INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

27th May, 2013

Subject SA6 – Investment

Time allowed: Three hours (14.45* - 18.00 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 Candidate 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
Please return your answer book and this question paper to the supervisor separately.

Q. 1) You work for a Life Insurance company which specializes in traditional products which are primarily savings led insurance. The products are offered both on traditional and non-traditional platform. The company is finding it difficult to compete on guarantees since most other companies in India have started shifting their focus to similar products and many of them have enhanced their guarantees to make the products more competitive. You're under pressure to give guarantees to the tune of 6-7% pa on most of the products wherein the policy term is 25-30 years or above. The current interest rates are around 8% pa but the top management team feels that there are various risks on the interest rate side.

i) As an investment actuary what are the risks which you envisage for the company and why? (4)

ii) Amongst the many options discussed to hedge the risks, the recurring deposits offered by banks was considered in detail. Explain why it seems to be a possible choice for the insurance company. What are the other instruments available in India which should be considered in the portfolio to hedge against the liabilities of the above mentioned insurance company (3)

iii) The company has invested in a high yielding corporate bond but the bond has a callable option. An analyst in your team has calculated three duration measures of the callable bond – Modified Duration, Effective Duration and Macaulay Duration

a) Explain what is a callable option and how it works (1)

b) Please explain the difference between Modified duration, Effective duration and Macaulay duration for a callable bond (3)

c) Why is Effective duration a better measure of duration for callable bonds (2)

d) Explain whether callable bonds have a negative or positive convexity (1)

e) What are the risks on investments made in a callable bond? (1)

f) Are these investment risks dependent on the size of the coupons received every year? Explain (1)

iv) The company has invested in one of the longest term government security (g-sec) which gives an yield of 8% pa and pays coupon at the rate of 9% pa on a face value of 1000. The remaining term to maturity of bonds is 28 years.

a) Calculate the price of the g-sec (2)

b) What are the risks due to parallel shift in the yield curve? (1)

c) If there is a 150 basis points parallel shift in the yield curve, then calculate the new price of the g-sec (find the price in either direction of the shift i.e. both upwards and downwards) (3)

d) If the above g-sec has a callable option at Rs 1200, then calculate the effective duration of the bond (2)

e) What are the risks due to non-parallel shifts in the yield curve? (1)

v) You have a technical analyst in your team who tracks lot of indicators and he mentions to you that the slope of the yield curve gives a reasonable indication about the trends in the stock market. If the yield curve is downward sloping ,then explain what trend (bullish or bearish) in the market can be predicted from the same and why? (3)

vi) Insurance companies are not allowed to use equity derivatives in India but your team still tracks some of the major indicators. One such indicator is Put/Call ratio. Explain what direction of market (bearish or bullish) does a high Put/Call ratio indicates. (2)

vii) Evaluate the following products from Investment risk point of view and please state whether the products are very risky or less risky and why.

Finally rank the products from most risky to least risky keeping the investment risk into your perspective.

a) Regular Premium Non-Par Whole life Assurance product

b) Regular Premium Par Endowment Assurance for 20 years with higher surrender options

c) Regular Premium Term Insurance for 25 years

d) One year Renewable Group Term Insurance product

e) Single Premium Endowment Assurance for 20 years

f) Regular premium Par Endowment Assurance for 20 years with lower surrender options

g) Regular Premium Non-Par Endowment Assurance for 20 years with higher surrender options

h) Unit Linked Endowment Assurance for 20 years with no guarantees

i) Single Premium Whole life Annuity (Non-Par platform)

j) Single Premium Annuity with Return of Premium on Death (Non-Par platform)

(14)

viii) The new Investment Regulations of IRDA makes a reference to "Fund beyond Solvency".

a) Explain what is Fund beyond Solvency. (1)

b) What are the pros and cons of regulating fund beyond solvency? In your view should the Fund beyond Solvency be regulated? (5)

c) Briefly discuss whether the new regulations allow enough investment freedom for fund beyond solvency or not. (2)

[52]

Q. 2) You have been hired as a Chief Investment officer at a life insurance company. The business mix is 20% in health; 30% Unit Link, 40% Traditional With Profits Par and 10% in Term + Critical Illness. The assets are INR 1,500 crores.

The broad asset mix is

Government Bonds – 65%

Corporate bonds – 13%

Domestic Equities: 2%

Property 10%

Cash 5%

Unsecured Debentures 5%

i) You have been asked to review the investment policy of the company and prepare a report for the board indicating the appropriateness of the investment portfolio (10)

ii) Evaluate the above asset mix in light of the IRDA Investment Regulations (5)

iii) The CFO has written to you that markets are at a two year low and has recommended enhancement of returns by switching 5% of the portfolio into equities. Briefly discuss his proposal (4)

iv) In addition that the CFO has stated that he expects a recovery in the economic growth in 2014 and hence you must consider investing in

- **a.** Manufacturing Stocks
- **b.** Stocks with highest PE
- **c.** Real –Estate stocks

Respond to his suggestions with reference to the economic activity. You can assume that forecasted GDP growth is 7% pa as against current 6% pa (11)

v) After the recent Investment committee meeting it has been agreed that you would be investing INR.100 crores into equity market. This will be done by selling off the commercial property holding, which is expected to be done by next 3 months and transferring the sale proceeds to Equities. What will be the problems you would face to carry out this switch without use of derivatives? (5)

vi) Explain how derivatives can facilitate this switch. (5)

[40]

Q. 3) Your company holds shares of Novatino Pharmaceutical. Public interest Litigation has been filed in Supreme Court against this company's patent for a cancer drug. However there have been no media reports or information in the market regarding this.

The verdict is expected in next few days and you expect the volatility of the stock to be extreme depending on the verdict.

i) Outline a strategy using a put and a call option which will help you neutralize the effect of the ruling. In your answer construct the best and worst case scenario's arising out of your strategy (4)

Redraft the strategy if only call options were to be used (4)
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