INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

21st November 2013

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 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 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)** When expectations of a move in interest rates by a central bank change, the stock market may move considerably. Why does this happen? (6)

ii) The market participants are keenly following the strategy adopted by the US Federal Reserve (FED) on what they term as "Quantitative Easing". What is quantitative easing? The FED recently suggested a plan to taper the quantitative easing and this led to a fall in stock prices. Why? (4)

iii) For the first time in three years, the yield on the Indian 10-year government bond is the same as the yield on a 1-year government bond. What does this signify? (2)

[12]

Answer questions 2, 3 and 4 based on the following information.

You are the investment actuary of GABIC - a large non-life insurance company in the country of Alcabulca which predominantly writes yearly renewable Motor (both Own Damage and Third Party roughly in equal proportion) and Health policies and to a small extent Liability policies. The insurance industry in this country is regulated by Insurance Regulatory and Development Authority of Alcabulca (IRDAA). IRDAA allows non-life insurance companies to invest only in bonds which are rated AA or AAA or equivalent. Of late Alcabulca has witnessed a plethora of callable bond issues and the internal assessment is that IRDAA will soon allow the companies to invest in callable bonds also.

XYZ is a company that recently issued callable bonds. The annualized yield of a 1 year non-callable bond of company XYZ is 8.50% and annualized yield on a 2 year non-callable bond is 8.40%. A 2 year bond of XYZ with an option to call after one year is available at a price of 99. All the bonds have face value 100 and coupon rate of 8% payable semi-annually. The bonds were rated AAA by rating agencies.

GABIC has been following the maturity matching strategies for Asset Liability Management (ALM) till date. Of late IRDAA is asking companies to analyze the duration of the bond portfolio also for ALM purposes.

Q. 2) **i)** What is a callable bond and what are its characteristics? (3)

ii) What could be the possible reasons why companies issue callable bonds? (6)

[9]

Q. 3) **i)** Calculate the annualized yield of the callable bond under the following 2 scenarios

- Bond will be called after one year
- Bond will be held to maturity

Based on these calculations GABIC's fund manager suspects that there is mispricing here. What could be his rationale? (5)

ii) Do you agree with the fund manager that the market is mispricing the bonds? Explain your point of view using an appropriate illustration. Ignore transactional costs for the purpose of your illustration. (6)

iii) Draw a price vs. interest rate (free hand) sketch for the 1 year non-callable bond, 2 year non-callable bond and the callable bond of XYZ for illustrating the callable bond pricing behavior and explain. (10)

[21]

Q. 4) **i)** What are the disadvantages of maturity matching in general? (4)

ii) The fund manager is of the opinion that duration matching strategy is not so important from GABIC's point of view. What could be the rationale behind his comment? Do you agree? (5)

iii) If duration analysis is indeed to be performed prepare a note to the investment team as to how to arrive at the duration of a callable bond. (Hint – Use Monte Carlo simulation) (6)

iv) A recent article in a derivative magazine has the following statement - Much of the current activity in swaptions has been fueled by an arbitrage between the swaption and callable bond markets. In the context of the discussion on callable bonds explain the meaning of this statement. (4)

[19]

Q. 5) Ram and Shyam recently met at their alumni reunion at school. Ram is an actuary while Shyam is an active investor in the Indian equity market. Analyze the conversation given below and identify the behavioral biases which Shyam is exhibiting giving proper explanation.

Ram: Hello Shyam, How are you? What are your recent investment operations?

Shyam: I am having a pretty tough time. I invested in ABC Pharmaceuticals Ltd.. It is a pharmaceutical company and I had foreseen enormous export opportunities for the company. The stock was around 1,000 when I invested. But recently the USFDA (which certifies the manufacturing facilities) found serious quality issues with their output and the stock fell sharply. It will be very difficult for the Company to restore their export market.

Ram: So have you exited?

Shyam: Not yet. I will exit once the stock recovers to 1,000. I also came to know that they have valuable real estate in Delhi which they may monetize. So I am holding on.
Then I identified a battery manufacturer – Hamari Rani Batteries. The stock price was 514 and my own analysis shows that the fair value of the stock is about 1,100. They have a pretty competent management team.

Ram: So did you buy that?

Shyam: No. By the time I made my decision to buy, the Company declared its quarterly results and the management guided for very strong sales and profit growth. It was much higher than what I had modeled. The stock price went up by 20% in one day and has been ruling around those levels.

Ram: Maybe, it is still not late.

Shyam: Probably yes. But I would rather wait for a correction and buy around 520.

Ram: What happened to Reliable Industries which you recommended when we met last time? I am not tracking the stock.

Shyam: At that time, I had told you that they will strike oil in deserts of Rajasthan and that is precisely what happened. The stock has gone up by 30% on that news alone.

Ram: So you would have made a fortune.

Shyam: Not really. Reliable was just 0.1% of my portfolio. But my recommendation was right.

Ram: Overall you seem to be having a tough time.

Shyam: To an extent 'yes'. My portfolio was down by 7% when the index went up by 3% over the last one year. But I read in a newspaper that the renowned investor June-July-Wala's portfolio was down by 10% during the same period.
I also plan to get into index derivatives and commodities trading where traders are minting money.

Ram: But do you have the expertise. I think it's a different cup of tea altogether.

Shyam: It is all one form of investing or the other. That is where money can be made now. I need to recover from my losses too. **[12]**

Q. 6) A big conglomerate called REL Ltd. which has interests in oil and gas, telecommunication, real estate, financing etc. and accounts for nearly 10% by weight of the stock index in the country. The primary source of revenue and profit for the company is the oil and gas business. The Stock Exchange deals in the company's stock as well as futures and options on the stock and is responsible for the management and calculation of the stock exchange index. The Company decides to demerge its non-oil and gas business lines into a separate entity REL-New. All shareholders will be entitled to receive the shares of REL-New which will eventually be listed separately. The price of REL is expected to decline by about 20% on account of the demerger.

i) What are the advantages and disadvantages of companies that prefer a conglomerate structure? (4)

ii) Why do you think that the management is going for a demerger? (3)

iii) What are the steps that the stock exchange should take to adjust for the demerger? Use a simple numerical example to make your argument clear. (9)

[16]

Q. 7) Infrastructure Finance and Development Corporation (IFDC) sold a 50 year bond in Dec 2012 at a yield of 7.744%. This yield was at a premium of 180 bps over the then prevailing 30 year G-Sec yield.

i) What are the possible reasons for the Corporation to choose to sell such a long dated bond? (2)

ii) Who do you think are the classes of investors who would have purchased this bond? What is their rationale for purchase? (3)

[5]

Q. 8) The Government has announced that it will increase value added tax (VAT) from 17.5% to 25% with immediate effect. It has said that the moneys raised will be used to reduce public sector debt. VAT is an indirect tax levied on certain goods at the point of sale. Explain the potential effects of this change on each of the public, business and personal sectors of the economy. **[6]**

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