INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

19th November, 2013

Subject SA5 – Finance

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) All licensed general insurance entities that conduct insurance business in a developed country are subject to new minimum capital requirements prescribed by the Prudential Regulatory Authority [PRA] of that country.

The minimum level of capital that the regulator deems must be held to meet policyholder obligations is referred to as the prescribed capital requirement ("PCR") and takes into account the full range of risks to which a licensed general insurer is exposed.

For capital adequacy purposes, a general insurer is required to hold a capital base in excess of the PCR to ensure solvency. The capital base is calculated as the sum of its Tier 1 and Tier 2 capital after all specified deductions and adjustments.

ABC General Limited is a licensed general insurance company operating in this country. The PCR calculations [expressed in millions of US Dollars] for this company as on 30th June 2013 are given in the following table:

Component of PCR	**USD million**
• Insurance Risk Charge	252
• Insurance Concentration Risk Charge	5
• Market Risk Charge (including asset concentration risk charge)	122
• Credit Risk Charge	30
• Operational Risk Charge	68
• Aggregation Benefit	(92)
• Prescribed Capital Requirement (PCR)	385

The PCR can be calculated using either a standardised methodology prescribed by the regulator or using the company's own internal risk models

ABC General uses internal risk models for estimating PCR which is based on Value at Risk calculated using a 97.5% confidence interval over a one year time horizon

i) Briefly explain the following terms in the given context:

a) Insurance Risk (1)

b) Insurance Concentration Risk (0.5)

c) Market Risk (1)

d) Asset Concentration Risk (0.5)

ii) What is meant by "Aggregation Benefit"? Why do you think this benefit needs to be taken into account in the PCR calculations? (2)

iii) The capital management strategy of ABC General is to optimise capital by managing judiciously the level, mix and use of capital resources within the constraints imposed by PRA.

a) Outline the factors that will influence the amount of capital that can be considered as "optimal" (4)

b) List the different types of capital that can fall under Tier 1 and Tier 2. Explain the issues which ABC General needs to consider before deciding whether to augment capital using either equity or long term debt (5)

iv) From the standpoint of ABC General , discuss the advantages and challenges of using internal models for estimating PCR (6)

v) The capital management actuary at ABC General believes that TVaR (Tail VaR) instead of VaR is more meaningful for estimating insurance risk charge given that insurance loss distributions are skewed.

a) Define VaR and TVaR (2)

b) Do you agree with the view expressed by the capital management actuary? Why or why not? (2)

vi) ABC General is exposed to a particular counterparty in respect of the following derivatives, all of which have a zero market value at the current time and the same nominal amounts

- A one year USD/GBP currency forward
- A USD denominated nominal interest rate swap with a remaining term of 3 years
- A USD/GBP currency swap with a remaining term of 3 years

a) Discuss the credit risk which ABC General faces as a result of each of the above derivatives taking into account the relative size of exposure that can be generated in the future. State assumptions, if any. (6)

b) Discuss the use of credit default swaps and total rate of return swaps to manage credit risk (6)

vii) ABC General is exposed to foreign exchange (currency) risk through its outstanding claims liability from previously written offshore reinsurance business, predominantly denominated in GBP. The company is also exposed to currency risk through investments in foreign securities – primarily UK Securities

Discuss the different ways (including the use of derivatives) that can be used by ABC General to limit (mitigate) currency risk (6)

viii) The CRO (Chief Risk Officer) of ABC General is concerned about the growing level of asset concentration risk over the last three years. Outline the measures that can be adopted for limiting concentration risk in the asset portfolio of the company. (4)

ix) ABC General has recently filed an application with PRA for acquiring CDE General- another general insurance company specialising in auto and home insurance covers. The regulator is concerned with the fact that if the application is approved, the combined entity will have a sixty percent share of the home insurance market and a forty three percent share of the auto insurance market.

Discuss the factors which the regulator needs to consider before granting the approval. The Regulator also wants to specify additional reporting requirements for the combined entity. Discuss what areas may require additional reporting and why? (7)

x) Assuming that the merger went through and the Board of the combined entity [ABCDE General] has approached you to help them identify the value drivers that they should focus upon for driving value of the business and optimising shareholder value .The combined entity has a significant market share of the personal lines market [like auto and home insurance] and a marginal market presence in the other lines of general insurance business [like liability insurance ,workmen's compensation, etc].

Discuss the key value drivers and metrics which, ABCDE General, should focus upon in the immediate future and over the long term (7)

xi) The Prudential Regulatory Authority (PRA) of this country is in the process of drafting the best practice guidelines for corporate governance as applicable to insurance companies

a) Define the term "Corporate Governance" (1)

b) As a part of the proposed corporate governance guidelines, PRA wants the Board of the Insurance Company to constitute the following mandatory committees

i) Audit Committee

ii) Investment Committee

iii) Risk Management Committee

iv) Policy holder Protection Committee

Outline the role and responsibilities of any two of these committees (6)

c) The PRA is evaluating the corporate governance regimes in different countries and is particularly interested in the UK's "comply or explain" regime.

What do you think is meant by a "comply or explain" regime? Outline the advantages and challenges of introducing such a regime vis-à-vis a prescriptive regime (6)

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Q. 2) You are a fund manager for a Commodities Fund (Fund) operated by one of the major asset management companies in the country. The Fund, as part of its portfolio, trades in major commodities such as spices and metals both in physical form as well as derivative instruments based on these commodities. The fund operates through a Commodities Exchange [the only one of its kind in the country].This Exchange is structured as a limited company and run by a Board. In recent times, due to corporate governance issues, the exchange has run into payment crisis. You have been asked by one of the trustees of the Commodities Fund to prepare a report on the working of commodities exchanges worldwide and how we can protect our investments. As part of the report you have been asked to cover the following:

i) A brief description of Chicago Board of Trade (CBOT) (4)

ii) How the commodities exchange specifies the futures' contract in the case of any commodity. You may describe the contract for gold or any other precious metal (4)

iii) The key risk that the fund faces while trading in futures and options on the exchange and what measures the clearing house takes to mitigate this key risk to the traders. You may describe the margining system in detail apart from other risk mitigating mechanisms that may be adopted by the clearing house (12)

iv) The possible reasons for the current payment crisis in the exchange and what options the board of the exchange has to address this crisis (7)

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