INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

18th May 2011

Subject SA6 – Investment

Time allowed: Three 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. ****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 same 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.***

AT THE END OF THE EXAMINATION
Please return your answer book and this question paper to the supervisor separately.

Q. 1) **a)**

(i) Describe the characteristics of a Treasury Bill. (1)

(ii) Describe the characteristics of a government agency security. (1)

(iii) Describe the characteristics of the call/notice money market. (1)

(iv) Describe the characteristics of a Certificate of Deposit. (1)

(v) Describe the characteristics of commercial paper. (1)

(vi) Describe the characteristics of a banker’s acceptance/eligible bill. (1)

(vii) Rank the above in terms of return for investment and explain your reasoning. (1)

b)

(i) Define a repo and a reverse repo. (2)

(ii) Describe the mechanics of a repo. (1)

(iii) What are the risks associated with such a transaction and how can they be mitigated? (2)

(iv) Why is there a need for a repo market? (2)

(v) Give examples of how repos are used in India including which instruments are usually repoed. (1)

(vi) What is a meant by a repo “trading special” and why does it occur? (2)

(vii) If the cash market in a GSec settles on a T+1 basis and the repo market settles on a day T basis, explain how a primary dealer can fund the purchase and later selling of a GSec using the repo market. (6)

(viii) What is the major risk associated with the strategy in vii) and how could it be mitigated? (1)

c)

(i) How is LIBOR/MIBOR calculated? (4)

(ii) What is the major issue with a LIBOR/MIBOR benchmark? (1)

d)

(i) Describe the characteristics of an interest rate swap. (2)

(ii) Describe the characteristics of an OIS swap. (2)

(iii) What are the risks associated with an interest rate swap and how are they mitigated? (2)

e) In India the OIS swap spread over the government yield curve has been consistently negative i.e. OIS rates are generally lower than GSec yields. The yield on purchase of a particular government security is 8.47% assuming held to maturity, the average repo rate is 7.34%, MIBOR OIS is 9.06% and fixed leg of OIS swap is 7.71%.

i) Explain how, in theory, a trader could take advantage of this anomaly. (5)

ii) Suggest reasons why this anomaly exists. (2)

f)

i) Describe the characteristics of a forward contract and how is it different from a futures contract. (3)

ii) A bank has US dollar denominated strategic (i.e. unlikely to be sold) investments. How might it hedge the value of these investments using forwards? (2)

iii) Given the lack of a term interbank market (i.e. banks lending money between themselves for a period more than 14 days) banks can synthetically construct such instruments using US dollar LIBOR term rates and foreign exchange instruments. Explain how this might be done. (3)

[50]

Q. 2) You work in the investment team of a leading financial services company in India. Your organisation has an Asset Management Company (AMC) with a large Asset Under Management (AUM) and uses derivatives to hedge and to make trading calls. You are asked to advise on the following strategies which the management is currently contemplating given that the situation is very volatile in the capital markets and there is uncertainty related to impact of Earthquake and Tsunami followed by a constant threat of radiation in many parts of the country. There is also a heightened concern over Libyan crisis leading to escalation in the price of crude oil. You have a portfolio of Rs 1827 crores and beta of your portfolio is 0.8. Despite so many difficulties you find that in the last 10 days of March the stock prices have been rising constantly on net inflow of funds from foreign investors to the tune of Rs 1.4 billion dollars in the country's stock market. You believe the stock markets have risen too fast in the last 10 days of March despite the problems mentioned above.

You have decided to go short on index futures (NIFTY) to hedge your stock portfolio over the next 2 months (i.e. ending May 2011).

1) You find that the traded price of NIFTY Index as on 1st April is 6000 and the June expiry futures are quoting at 6090. The minimum lot size for trading is 50 i.e. 1 contract is on 50 times the Index. What would be the number of futures which you need to short to fully hedge your exposure to equities. If you want to change the beta of the portfolio to one what would be your approach using futures contract. (3)

2) If the dividend yield on index for 2 months (till end of May) is 0.25% and the risk free rate for the two month period is 1% then show that the hedged portfolio will have the same value of Rs 1848.924 crores in both upside and downside situations wherein the index goes up to 6150 level or drops to 5850 by the end of May. Assume the futures price at the end of May 31st will be 6180 or 5880 respectively. (5)

3) After a week you find that the market has corrected a little and currently NIFTY is trading at 5900. You feel the markets would remain range bound for some time and should move between 5800 to 6000 range. You want to profit from this view and are willing to risk a loss if the NIFTY makes large moves out of the range on either side. Please create a possible option spread strategy using the April strike price of call options on NIFTY given below and show the profit or loss in 5 different situations when closing prices of NIFTY at expiry date is 5800, 5850, 5900, 5950, 6000 . (5)

Strike price of options	Price of call options	Open Interest('000)	No. of contracts
CE-5500-Apr	366.85	1169	3769
CE-5600-Apr	274.25	1045	4245
CE-5700-Apr	193.25	2618	11259
CE-5800-Apr	121.25	4499	109446
CE-5900-Apr	69	6404	347473
CE-6000-Apr	35.35	7292	248335
CE-6100-Apr	15.7	3914	130660
CE-6200-Apr	6.45	2939	74973

4) The price of put options is also given herewith. If you have the same view as the previous question wherein you think the NIFTY would remain range bound and has very little possibility to make big moves outside the 5800-6000 range. To profit from this view if you want to use put options instead of call please explain what is a possible strategy using the given the following put option strikes and their prices. What is the possible profit or loss if NIFTY closes at expiry date at following different levels:
5800, 5850, 5900, 5950, 6000 (5)

Strike price of options	Price of put options	Open Interest('000)	No. of contracts
PE-5500-Apr	14.4	4556	87490
PE-5600-Apr	25.55	5122	115311
PE-5700-Apr	43.15	6475	185805
PE-5800-Apr	71.65	5439	280149
PE-5900-Apr	116.25	3265	258183
PE-6000-Apr	179.55	1644	33812
PE-6100-Apr	260.45	147	2394
PE-6200-Apr	349.5	209	1074

5) The market traded in the range as predicted and closes at 5850 at the end of the week giving you some good profit from the above option spread strategy. Now you feel the last few days of April will witness very high volatility. The VIX or the volatility indicator is expected to peak near the expiry of the April futures. Though the markets are expected to be choppy you're not sure which direction NIFTY may move since there are both good and bad news in equal measure. On the oil front the prices are still going up and inflation control measures are seen coming with RBI likely to increase the interest rates. However the FII inflows is continuously happening on the expectation that Indian Rupee will strengthen against dollar and the Indian stock markets would continue to deliver. In such a situation you would like to create a strategy which would generate profit from the high volatility expected. The price of various call and put options are same as given in the tables above in question 3 and 4. Please suggest an appropriate combination of different options which would result in a cost / loss if the markets move in a narrow band but would yield profits if the NIFTY happens to swing in either direction. (5)

6) What would happen to the option prices if many of the company results are likely to be declared towards the end of April and all market participants are having similar views about the market volatility being high since they are not sure what is in store in the company results and feel that the market may move in a big way on either side. (2)

7) Your company also has a brokerage firm and you decide to inform all your clients (both retail and institutional clients) about the sharp movements which may take place from the current NIFTY value of 5850. There is an institutional client who feels that if the market rises it would go upto 6100 but not beyond and if it falls it would go to 5600 and not below. It wants to create a trading strategy based on this view and you advise them to buy a put option with strike of 5800 and sell two put options with strike of 5600. Similarly on the bullish side you advise them to buy a call with a strike of 5900 and sell two calls with a strike of 6100.

   You need to determine the total profit or loss on the trading strategy in two different scenarios :

   1) When the NIFTY moves upwards to 6050.

   2) When it moves down to 5650. (4)

8) Though you have been advising your AMC and the brokerage clients on their trading strategy your company focuses on good quality research and likes to pick value stocks at low cost as long term investments. You want to identify value stocks from small or mid cap companies and it is difficult to track all details of all of these companies. You want to filter the stocks based on certain value parameters and then focus on a few of them for detailed research trying to understand the industry and company strengths including management quality and future plans. Some of the value parameters are given below.

a) EPS (Earnings per share).

b) P/E ratio.

c) Dividend yield.

d) Price / Book Value.

e) Stock Price / Replacement Value or Q-ratio.

Please compare the above metrics informing as to what they tell about the company and the level of the markets and state that out of the above metrics if you have to use only two of them then which two you would prefer for fundamental analysis and forecasting tool for good future performance and thus identifying the right stocks for investments.

(6)

9) Your company as mentioned above believes in value investing principles and likes to put these principles as core for making stock investments by fund managers. You are a great fan of Warren Buffet's philosophy on value investing. He was recently in India for the first time and there has been a discussion on identifying value stocks in India. You want to help your firm in summarising some of the principles of value investing which can be applied to picking the right stocks. Please formulate some broad principles of value investing which can help budding young fund managers to understand and apply them in creating a winning portfolio of stocks for the future.

(6)

10) In your firm apart from the champions of value investing there are two other sections of investment people who believe in a different approach to investments and making money from the market. They are investors who allocate money to different asset classes depending on various economic indicators and then there are the third types who are primarily traders, momentum and trend traders who would use market price and its current and past behaviour as the single metric for making trading calls. The details of these two types of investors or traders (both of whom are different from the value investors in stocks)are given below in "a" and "b". You need to answer a few questions related to each type.

a) Asset allocation investors firmly believe that good asset allocation generates far superior returns as compared to stock selection. They use economic indicators to predict the growth or fall in the price of various asset classes. They will go in cash if they feel that the stock market will be bearish. They will go overweight in a currency or commodity if economic indicators point the same. When they feel that the markets are underpriced they would prefer to buy and hold good quality companies from the NIFTY (large companies in different sectors) or just invest in the Index (through exchange traded funds etc) rather than attempting to identifying the best stocks amongst a gamut of stocks available. They rely on the use of economic indicators for making asset allocation. They

allocate assets to stocks, commodities, currencies, real estate and cash depending on which is priced relatively better and also on future outlook of the asset as predicted by such leading economic indicators.

i) Which indicators amongst the following are lead economic indicators? What are the limitations of such lead indicators in predicting economic upturn or downturn. (2)

(a) Money supply.

(b) Unemployment numbers.

(c) Capital expenditures.

(d) Change in new order and supplies for durable goods.

(e) Changes in new order and supplies of consumer goods.

(f) New approvals / permits for housing / construction.

ii) Can such lead economic indicators be used to forecast stock prices as well? What are the limitations in using such lead indicators to forecast stock prices? (2)

iii) How do reserve requirements of RBI (through change in Cash Reserve Ratio and Statutory Liquidity Ratio) impact the stock prices in the short term. (1)

iv) The third type as mentioned above are traders who believe it is possible to identify bull and bear trends through the behaviour of market prices of the asset class concerned and or other derivatives based on the price of the underlying. They believe it is possible to make a lot of money even in a declining (bearish) market. These traders also use certain indicators to find whether a trend has been established or not and then take positions accordingly. Some of the indicators used by them are given below: Please explain what these indicators are and how they can be used.

(a) Put-Call Ratio.

(b) Advance-Decline Ratio.

(c) Advance-Decline Line.

(d) Total Shorts / Total Volume ratio.

(e) 20-Day Exponential Moving Average.

(f) Share price and Volume of shares, moving in the same direction. (4)

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