Your Appointed Actuary has asked you to prepare for a detailed discussion with the senior management next week. Explore existing cash-flows and specific new product categories that could benefit from this asset class (inflation linked bonds).

iii) Put together a discussion framework along with relevant rationale for each product category and cash-flows suggested. (6)

[12]

Q. 7) A large life insurance company in a developing nation with low life insurance penetration has been in operation for 10 years. The government has taken many steps to increase the insurance penetration. The company has written a range of successful participating and non-participating business. The business comprises of term insurance, unit-linked insurance, traditional participating & non-participating endowment assurances and immediate annuity. The Company sells these products through multiple distribution channels. It has recently launched couple of products on online channel. The Company has been making increasing profit for last 4 years but has never paid dividend. The shareholders of the Company are contemplating to go for an Initial Public Offer.

i) You are a fundamental share analyst at an investment bank. The life insurance company has approached you for your view on the market price its share can get. Discuss the factors that affect the relative market price of a share, drawing specific correlation with the contextual information provided above, wherever applicable. (13)

ii) List the potential sources of information, which you as a fundamental share analyst, will investigate in order to form a view on the above. (2)

[15]

Q. 8) You caught up with your Chartered Accountant friend after a long time at your recent school reunion. She is working as a senior Fast Moving Consumer Goods (FMCG) analyst with a big brokerage house, but unaware of insurance valuation. Given the long term and capital intensive nature of life insurance business, it would be difficult to measure profitability on a cost of goods sold and profit markup framework that is typically used in FMCG valuations.

She is curious to understand the valuation of an insurance company with reference to the following:

i) How a dividend discount model could be used to determine the market cap of a life insurance company? (7)

ii) What would be the most critical assumptions while estimating the market cap of a life insurance company? And why? (2)

iii) What operating efficiency ratios would be critical for a life insurance company? (Hint: Any correlation with the FMCG industry will be easier for her to correlate and understand.) (3)

[12]

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