

INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

14th May 2015

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 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 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)** There are three swaptions available in the market with identical characteristics except that first is an American swaption, the second is a European swaption while the third is a Bermudan swaption. Their latest quotes (Last Traded Price) as seen on Bloomberg are as follows
- American swaption Rs 40,
 - European swaption Rs 30
 - Bermudan swaption Rs 50.
- i) What is a Bermudan Swaption? (1)
- ii) Comment whether the prices of the options look sensible or not. (2)
- iii) Define Arbitrage. (1)
- iv) Assuming that the American swaption is priced correctly, discuss whether there is any arbitrage opportunity available here. (3)
- [7]
- Q. 2)** The NSE NIFTY has seen a lot of upswing and downswing for the past few months. You have joined as the Chief Investment Officer of a large life insurance company managing a portfolio comprising 75% Equities, 15% bonds and remaining cash. The equity portfolio has a beta of 0.98. The CEO of the Company expects the equity market to continue with the large movements but is uncertain of the direction.
- i) Assuming no regulatory restrictions on investment asset types, suggest a couple of investment strategies that the Company can adopt to make profit from the *expected* market movements. Support your answer with a diagram wherever applicable. (6)
- ii) The Appointed Actuary of the Company has advised the Board that the asset mix of the company's fund is inappropriately biased towards equities and the bond exposure is required to be increased. Suggest some reasons why the Appointed Actuary might have given such advice? (3)
- iii) You are inclined towards using swaps to achieve this objective instead of cash market transactions. Discuss the advantages and disadvantages of using swaps instead of cash market transactions to change the asset mix of a fund portfolio. (5)
- [14]

- Q. 3)** You are the CEO of ABC Bank and have received the following proposal from a non-life insurance Company's CEO.

"We understand that ABC Bank wishes to become a distribution partner of our insurance company's home insurance policies and would also like to become a shareholder in our Company. In this respect, we would like to offer you a 5% shareholding (2 Cr shares) in our Company at Rs 10 per share. After five years, you can continue being a shareholder or you can divest your stake back to us at Rs 25 per share or the market value of the shares at that time. I expect my Company's valuation to grow at 15% pa in the future which is double than what you are earning by keeping your surplus money in government securities."

The market value of the insurance company currently is Rs 500 Cr. Recent data suggests that the volatility of its share price has been 30%.

- i) Evaluate the expected value of offering this deal for the insurance company. Why do you think the Company set the buy-back price at Rs 25? (8)
- ii) If you wanted to negotiate with the Company, what are the possible avenues that you would consider? (2)

[10]

- Q. 4)** i) What is put-call parity? Derive the put-call parity relationship explaining each step and clearly stating all the assumptions that you are making. (8)
- ii) TTC Limited is the 5th largest constituent of the main stock index in Indiana which has a reasonably deep derivative market. The quotes for options of TTC Limited as on 2nd March 2015 for a call and put option with strike 340 is as follows:

	<i>Bid</i>	<i>Ask</i>
<i>Call</i>	12.00	12.10
<i>Put</i>	7.50	7.60

The current market price of TTC is 346 per share and interest rate may be taken at 10%. The contract expires on 26th of March 2015. Comment on the above scenario based on your understanding of Put-Call Parity (7)

[15]

- Q. 5)** Consider the information below regarding a fund and index returns. The benchmark for the fund is an investment that has equal exposure towards equities and debt.

	March 2014 Rs Cr	March 2015 Rs Cr	Cash flow Rs Cr	Investment Income Rs Cr
Equities	650	750	-10	10
Debt	300	440	70	20
Cash	50	50	-1	1

An analyst has performed some performance attribution and has come up with the following results:

	Actual	Benchmark
Fund Return	17.58%	10.3%
Equity Return	17.05%	15%
Debt Return	20.9%	5.6%
Cash Return	2.0%	4%

Sector selection outperformance	1.02%
Stock selection profit for equity	1.29%
Benchmark equity yield	3.5%
Benchmark debt yield	4%

Assuming that the figures provided by the analyst are correct, provide a qualitative commentary on the results of the analysis performed by the analyst. [8]

- Q. 6)** A life insurance company is launching a unit-linked product where it wishes to provide a minimum guarantee on maturity to the policyholder that maturity value will be higher of the unit-fund value at maturity or 110% of the premiums paid. The Appointed Actuary of the Company is contemplating whether any extra reserve required for this feature.

State clearly the various steps pertaining to ALM that the Appointed Actuary must undertake to arrive at a reasonable level of such a reserve. [5]

- Q. 7)** In a country ABC, online retailing is growing at a rapid pace. Bliplkart is a 3 year old online retail company which works on a market place model i.e. it provides an online platform for customers to place orders with vendors and charges a commission from the vendors which is a % of the invoice value. The company is growing at a rapid pace and has hit the Gross Merchandise Value sold of 1000 Cr ABC rupees in this short period. You are a newly recruited investment actuary of the ABC operations of a global asset management company. The Chief Investment Officer of your company has received some information from market sources that Bliplkart is probably going to do a fund raising for the first time. He believes that Bliplkart could be one of the major players in this space a few years from now. He has asked you to discretely prepare a preliminary investment thesis including suggested valuation for the company from available information.

What factors will you consider (and problems you might face) when making this report? [15]

- Q. 8)** Veda Inc. is the holding company of Mesa Limited which is a miner of iron ore. Mesa Limited also owns a large Copper smelting operation and an Aluminium smelter. Recently Veda Inc. acquired 60% stake XYZ Energy – an oil producer. Out of the 60%, 18% is held through Mesa Limited. The remaining stake lies with the public. Veda recently announced that it is considering the merger of Mesa with XYZ through share swap deal wherein XYZ shareholders will get shares of combined entity.

- i) Based on the following information (as of year ended March 2014) comment on the rationale for this move. (7)

FY14 BALANCE SHEET - in Cr

	MESA	XYZ
SOURCES OF FUNDS :		
Share Capital	297	1,908
Reserves Total	33,382	55,530
Total Shareholders Funds	33,679	57,438
Total Debt	38,943	-
Other Liabilities	396	3,113
Total Liabilities	73,018	60,551
APPLICATION OF FUNDS :		
Net Fixed Assets	22,584	21,211
Capital Work in Progress	17,327	5,697
Producing Properties	-	3,864
Investments	22,767	16,364
Total Current Assets	20,811	18,554
Total Current Liabilities	10,472	4,404
Net Deferred Tax	-	(736)
Total Assets	73,018	60,551
FY14 PROFIT AND LOSS -in Rs. Cr		
	MESA	XYZ
INCOME :		
Net Sales	28,537	18,762
Other Income	1,817	1,503
Raw Materials	18,765	-
Other Expenses	8147	5,090
Interest	3,565	41
Depreciation	1,505	2,297
Profit Before Tax	(1,072)	12,850

- ii) The minority shareholders of XYZ have opposed this move. What could be the possible reasons? (9)

[16]

Q. 9) Define the following terms:

- a. Deflators
- b. Eurobond
- c. Non-recourse loan for a project
- d. Par yield curve
- e. Tracking error

[10]
