

INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

8th November 2010

Subject CA1 – Core Application Concept (Paper I)

Time allowed: 3 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. *Attempt all questions, beginning your answer to each question on a separate sheet.*
3. **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 3 hours to complete the paper.*
4. *You must not start writing your answers until instructed to do so by the Supervisor.*
5. *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) (a) Define Value at Risk.

(b) Describe how VaR could be used to estimate the relative riskiness of two portfolios, both of which are aiming to beat a specified benchmark.

[4]

Q. 2) A company manufacturing mobile handsets has recently approached a general insurance company about insuring a new product it is planning to launch. The manufacturing company would like to offer its purchasers a guarantee that if the mobile handset has any manufacturing defect then a replacement will be dispatched within 15 days of the of the defect being accepted. For every replacement handset the general insurance company will pay the manufacturer the cost of replacing the handset.

Explain what data would be required in order to determine the risk premium for this business.

[6]

Q. 3) A regulator in a country has the following capital requirements for general insurance companies. The minimum capital companies are required to hold in excess of expected claims liabilities at any point is-

- 30% of claims reserves, plus
- 5% of market value of assets.

Comment on the suitability of such a regulatory regime.

[6]

Q. 4) A small IT company with 60% of employees in age group 25-30, pays annual cash bonus to its employees. In lieu of a cash payment, the company is considering offering following benefits of equivalent value to each employee -

- Additional holiday
- Premium contribution to a comprehensive medical insurance plan, which would cover employee, spouse and children. Premiums are reviewable on an annual basis.

a) Explain why employees may wish to receive their bonus in the form of these two options

b) Describe any problems the employer may face if the options were offered.

[8]

Q. 5) Mr. X who has recently retired from active service has received a lump sum benefit of Rs 2 Million from his employer run retirement benefit scheme. To ensure regular income post retirement, he is considering investing in the following 2 products-

- A conventional guaranteed single life annuity which pays him a flat monthly income throughout his life with no benefit payable on death;

- A Unit Linked Investment Plan which provides a monthly withdrawal facility. The Plan allows Mr X to withdraw money each month by cashing in units at their market value so as to provide him with any income he may need. The Unit Linked Investment Plan comes with multiple fund options. On death of Mr. X, the benefits are paid to his estate for the benefits of any dependents

Discuss the advantages and disadvantages of the above 2 options as vehicles for providing Mr X with the required retirement income.

[10]

- Q. 6)**
- a) Define monetary policy. (1)
 - b) Describe the ways in which a central bank can control the money supply. (4)
 - c) Explain how, in a developed country, a reduction in short term interest rates would affect the following:
 - Yields on government bonds
 - The general level of equity markets (4)
- [9]

- Q. 7)** A premier cricket club has recently been formed to play in a new high profile league. The club's main streams of revenue (in addition to any prize money) are expected to come from:
- Fees from ticket sales
 - Sponsorship, advertising and the sale of television rights
 - Merchandising/licensing of clothing, games etc

Discuss the insurance cover that the club may require.

[10]

- Q. 8)** A pension scheme provides retirement benefits to its members in the form of single life pensions payable from the date of retirement. Members have the option of giving up part of their pension to provide a contingent pension payable to their spouse on their death.

Discuss the factors that should be considered when determining the conversion terms applicable to this option?

[12]

- Q. 9)** A proprietary life assurance company writes only with-profit business. The Marketing Director of the company believes that the company's bonus declarations and hence returns to customers are relatively lower than those of its main competitor (company ABC). He claims that these relatively low payouts are due to an overly conservative investment strategy.

In order to improve competitiveness, the Marketing director thinks that the fund should increase its exposure to equities and take higher credit risk in all asset classes.

Discuss the factors that should be taken into account when considering the Marketing Director's arguments.

[15]

- Q. 10)** In a country, there is a severe price war on term assurance rates between leading life insurance companies. An insurance company wants to introduce preferred customer rates, which would be cheaper than the existing age related standard rates.
- a) Explain why the company may wish to introduce such preferred rates. (2)
 - b) Discuss the rating factors that could be used to identify such preferred lives. (11)
 - c) Describe other issues that should be considered when designing such a policy. (7)
- [20]**
