

# INSTITUTE OF ACTUARIES OF INDIA

## EXAMINATIONS

7<sup>th</sup> September 2018

Subject SA5 – Finance

Time allowed: Three hours (14.45\* - 18.00 Hours)

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 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 is 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. You are not allowed to carry the question paper in any form with you.

- Q. 1)** Reliable Industries Limited is a large and integrated oil refiner in India. The company has recently received a proposal from an under developed country in African continent to develop an oil field there with promise of tax breaks for a few years. Reliable has found the project to be prima facie attractive as it will enable backward integration. The company would like to analyze the financial feasibility of the project. The project requires an upfront investment of 5 billion USD which it plans to fund with a debt of 3 billion USD and equity of 2 billion USD. Based on current estimate of reserves the oil well is expected to produce oil for about 25 years. The project is expected to be housed under an SPV and the debt is expected to be repaid using the cash flows generated by the project. The SPV will be wound up after the oil production stops
- i)** Capital project appraisal is usually done by NPV analysis of free cashflows expected from the project. The chosen cash flows for discounting can be free cash flow to shareholders (FCFE) or free cash flow to the firm (FCFF i.e. enterprise level free cash flow available to both shareholders and bondholders). Explain what discount rate you would choose for the two approaches. Using a simple numerical example demonstrate how both the methods lead to the same result. You may assume that there is no debt repayment or fresh debt raised during the project (15)
  - ii)** Which of the methods mentioned in **(i)** is suitable for financial appraisal of this project and why? (5)
  - iii)** “When debt to equity ratio changes over the life of a project with fixed life, traditional financial appraisal using a single discount rate for the project may lead to incorrect results” – critique the statement. How can this be corrected? (9)
  - iv)** According to efficient market hypothesis when a company takes up a project its NPV is reflected in the value of equity of the project. Assuming this is correct what further fine tuning can you do to the financial appraisal model? (7)
  - v)** Suggest an approach you can use to adjust the discount rate for country specific credit risk. (3)
  - vi)** Lender to Reliable has suggested that cost of borrowing can come down if the company purchases a political risk cover offered by some global insurer with a good credit rating. What are the major risks that need to be covered under a political risk cover? (10)
  - vii)** What are the values captured by a real option based analysis of the project’s financial appraisal and how is it superior to traditional DCF approach. (6)
  - viii)** How will you monitor the default probability of the project using simulation techniques? (5)
- [60]**
- Q. 2)** A fast developing economy "Valencia" has grown by about 10% p.a. for the last 6 years. It has been experiencing a slowdown in growth for the last 4 quarters. Valencia has also seen a decline in Foreign Direct Investment (FDI) and employment creation. Valencia is an agriculture dominant economy as it contributes about 45% to 50 % of GDP. The country is exposed to natural perils – Earthquake and Flood – whose frequency has gone up in the recent past.

You are hired as senior advisor by the Government of Valencia and asked to help.

- i) Describe the main forms of Government policy that may affect commercial and economic environment of Valencia? What will be your suggestions to bring back growth to 10% p.a. (8)
- ii) Senior Director of Central Bank of Valencia has been asking for greater deal of power and autonomy to be given to Central Bank to manage inflation and currency exchange rate risks. You are asked to list the aspects of the economy that a Central bank may have control over and different ways or methods that the Central Bank can achieve to ensure inflation and Exchange rate stay at desired level. (8)

Government has announced massive farm loan waiver which has become frequent, unpredictable and large in quantum thus inviting criticism from tax payers. Government is keen to explore using alternative ways to protect farmers from the financial difficulties but at the same time make its financial obligations towards farm loans minimum and predictable.

- iii) Explain possible options that you will suggest to Government of Valencia to manage the risk of large and untimely payouts/write-offs? (8)

One of the methods you have suggested includes transferring the risk to market participants in the form of Parametric Weather Bonds where redemption value will largely depend on 'Index' whose value is a function of intensity of all natural perils including Earthquake and Flood.

- iv) Outline the factors that need to be taken into consideration for the design and issuance of the Parametric Weather Bonds. (8)
- v) Outline the risk and attractiveness of such a bond to institutional investors. (8)
- [40]

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