DERIVATIVES

Q.1. Mr. Sharma is considering buying a 8-month future contract of GE Inc. which is quoting at $108 in spot market. Assuming CCRFI of 6% p.a. and the company is certain to pay dividends of $0.50 per share after 3 months, 6 months, & 9 months, calculate the Futures price. [Given: $e^{0.01}$ = 1.01005, $e^{0.02}$ = 1.02020 $e^{0.03}$ = 1.03045 $e^{0.04}$=1.04081 $e^{0.05}$ = 1.05127]

Q.2. Mr. Lucky, a portfolio manager at Kotak Securities, own following three blue chip stocks in his portfolio:-

Security	No. of shares	CMP	Beta
Reliance Industries	2,000	1200	1.2
Infosys Tech	4,000	1000	0.8
State Bank of India	5,000	300	1.6

(i) Calculate Portfolio Beta

(ii) PM is worried about sudden market fall down, how can he bring down his portfolio beta to 0.6

(iii) What should he do to increase it to 1.40

(iv) Assuming that Nifty spot is 5400 points and Nifty futures are trading at 5500 points having a contract size of 25. How can he obtain the same position as in (ii) and (iii) by dealing in Nifty Futures?

SWAPS

Q.3. ABC Bank is seeking fixed rate funding. It is able to finance at a cost of six months LIBOR + ¼ % for ₹ 200 million for 5 years. The bank is able to swap into a fixed rate at 7.5% versus six month LIBOR treating six months as exactly half a year.

(a) What will be the “all in cost” funds to ABC Bank?

(b) Another possibility being considered is the issue of a hybrid instrument which pays 7.5% for first three years and LIBOR – ¼% for remaining two years.

Given a three year swap rate of 8%, suggest the method by which the bank should achieve fixed rate funding. [(10 Marks), CA Final May 2010]

FOREX

Q.1. A company in UK will need to make a payment of $ 2,50,000 in six month's time. Following market information is available.

	Forex (Indirect quote)	FX Options
Spot	$ 1.5617-1.5773	
Six months forward	$ 1.5455-1.5609	
Exercise Price		1.70
Six months call		$ 0.037 c per Pound
Six months Put		$ 0.096 c per Pound
Contract size		Assume: Pound 12,500

Money Market Rates

	Deposit	Borrow
US $	4.50	6
UK Pounds	5.50	7

The company is considering, forward rates, money market hedge and Options. Give your reasoned recommendations on the best alternative.

Q.2. XYZ Ltd. is an export oriented business house based in Mumbai. The Company invoices in customers' currency. Its receipt of US $ 1,00,000 is due on September 1, 2009.
Market information as at June 1, 2009 is:

Exchange Rates US $/₹		Currency Futures US $/₹	Contract size	₹ 4,72,000
Spot	0.02140	June	0.02126	
1 Month Forward	0.02136	September	0.02118	
3 Months Forward	0.02127			

	Initial Margin	Interest Rates in India
June	₹ 10,000	7.50%
September	₹ 15,000	8.00%

On September 1, 2009 the spot rate US $/Re. is 0.02133 and currency future rate is0.02134.

Comment which of the following methods would be most advantageous for XYZ Ltd.

(a) Using forward contract
(b) Using currency futures
(c) Not hedging currency risks.

It may be assumed that variation in margin would be settled on the maturity of the futures contract. [CA Final May 2015(Similar), Nov 2016(Similar)]

Q.3. An importer booked a forward contract with his bank on 10th April for USD 2,00,000 due on 10th June @ ₹ 64.4000. The bank covered its position in the market at ₹ 64.2800.

The exchange rates for dollar in the interbank market on 10th June and 20th June were:

	10th June	20th June
Spot USD 1=	₹ 63.8000/8200	₹ 63.6800/7200
Sport/June	₹ 63.9200/9500	₹ 63.8000/8500
July	₹ 64.0500/0900	₹ 63.9300/9900
August	₹ 64.3000/3500	₹ 64.1800/2500
September	₹ 64.6000/6600	₹ 64.4800/5600

Exchange Margin 0.10% and interest on outlay of funds @ 12%. The importer requested on 20th June for extension of contract with due date on 10th August.

Rates rounded to 4 decimal in multiples of 0.0025.

On 10th June, Bank Swaps by selling spot and buying one month forward.

Calculate:

(i) Cancellation rate
(ii) Amount payable on $ 2,00,000
(iii) Swap loss
(iv) Interest on outlay of funds, if any
(v) New contract rate
(vi) Total Cost

[(9 Marks) CA Final May 2015]

Solution:

(i) Cancellation Rate:

The forward sale contract shall be cancelled at Spot TT Purchase for $ prevailing on the date of cancellation as fo lows:

$/ T Market Buying Rate	₹ 63.6800
Less: Exchange Margin @ 0.10%	₹ 0.0636
	₹ 63.6163

Rounded off to 63.6175

(ii) Amount payable on $ 2,00,000

Bank sells $2,00,000 @ ₹ 64.4000	₹ 1,28,80,000
Bank buys $2,00,000 @ ₹ 63.6175	₹ 1,27,23,500
Amount payable by customer	₹ 1,56,500

(iii) Swap Loss

On 10th June the bank does a swap sale of $ at market buying rate of ₹ 63.8300 and forward purchase for June at market selling rate of ₹ 63.9500.

Bank buys at	₹ 63.9500
Bank sells at	₹ 63.8000
Amount payable by customer	₹ 0.1500

Swap Loss for $ 2,00,000 in ₹ = ₹ 30,000

(iv) Interest on Outlay of Funds

On 10th April, the bank receives delivery under cover contract at ₹ 64.2800 and sell spot at a ₹ 63.8000.

Bank buys at	₹ 64.2800
Bank sells at	₹ 63.8000
Amount payable by customer	₹ 0.4800

Outlay for $ 2,00,000 in ₹ 96,000

Interest on ₹ 96,000 @ 12% for 10 days ₹ 320

(v) New Contract Rate

The contract will be extended at current rate

$/ ₹ Market forward selling Rate for August	₹ 64.2500
Add: Exchange Margin @ 0.10%	₹ 0.0643
	₹ 64.3143

Rounded off to Rs. 64.3150

(vi) Total Cost

Cancellation Charges	₹ 1,56,500.00
Swap Loss	₹ 30,000.00
Interest	₹ 320.00
	₹ 1,86,820.00

PORTFOLIO MANAGEMENT

Q.1. From the data given below calculate the probability of getting a return less than 8% and decide which security is to be selected on that basis:

Security	A	B
Return	15%	20%
Risk	5%	10%

What if you want to take a decision on the basis of probability of getting a return more than 25%?

Z	0.50	1.0	1.2	1.4	1.5	2.0	2.5
P	0.3085	0.1587	0.1151	0.0808	0.0668	0.0228	0.0062

Q.2.

Year	Market Returns	Returns from Ril
2012	15%	20%
2013	5%	15%
2014	-10%	-25%
2015	30%	5%
2016	10%	12%

Q.3. An investor has ₹ 15 lakhs to invest. He wants to use the constant value plan for managing his investments. He wants to invest his money equally in stocks and bonds. He identified a stock for investing, which is currently trading at ₹ 250. He wants to rebalance his portfolio whenever there is a 10% change in the value of the basic portfolio. Show the rebalancing action taken by the investor. Also calculate the number of shares held by him and his gain at the end. Compare the gains from the constant dollar value plan with those from a passive buy and hold strategy. Suppose the price of the stock moves as follows; 250, 220, 200, 220, 240, 260, 288, 250.

CAPITAL BUDGETING

Q.1 Jaipur Municipal Corporation plans to build a bridge over a crossing. The construction work is expected to last 5 years and will be undertaken by a private sector firm to which ` 100 lacs will be payable at the end of year 1 and ` 50 lacs each at the end of next 4 years.

The annual maintenance cost of the bridge is expected to be ` 10,00,000 at current prices. This cost is expected to increase at 7% p.a. At the end of 15 year after completion the bridge will require a major repair work requiring materials of ` 100 lacs and expenses of ` 100 lacs, both in current prices. The prices of materials are expected to rise at the rate of general inflation for 16 years & constant thereafter but expense cost is expected to rise 6% over the general inflation for the first three years and then will increase in Iine with general inflation rate.

The required rate of return may be taken as 17% p.a. and the life of the bridge may be taken as infinite. Numbers of vehicles using the bridge per day is 20,000 and the toll tax is expected to increase in line with general inflation. Find out the minimum toll tax chargeable per vehicle in the first year of operation so that the investment in bridge may breakeven over its life. (Assumption: All annual cash flows arise on the last day of the year.)

Q.2 Replacement Decisions

Case I)

Remaining Useful life	5 years	5 years
Sale Value as of today	80000	
Purchase Price		500000
<u>Yr 1 – 5</u>		
Revenue	150000	600000
Cash Operating Cost	115000	350000
After 5 years		
Salvage Value	25000	125000
Book value as of today	75000	
Tax @ 30%		
Disc Rate @ 15%		

Case II)

Remaining Useful life	5 years	**8 years**
Sale Value as of today	80000	
Purchase Price		500000
<u>Yr 1 – 5</u>		
Revenue	150000	600000
Cash Operating Cost	115000	350000
After 5 years		
Salvage Value	25000	125000
Book value as of today	75000	
Tax @ 30%		
Disc Rate @ 15%		

Case III)

Cost of Asset = 500000
Life = 4 yrs
Discounting rate = 15%

Particulars\Year	**1**	**2**	**3**	**4**
Salvage Value	400000	325000	175000	75000
CFs	250000	220000	160000	110000

Case IV)

New Car

Cost of Asset = 500000
Life = 5 years
Annual Operating Cost
= ₹ 85000
Salvage Value = 200000

Old Car

Particulars \ Year	**0**	**1**	**2**	**3**
Salvage Value	120000	100000	80000	40000
Annual Operating Cost		130000	140000	175000

Discounting Rate = 12%

BUSINESS VALUATION

Q.1. Following information are available in respect of XYZ Ltd. which is expected to grow at a higher rate for 4 years after which growth rate will stabilize at a lower level:

Base year information:

Revenue	–	₹ 2,000 crores
EBIT	–	₹ 300 crores
Capital expenditure	–	₹ 280 crores
Depreciation	–	₹ 200 crores

Information for high growth and stable growth period are as follows:

	High Growth	Stable Growth
Growth in Revenue & EBIT	20%	10%
Growth in capital expenditure and depreciation	20%	Capital expenditure are offset by depreciation
Risk free rate	10%	9%
Equity beta	1.15	1
Market risk premium	6%	5%
Pre tax cost of debt	13%	12.86%
Debt equity ratio	1:1	2:3

For all time, working capital is 25% of revenue and corporate tax rate is 30%.

What is the value of the firm?

MERGERS & ACQUISITIONS

Particulars	**Acquirer Co.**	**Target Co**
Earnings after taxes	Rs.10,00,000	Rs.7,50,000
Number of shares	40000 shares	37,500 shares
Earnings per share	25	20
P/E Ratio	10	8
Market Price	200	160

If Gain/Loss to Acquirer & Target is in the ratio of 3:2.
Compute Swap ratio

RISK ANALYSIS IN CAPITAL BUDGETING

Q.1. A company is considering two mutually exclusive projects X and Y. Project X costs ₹ 30,000 and Project Y ₹ 36,000. You have been given below the net present value probability distribution for each project.

Project X		Project Y	
NPV Estimate (₹)	Probability	NPV Estimate (₹)	Probability
3,000	0.1	3,000	0.2
6,000	0.4	6,000	0.3
12,000	0.4	12,000	0.3
15,000	0.1	15,000	0.2

a. Compute the expected net present value of projects X and Y.
b. Compute the risk attached to each project i.e. Standard Deviation of each probability distribution.
c. Which project do you consider more risky and why?
d. Compute the Profitability index of each project. [CA Final May 1999]

Q.2. Big oil is wondering whether to drill for oil in Westchester country. The prospects are as follows.

Depth of Well Feets	Total Cost $ in millions	Cumulative probability of finding oil	PV of Oil(if found) $ in millions
2000	4	0.5	10
4000	5	0.6	9
6000	6	0.7	8

Draw a decision tree showing successive drilling decisions to be made by big oil. How deep should it be prepared to drill? [CA Final Nov 2000]

Q.3. A project with an initial outflow of ₹ 1,00,000 has a four year life and a 10% discount rate. The annual cash inflow is ₹ 40,000.
(i) Compute NPV (ii) Measure sensitivity of the project to size, cash flow, life & discount factor.

Q.4.

Initial Investment = Rs.1,15,000

Annual Cash Flows	Probability
Rs.30,000	0.60
Rs.20,000	040

Life Years – 5 years
Terminal Cash Flows – Rs.18,000
Rate – 10%

BONDS VALUATION

Q.1. Tata Power –
Remaining Life – 4 Years
Coupon Rate – 12%
Face value – Rs. 1000
Market Price – Rs. 1240

Convertible into 15 Shares of the Company, currently trading @ Rs.75 a piece.

Req. rate of Return on similar Risky Bond is 11%

Calculate:
- Conversion Ratio
- Conversion Value
- Conversion Premium
- Floor Value
- % of Downside Risk
- Conversion Parity Price
- Favourable income Differential
- Premium Payback Period

Q.2. Tata Power –Mr. A will need ₹ 1,00,000 after two years for which he wants to make one time necessary investment now. He has a choice of two types of bonds. Their details are as below:

	Bond X	**Bond Y**
Face Value	₹ 1,000	₹ 1,000
Coupon	7% payable annually	8% payable annually
Years to maturity	1	4
Current Price	₹ 972.73	₹ 936.52
Current Yield	10%	10%

Advice Mr. A whether he should invest all his money in one type of bond or he should buy both the bonds and, if so, in which quantity?

Assume that there will not be any call risk or default risk.

Q.3. 7% ₹ 100 face value debentures issued at 7.5% discount and redeemable at par after 3 years. Calculate Duration of the Bond & its volatility

MUTUAL FUNDS

Q.1. On 1-4-2012 ABC Mutual Fund issued 20 lakh units at ₹ 10 per unit. Relevant initial expenses involved were ₹ 12 lakhs. It invested the fund so raised in capital market instruments to build a portfolio of ₹ 185 lakhs. During the month of April 2012 it disposed off some of the instruments costing ₹ 60 lakhs for ₹ 63 lakhs and used the proceeds in purchasing securities for ₹ 56 lakhs. Fund management expenses for the month of April 2012 was ₹ 8 lakhs of which 10% was in arrears. In April 2012 the fund earned dividends amounting to ₹ 2 lakhs and it distributed 80% of the realized earnings. On 30-4-2012 the market value of the portfolio was ₹ 198 lakhs.

Mr. Akash, an investor, subscribed to 100 units on 1-4-2012 and disposed off the same at closing NAV on 30-4-2012. What was his annual rate of earning?

[(8 Marks), CA Final May 2013]

Q.2. There are two Mutual Funds viz. D Mutual Fund Ltd. and K Mutual Fund Ltd. Each having close ended equity schemes.

NAV as on 31-12-2014 of equity schemes of D Mutual Fund Ltd. is ₹ 70.71 (consisting 99% equity and remaining cash balance) and that of K Mutual Fund Ltd. is ₹ 62.50 (consisting 96% equity and balance in cash).

Following is the other information:

Particulars	Equity Schemes	
	D Mutual Fund Ltd.	K Mutual Fund Ltd.
Sharpe Ratio	2	3.3
Treynor Ratio	15	15
Standard Deviation	11.25	5

There is no change in portfolios during the next month and annual average cost is ₹ 3 per unit for the schemes of both the Mutual Funds.

If Share Market goes down by 5% within a month, calculate expected NAV after a month for the schemes of both the Mutual Funds.

For calculation, consider 12 months in a year and ignore number of days for particular month.

[(8 Marks), CA Final May 2015]