SUGGESTED ANSWERS FOR CA FINAL NOV 2009 MAFA

Question 1(a)

From the following details relating to a project, analyze the sensitivity of the project to changes in initial project cost, annual cash inflow and cost of capital:

Initial Project Cost (Rs.)	1,20,000
Annual Cash Inflow (Rs.)	45,000
Project Life (Years)	4
Cost of Capital	10%

To which of the three factors, the project is most sensitive? (Use annuity factors: for 10% ... 3.169 and 11% ... 3.109). (10 marks)

Answer 1(a)

Calculation of Net present Value

NPV = Present value of inflows — Present value of outflows

= 45000 × 3.169 — 120000

= Rs.22605

Sensitivity Analysis: Sensitivity of a project can be judged by setting NPA zero.

1) Sensitivity with respect to Initial project cost: Rs.22605 / Rs. 120000 = 18.84%
2) Sensitivity with respect to Annual Cash Flows:
   Let us assume that NPV will be zero at "A" annual cash flow.
   A × 3.169-120000 = 0
   A = 120000/3.169
   A = 37867

   Therefore tolerable change in Annual Cash flows is Rs.45000-Rs.37867 = Rs.7133
   Percentage change = 7133/45000 = 15.85%

3) Sensitivity with respect to cost of capital:
   Let us assume that NPV will be zero at "r" cost of capital.
   45000 × PVAF(r%,4) - 120000 = 0
   PVAF(r%,4) = 2.667
   By trial & error & Interpolation we get r = 18.45%

   Percentage change = 8.45% / 10% = 84.5%

Looking at the above answers we can say that annual cash flows are most sensitive because it cannot tolerate a change more than 15 .85%

Question 1(b): ABC Company is considering acquisition of XYZ Ltd. which has 1.5 crores shares outstanding and issued. The market price per share is Rs. 400 at present. ABC's average cost of capital is 12%. Available information from XYZ indicates its expected cash accruals for the next 3 years as follows:

Year	Rs. Cr.
1	250
2	300

3	400

Calculate the range of valuation that ABC has to consider. (PV factors at 12% for years 1 to 3 respectively: 0.893, 0.797 and 0.712). (4 marks)

Answer 1(b)

Valuation on the basis of present value of cash flow:

Year	Rs. Cr.	PVF @ 12%	PV
1	250	0.893	223.25
2	300	0.797	239.1
3	400	0.712	284.8
			747.15

Valuation on the basis of Market price:
Rs.400 × 1.5 cr. = Rs.600 cr.

ABC can buy xyz between a total value of Rs.600 cr. to Rs.747cr.

Question 2(a)

New Projects Ltd. is evaluating 3 projects, P-I, P-Il, P-Ill. Following information 10 is available in respect of these projects:

	P-I	P II	P-III
Cost Rs. 15,00,000		Rs. 11,00,000	Rs. 19,00,000
Inflows—Year 1	6,00,000	6,00,000	4,00,000
Year 2	6,00,000	4,00,000	6,00,000
Year 3	6,00,000	5,00,000	8,00,000
Year 4	6,00,000	2,00,000	12,00,000
Risk Index	1.80	1.00	0.60

Minimum required rate of return of the firm is 15% and applicable tax rate is 40%. The risk free interest rate is 10%. Required:

(i) Find out the risk-adjusted discount rate (RADR) for these projects.
(ii) Which project is the best? (10 marks)

Answer 2(a)

Discounting Rate = Risk free rate + (Minimum required rate of return-Risk free Rate) × Risk Index

Project P-I 10%+(15%-10%) 1.8 =
Project P-II 10%+(15%-10%) 1.0 = 15%
Project P-III 10%+(15%-10%) 0.6 = 13%

Calculation of NPV

Year	Project			Present Value		
	I	II	III	I(19)	II(15)	III (13)
0	-1500000	-1100000	-1900000	-15,00,000	-11,00,000	-19,00,000
1	600000	600000	400000	5,04,202	5,21,739	3,53,982
2	600000	400000	600000	4,23,699	3,02,457	4,69,888

3	600000	500000	800000	3,56,049	3,28,758	5,54,440
4	600000	200000	1200000	2,99,201	1,14,351	7,35,982
		NPV		83,151	1,67,305	2,14,293

Decision: Project P-III is the best because it has highest NPV.

Answers Question 2(b)

The following data relate to Anand Ltd.'s share price

Current price per share Rs. 1,800

6 months future's price / share Rs. 1,950

Assuming it is possible to borrow money in the market for transactions in securities at 12% per annum, you are required

(i) to calculate the theoretical minimum price of a 6-months forward purchase; and

(ii) to explain arbitrating opportunity. (6 marks)

Answer 2(b)

Calculation of Idea I future price: = Spot Price × $(1+r)_n$

= 1800 × 1.06 (interest is assumed compounded half yearly)

= 1908

Arbitrage Process:

Particulars	Today	Maturity Date	
		1500	2000
Buy Share in Cash Market	-1800	1500	2000
Borrow money @12% p.a.	1800	-1908	-1908
Short 6 month's future @1950	-	450	-50
Net	0	42	42

(In the above calculation two expected prices of Rs.1500 and Rs.2000 have been taken to prove the risk free position of arbitrage)

Question 2(c)

Saranam Ltd. has issued convertible debentures with coupon rate 12%. Each debenture has an option to convert to 20 equity shares at any time until the date of maturity. Debentures will be redeemed at Rs. 100 on maturity of 5 years. An investor generally requires a rate of return of 8% p.a. on a 5-year security. As an investor when will you exercise conversion for given market prices of the quity share of (i) Rs. 4, (ii) Rs. 5 and (iii) Rs. 6. (4 marks)

Cumulative PV factor for 8% for 5 years : 3.993

PV factor for 8% for year 5 : 0.681

Answer 2(c)

If the bond is not converted, it can be valued as follows:

Year	Amount	PVF @ 8%	PV
1-5	12	3.993	47.92
5	100	0.681	68.10
		Value of Bond	116.02

If Bond is converted, it can take following values:

(i) Rs.4 Value = 20 × 4 = Rs.80

(ii) Rs.5 Value = 20 × 5 = Rs.100

(iii) Rs.6 Value = 20 × 6 = Rs.120

Conclusion: It means investor will prefer to convert the bond only if market price per share is Rs.6 because in that case shares will have a value of Rs.120 while bond has a value of Rs.116 only.

Question 3(a)

Mr. Sinha has invested in three Mutual fund schemes as per details below:

	Scheme X	Scheme Y	Scheme Z
Date of Investment	01.12.2008	01.01.2009	01.03.2009
Amount of Investment	Rs. 5,00,000	Rs.1,00,000	Rs. 50,000
Net Asset value at entry date	Rs. 10.50	Rs. 10.00	Rs.10.00
Dividend received upto 31.03.2009	Rs.9,500	Rs. 1,500	Nil
Nav as at 3 1.3.2009	Rs. 10.40	Rs. 10.10	Rs. 9.80

You are required to calculate the effective yield on per annual basis in respect of each of the three schemes to Mr. Sinha upto 31.03.2009. (6 marks)

Answer 3(a)

$$\text{Annual Yield} = \frac{\text{Price at the end + Dividend for the year}}{\text{Price at the beginning}} - 1 \cdot \frac{365}{\text{Holding Period}}$$

Scheme X

No. of units = Rs.5,00,000/10.5 = 47619.05

Dividend per unit = 9500/47619.05 = 0.1995

$$\text{Yield} = \frac{10.4 + 0.1995}{10.50} - 1 \cdot \frac{365}{120} = 2.88\%$$

Scheme Y

No. of units = Rs.1,00,000/10 = 10000

Dividend per unit = 1500/10000 = 0.15

$$\text{Yield} = \frac{10.1 + 0.15}{10} - 1 \cdot \frac{365}{89} = 10.25\%$$

Scheme Z

$$\text{Yield} = \frac{9.8 + 0}{10} - 1 \cdot \frac{365}{30} = 24.33\%$$

Question 3(b)

Classic Finance, a Leasing Company, has been approached by A prospective customer intending to acquire a machine whose cash down price is Rs. 6 crores. The customer, in order to leverage his tax position, has requested a quote for a three year lease with rentals payable at the end of each year but in a diminishing manner such that they are in the ratio of 3: 2: 1. Depreciation can be assumed to be on WDV basis at 25% and classic finance's marginal tax rate is 35%. The target rate of return for classic finance on the transaction is 10%. You are required to calculate the lease rents to be quoted for the lease for three years. (8 marks)

Answer 3(b)

Classic Finance Limited should quote a lease rent at which NPV of cash flows discounted @10% is zero.

Step 1: Cash flow for Cost of Asset: -6,00 Lakhs

Step 2: Cash flows for after tax lease rent: (let us assume that lease rent for first, second & third year are respectively 3 χ , 2 χ and χ

Present Value = (3 χ × 0.909 + 2 χ × 0.826 + 3 χ × 0.751) × 0.65 = 3.33546 χ

Step 3: Cash flow for tax benefit on depreciation:

Year	Depreciation @ 25%	Tax Benefit @ 35%	PVF @ 1O%	PV
1	150.00	52.500	0.909	47.727
2	112.00	39.375	0.826	32.541
3	84.375	29.531	0.751	22.187
				102.456

Step 4: Cash flow for tax benefit on capital loss:

Written down Value at the end of 3rd year = Capital Loss = 253.125

Tax Benefit = 253.125 × 35% = 88.594

Present Value = 88.594 × 0.751 = 66.534

Step 5: Calculation of lease rent:

-600.000 + 3.33546 χ + 102.456 + 66.534 = 0

By Solving χ = Rs. 129.221

Rent for Year 1 129.221 × 3 = 387.663 lakhs
Year 2 129.221 × 2 = 258.442 lakhs
Year.3 129.221 × 1 = 129.221 lakhs

Question 4 (a)

B Ltd. is a highly successful company and wishes to expand by acquiring other firms. Its expected high growth in earnings and dividends is reflected in its PE ratio of 17. The Board of Directors of B Ltd. has been advised that if it were to take over firms with a lower PE ratio than it own, using a share-for-share exchange, then it could increase its reported earnings per share. C Ltd. has been suggested as a possible target for a takeover, which has a PE ratio of 10 and 1,00,000 shares in issue with a share price of Rs.15. B Ltd. has 5,00,000 shares in issue with a share price of Rs.12. Calculate the change in earnings per share of B Ltd. it acquires the whole of C Ltd. by issuing shares at its market price of Rs.12. Assume the price of B Ltd. shares remains constant. (8 marks)

Answer 4(a)

Particulars	B Ltd.	C Ltd.
Market Price Per Share	12	15
Price Earning Ratio	17	10
EPS = MPS/PE Ratio	0.7059	1.5
x No. of shares	500000	100000
Earnings available to equity shareholder	352941	150000

Share Exchange ratio = Market price of Target co./ Market price of acquiring co.
= 15/12
= 1.25

Post Merger EPS = (352941 + 150000)/(500000 + l00000xl.25)
= 502941/625000

= 0.8047

Change in earnings per share of B Ltd. = Post merger EPS - Pre merger EPS
= 0.8047 - 0.7059 = 0.10

An exporter is a UK based company. Invoice amount is $3,50,000. Credit period is three months. Exchange rates in London are:

Spot Rate ($/£) 1.5865 – 1.5905
3-Months Forward Rate ($/£)1.6100– 1.6140
Rate of Interest in Money Market:

	Deposit	Loan
$	7%	9%
£	5%	8%

Compute and show how a money-market hedge can be put in place. Compare and contrast the outcome with a forward contract. (7 marks)

Answer 4(b)
Money Market Hedge:

1) Borrow: $342298.29 ($,35,0000/1.0225)
2) Convert into pounds : $342298.29 / 1.5905 = £ 215214
3) Invest pounds = £ 215214 × 1.0125 = £ 217904
4) Repay dollar borrowings: $342298.29 x 1.0225 = $350000

Forward Cover: $3,50,000/ 1.6140 = £ 216853

Conclusion: Money market hedge is better than forward cover.

Question 5(a)
XYZ established the following spread on the Delta Corporation's stock:

1. Purchased one 3-month call option for 100 Nos. with a premium of Rs.30 and an exercise price of Rs. 550.
2. Purchased one 3-month put option for 100 Nos. with a premium of Rs.5 and an exercise price of Rs. 450.

The current price of Delta Corporation's stock is Rs. 500. Determine XYZ profit or loss if the price of Delta Corporation:

(i) Stays at Rs.500 after 3 months.
(ii) Falls to Rs.350 after 3 months.
(iii)Rises to Rs.600. (6 marks)

Answer 5(a)
Position created by XYZ is called strangle. Following is the pay off table for this position:

Stock Price	Call @ 550	Put @ 450	Premium Paid	Net Pay-Off
500	-	-	-35	-35
350	-	100	-35	65
600	50	-	-35	15

Question 5(b)

Subhash & Co. earns Rs. 8 per share having capitalisation rate of 10 per cent and has a return on investment at the rate of 20 per cent. According to Walter's model, what should be the price per share at 25 per cent dividend payout ratio. Is this the optimum payout ratio as per Walter? (6 marks)

Answer 5(b)

$$P = \frac{DPS + \frac{r}{K_e}(EPS - DPS)}{K_e}$$

Here r = return on investment

K = Capitalization ratee

In this question DPS = EPS x Payout ratio = 8 × 25% = 2

$$P = \frac{2 + \frac{.20}{.10}(8 - 2)}{0.10} = \text{RS.}140$$

Here we can see that r> Ke. Therefore the best policy will be minimum dividend, say 0%. In that case market price can be calculated as follows:

$$P = \frac{0 + \frac{.20}{.10}(8 - 0)}{0.10} = \text{RS.}160$$

Question 5(C): A stock costing Rs.120 pays no dividends. The possible prices that the stock might sell for at the end of the year with the respective probabilities are: 8

Price	Probability
115	0.1
120	0.1
125	0.2
130	0.3
135	0.2
140	0.1

Required:

(i) Calculate the expected return.

(ii) Calculate the Standard deviation of returns. (8 marks)

Answer 5(C)

Price	Return	Prob.	Ret x Pro.	(Ret - Mean)^2 x Prob
115	-4.17	0.10	-0.42	12.66
120	0.00	0.10	0.00	5.02
125	4.17	0.20	0.83	1.70
130	8.33	0.30	2.50	0.47
135	12.50	0.20	2.50	5.87
140	16.67	0.10	1.67	9.18
			7.08	34.90

(i) Expected Return = 7.08%

(ii) Standard Deviation = $(34.90)^{½}$ 5.91