

Solutions to the May 2010 Strategic Financial Management Exam

Question 1 (a): (Compulsory - 12 marks)

(a) XY Ltd. has under its consideration a project with an initial investment of Rs.1,00,000. Three probable cash inflow scenarios with their probabilities of occurrence have been estimated as below:

Annual cash inflow (Rs.)	20,000	30,000	40,000
Probability	0.1	0.7	0.2

The project life is 5 years and the desired rate of return is 20%. The estimated terminal values for the project assets under the three probability alternatives, respectively, are Rs.0, 20,000 and 30,000.

You are required to:

- (i) Find the probable NPV;
- (ii) Find the worst-case NPV and the best-case NPV; and
- (iii) State the probability occurrence of the worst case, if the cash flows are perfectly positively correlated over time

Solution:

(i) Statement showing probable NPV of XY's project with an initial investment of Rs.100,000

Year	Cash flow working	Cash flow	DF (20%)	Discounted cash flow <i>Amount Rupees</i>
(1)	(2)	(3)	(4)	(5)=(3) x (4)
0	(1,00,000 x 1)	(1,00,000)	1.000	(1,00,000)
1 to 5	(20,000 x 0.1 + 30,000 x 0.7 + 40,000 x 0.2)	31,000	2.991	92,721
5	(0 x 0.1 + 20,000 x 0.7 + 30,000 x 0.2)	20,000	0.402	8,040
Expected NPV				761

(ii) (a) **Worst case NPV:** By inspection we notice that Scenario 1 is the Worst Case scenario; namely the one with lowest cash flows. The details are: probability is 0.1, and annual cash flows are Rs.20,000

Year	Cash flow	Discount factor	Discounted cash flow
(1)	(2)	(3)	(4)=(2) x (3)
0	(1,00,000)	1.000	(1,00,000)
1 to 5	20,000	2.991	59,820
5	0	0.402	0
Worst case NPV			(40,180)

(ii) (b) **Best case NPV:** By inspection we notice that Scenario 3 is the Best Case scenario; namely the one with highest cash flows. The details are: probability is 0.7, and annual cash flows are Rs. 30,000

Year	Cash flow	Discount factor	Discounted cash flow
(1)	(2)	(3)	(4)=(2) x (3)
0	(1,00,000)	1.0000	(1,00,000)
1 to 5	30,000	2.991	89,730
5	20,000	0.402	8,040
Best case NPV			(2,230)

(iii) Probability of occurrence of the worst case, if the cash flows are perfectly positively correlated over time is given as 0.1

Question 1 (b): (Compulsory 4 marks)

Mr. A purchased a 3-month call option for 100 shares in XYZ Ltd. at a premium of Rs.30 per shares, with an exercise price of Rs.550. He also purchased a 3 month put option for 100 shares of the same company at a premium of Rs.5 per share with an exercise price of Rs.450. The market price of the share on the date of Mr. A's purchase of options, is Rs.500. Calculate the profit or loss that Mr. A would make assuming that the market price falls to Rs.350 at the end of 3 months.

Solution:

Mr A will not exercise his Call option since the price in the market at Rs.350 is less than the exercise price in the Call at Rs.550. However, Mr. A will exercise the put option. Option premium paid on both the options would be the cost.

Calculation of profit or loss of Mr. A on option transactions:

<i>Particulars</i>	<i>Amount (Rs.)</i>
a) Sale price under put option (450 x 100)	45,000
b) Market price (350 x 100)	35,000
c) Profit before considering premium cost (a-b)	10,000
d) Premium on put option (5 x 100)	(500)
e) Premium on call option (30 x 100)	(3,000)
f) Net profit (c-d-e)	6,500

Question 1 (c): (Compulsory 4 marks)

Explain briefly, how financial policy is linked to strategic management.

Solution:

Strategic management is closely intertwined with the financial policy of an organization. Following are some core aspects of financial policy, which represent important dimensions of Strategic planning and management:

Source of finance: The generation of funds may arise out of ownership capital or borrowed capital. Again owned capital may be through equity shares or preference shares. Borrowed capital may be debentures, term loan, public deposits etc. Decisions on the identifying the right sources of finance which is appropriate to the organization is a core financial policy decision.

Capital structure: Financial policy decision in this area addresses the issue of desired mix of equity and debt capital. The ideal form differs from industry to industry and within the industry from entity to entity.

Investment and fund allocation: Investment proposals can be to add a new product line, to expand the scale of operations in an existing product line or to bring about cost reduction and efficient utilization of resources. Investment decisions and capital budgeting form the third limb of strategic financial management.

Dividend policy: Financial Policy decisions in this area, is aimed at determining the extent of earnings to be distributed as dividend and the extent of earnings to be retained for future expansion scheme of the firm.

It is seen that dividend decisions will affect retained earnings, and in turn, will affect the capital structure, and funding sources which are the determinants of investment decisions. Each of the financial policy issues is thus, will flow from and yet will have a corollary effect on the other.

Question 2 (a): (Compulsory 10 marks)

P Ltd. has decided to acquire a machine costing Rs.50 lakhs through leasing . Quotations from 2 leasing companies have been obtained which are summarized below:

	<i>Quote A</i>	<i>Quote B</i>
<i>Lease term</i>	<i>3 years</i>	<i>4 years</i>
<i>Initial lease rent (Rs. Lakhs)</i>	<i>5.00</i>	<i>1.00</i>
<i>Annual lease rent (payable in arrears) (Rs. Lakhs)</i>	<i>21.06</i>	<i>19.66</i>

P Ltd. evaluates investment proposals at 10% cost of capital and its effective tax rate is 30%. Terminal payment in both cases is negligible and may be ignored.

Make calculations and show which quote is beneficial to P Ltd. Present value factors at 10% rate for years 1-4 are respectively 0.91, 0.83, 0.75 and 0.68. Calculations may be rounded off to 2 decimals in lakhs.

Solution:**Quote A:**

Year			Discount factor (PVAF) (10%)	Discounted cash flow
(1)			(3)	(2*3)=4
0	Initial flow	5.00	1	5.00
1 to 3	Intermediate flows	21.06	2.49	52.44
	Terminal flow	0	0	0
			Present value	57.44

Quote B:

Year			Discount factor (PVAF) (10%)	Discounted cash flow
(1)			(3)	(2*3)=4
0	Initial flow	1.00	1	1.00
1 to 4	Intermediate flows	19.66	3.17	62.32
	Terminal flow	0	0	0
			Present value	63.32

Evaluation table

As the life of the two quotes is different the decision is to be based on Equated Annual Cost (EAC).

Details	Quote A	Quote B
Present Value	57.44	63.32
PVAF	2.49	3.170
EAC	23.07	19.97

The EAC of Quote B is lower and should hence be selected

Notes: Consideration of tax will not affect the conclusion since the quotes are similar in structure and the tax rates are same. Consequently pretax cost of capital is taken as discount rate.

Question 2 (b): (Compulsory 6 marks)

(b) Based on the following information, determine the NAV of a regular income scheme on per unit basis:

	<i>Rs. Crores</i>
Listed shares at Cost (ex-dividend)	20
Cash in hand	1.23
Bonds and debentures at cost	4.3
Of these, bonds not listed and quoted	1
Other fixed interest securities at cost	4.5
Dividend accrued	0.8
Amount payable on shares	6.32
Expenditure accrued	0.75
Number of units (Rs.10 face value)	20 lacs
Current realizable value of fixed income securities of face value of Rs.100	106.5
The listed shares were purchased when Index was	1,000
Present index is	2,300
Value of listed bonds and debentures at NAV date	8

There has been a diminution of 20% in unlisted bonds and debentures other fixed interest securities are at cost

Solution:

Table showing determination of NAV of a regular income scheme on per unit basis.

Particulars of assets or liabilities at cost	Adjustment	Value Rs. Crores
Equity shares	Index $((2300 / 1000) \times 20)$	46.0000
Cash in hand	Book value	1.2300
Bonds & debentures - unlisted	Adjusted book value $(1 \times (1-20\%))$	0.8000
Bonds & Debentures - listed	Market value	8.0000
Fixed interest securities	Market value $(4.5 \times 106.5 / 100)$	4.7925
Dividend accrued		0.8000
Sub Total (A) Assets		61.6225
Less: Liabilities:		
Amount payable on shares		6.3200
Expenditure accrued	Accrual basis	0.7500
Sub Total (B) Assets		7.0700
Net asset value (A-B)		54.5525
No. of units	Number	20,00,000
Net asset value per unit	Per unit	Rs. 272.76

Question 2 (c): (Compulsory 4 marks)

How is a stock market index calculated? Indicate any two important stock market indices

Solution:**Stock market index calculation:**

Step 1: First we calculate the weightage of each share present in a scrip as:

$$(M\text{-cap}_{it} / \text{Total market cap}) \times 100$$

Where, $M\text{-cap}_{it}$ = market cap of scrip 'i' at time 't'

Total market cap = Sum of the market cap of all scrips present in the index

Market cap = Price of share at time 't' * number of outstanding shares.

t = day of calculation of index

Step 2: Value of index =
$$\sum_{i=1}^n \frac{\{M - \text{cap}_{it} * \text{weight}_{it} (\text{as calculated in step 1})\}}{W_b}$$

Where, W_b = Sum of the market cap of all scrips in the index during the base year

Two important stock market indices are:

(a) BSE SENSEX and (b) S&P CNX NIFTY

Question 3 (a): (Compulsory 12 marks)

The following information is given for 3 companies that are identical except for their capital structure:

	Orange	Grape	Apple
Total invested capital	1,00,000	1,00,000	1,00,000
Debt/assets ratio	0.8	0.5	0.2
Shares outstanding	6,100	8,300	10,000
Pre tax cost of debt	16%	13%	15%
Cost of equity	26%	22%	20%
Operating Income (EBIT)	25,000	25,000	25,000
Net Income	8,970	12,350	14,950

The tax rate is uniform 35% in all cases.

- Compute the Weighted average cost of capital for each company
- Compute the Economic Value Added (EVA) for each company
- Based on the EVA, which company would be considered for best investment? Give reasons
- If the industry PE ratio is 11x, estimate the price for the share of each company
- Calculate the estimated market capitalization for each of the Companies

Solution:

Particulars	Orange	Grape	Apple
a) Proportion of debt (Debt/assets ratio)	0.8	0.5	0.2
b) Proportion of equity [1-a]	0.2	0.5	0.8
c) Pre-tax cost of debt	16%	13%	15%
d) Post-tax cost of debt [c x (1-0.65)] pretax cost adjusted for tax rate at 35%	10.4%	8.45%	9.75%

e) Cost of equity	26%	22%	20%
f) Weighted average cost of capital (WACC) [a x d + b x e]	13.52%	15.23%	17.95%
g) Operating income	25,000	25,000	25,000
h) Net Operating Profit After Taxes (NOPAT) [g x (1-0.35)]	16,250	16,250	16,250
i) Capital x WACC [1,00,000 x f]	13,520	15,230	17,950
j) EVA (=NOPAT – Capital x WACC) [h-i]	2,730	1,020	(1,700)
k) Net income	8,970	12,350	14,950
l) Shares outstanding	6,100	8,300	10,000
m) EPS [k / l]	1.4705	1.4880	1.4950
n) Share price [m x 11(PE multiple)]	16.18	16.37	16.45
o) Market capitalization [l x n]	98,698	1,35,871	1,64,500

Based on EVA, “Orange” company is the best for investment, as it generates the highest and positive EVA. This means that the company generates economic profits, after meeting the return of both debt and equity holders .

Question 3 (b): (Compulsory 4 marks)

The rate of inflation in India is 8% per annum and in the U.S.A. it is 4%. The current spot rate for USD in India is Rs.46. What will be the expected rate after 1 year and after 4 years applying the Purchasing Power Parity Theory.

Solution:

According to purchasing power parity theory,

$$\frac{S_1^e}{S_0} = \frac{1 + i_n}{1 + i_f}$$

Where, $S_1^e S_1^e$ = Expected sport rate after 1 year

$S_0 S_0$ = Current spot rate

$i_n i_n$ = Inflation rate in home country

$i_f i_f$ = Inflation rate in foreign country

Expected rate after 1 year:

$$\frac{S_1^e}{46} = \frac{1 + 0.08}{1 + 0.04} \quad \text{So, } S_1^e S_1^e = \text{Rs. } 47.77$$

Expected rate after 4 year:

$$\frac{S_4^e}{46} = \left(\frac{1 + 0.08}{1 + 0.04} \right)^4 \quad \text{So, } S_4^e S_4^e = \text{Rs. } 53.50$$

Question 3 (c): (Compulsory 4 marks)

List and briefly explain the main functions of an investment bank.

Solution:

Investment banks are mainly concerned with the following activities of corporates:

- Initial Public Offering: Investment banks underwrite public issues, manage public offerings, file documents required by the stock exchanges, help in the marketing phase etc.
- Mergers and acquisitions: This may involve representing the selling firms and finding a potential buyer, or representing the acquirer and finding a potential seller.

- c) Private placement: This involves writing a private placement memorandum, contacting potential strategic or financial buyers of the client etc.
- d) Financial restructuring: This involves securing financing, building projections for the client, renegotiating credit terms with lenders and helping to re-establish the business as a going concern.

Question 4 (a): (Compulsory 16 marks)

T Ltd. and E Ltd. are in the same industry. The former is in negotiation for acquisition of the latter. Important information about the two companies as per their latest financial statements is given below:

	<i>T Ltd.</i>	<i>E Ltd</i>
<i>Rs. 10 Equity shares outstanding</i>	<i>12 lakhs</i>	<i>6 lakhs</i>
<i>Debt:</i>		
<i>10% Debentures (Rs. Lakhs)</i>	<i>580</i>	<i>-</i>
<i>12.5% Institutional Loan (Rs. Lakhs)</i>	<i>-</i>	<i>240</i>
<i>Earnings before interest, depreciation and Tax (EBIDTA) (Rs. Lakhs)</i>	<i>400.86</i>	<i>115.71</i>
<i>Market Price/share (Rs.)</i>	<i>220.00</i>	<i>110.00</i>

T Ltd. plans to offer a price for E Ltd. business as a whole which will be 7 times EBIDTA reduced by outstanding debt, to be discharged by own shares at market price.

E Ltd. is planning to seek one share in T Ltd. for every 2 shares in E Ltd. based on the market price. Tax rate for the two companies may be assumed as 30%.

Calculate and show the following under both alternatives – T Ltd. 's offer and E Ltd's plan:

- (i) Net consideration payable*
- (ii) No. of shares to be issued by T Ltd*
- (iii) EPS of T Ltd. after acquisition*
- (iv) Expected market price per share of T Ltd. after acquisition*
- (v) State briefly the advantages to T Ltd. from the acquisition. Calculations (except EPS) may be rounded off to 2 decimals in lakhs.*

Solution:

Alternative I – T Ltd's offer:

(i) Net consideration:

$$= \text{EBIDTA} \times 7 - \text{Debt}$$

$$= 115.71 \times 7 - 240 = \text{Rs. } 569.97 \text{ lakhs}$$

(ii) No. of shares to be issued by T Ltd:

$$= \text{Net consideration} / \text{Market price per share} = 569.97/220$$

Number of shares to be issued : 2,59,077 (o say 2,59,000 shares)

(iii) EPS of T Ltd after acquisition:

(Rs. lakhs)

Particulars	T Ltd.	E Ltd.	Total
a) EBIDTA	400.86	115.71	516.57
b) Interest (10% of 580 and 12.5% of 240)	58.00	30.00	88.00
c) EBT	342.86	85.71	428.57
d) Tax @ 30%	102.86	25.71	128.57
d) EAT	240.00	60.00	300.00

EPS of T Ltd. before acquisition = EAT / No. of shares = Rs.240 lakhs / 12 lakhs = Rs.20 per share
 EPS after acquisition = Combined EAT / Total no. of shares
 = Rs. 300 lakhs / (12 + 2.59) lakhs shares = Rs.20.56 per share

(iv) Expected market price per share of T Ltd after acquisition

PE ratio of T Ltd before acquisition = Market price per share / Earnings per share
 = 220 / 20 = 11

Note: It has been assumed that PE ratio does not change after acquisition,

Expected market price = EPS after acquisition x PE ratio
 = 20.56 x 11 = Rs.226.16

(v) Advantages to T Ltd. after acquisition

T Ltd's EPS and market price per share has increased after acquisition.

Alternative II – E Ltd's plan:

(i) Net consideration

= No. of shares of E Ltd. x Market price per share of E Ltd.
 = 6 lakhs x 110 = Rs. 660 lakhs

(ii) No. of shares to be issued by T Ltd

= Net consideration / Market price per share
 = Rs. 660 lakhs / Rs.220 = 3 lakhs

(iii) EPS of T Ltd after acquisition

EPS after acquisition = Combined EAT / Total no. of shares
 = Rs. 300 lakhs / (12 + 3) lakhs shares = Rs.20 per share

(iv) Expected market price per share of T Ltd after acquisition

Assuming PE ratio does not change after acquisition,
 Expected market price = EPS after acquisition x PE ratio
 = 20 x 11 = Rs.220

(v) Advantages to T Ltd. after acquisition

T Ltd's EPS and market price per share has remained the same after acquisition. Hence, there no immediate financial advantage is seen; however, there could be synergies arising from amalgamation which could benefit the combined entity in the long run.

Question 4 (b): (Compulsory 4 marks)

Briefly explain what is an exchange traded fund.

Solution:

Exchange Traded Fund:

An Exchange Traded Fund (ETF) is a hybrid product that combines the features of an index fund. These funds are listed on the stock exchanges and their prices are linked to the underlying index. The authorized participants act as market makers for ETFs.

ETFs can be bought and sold like any other stock on an exchange. In other words, ETFs can be bought or sold any time during the market hours at prices that are expected to be closer to the NAV at the end of the day. Therefore, one can invest at real time prices as against the end of the day prices as is the case with open-ended schemes.

There is no paper work involved for investing in an ETF and can be bought by placing an order with a broker. By owning an exchange traded funds, investors get the diversification of an index fund plus the flexibility of a stock.

Question 5 (a): (Compulsory 8 marks)

Consider the following data for Government Securities:

Face Value (Rs.)	Interest Rate %	Maturity (Years)	Current Price (Rs.)
1,00,000	0	1	91,000
1,00,000	10.5	2	99,000
1,00,000	11.0	3	99,500
1,00,000	11.5	4	99,900

Calculate the forward interest rates.

Solution:

Let the forward interest rates for years 1, 2, 3 and 4 be assumed as r_1 , r_2 , r_3 and r_4 respectively.

$$\text{For 1 year security, set } 91000 = \frac{100000}{1+r_1} + \frac{100000}{1+r_1}$$

Solving, $r_1 = 9.890\%$

$$\text{For 2 year security, set } 99000 = \frac{10500}{(1+r_1)} + \frac{110500}{(1+r_1)(1+r_2)} + \frac{10500}{(1+r_1)(1+r_2)}$$

Solving, $r_2 = 12.421\%$

$$\text{For 3 year security, set } 99500 = \frac{11000}{(1+r_1)} + \frac{11000}{(1+r_1)(1+r_2)} + \frac{111000}{(1+r_1)(1+r_2)(1+r_3)}$$

$$\frac{11000}{(1+r_1)} + \frac{11000}{(1+r_1)(1+r_2)} + \frac{111000}{(1+r_1)(1+r_2)(1+r_3)}$$

Solving, $r_3 = 11.500\%$

For 4 year security, set 99900

$$= \frac{11500}{(1+r_1)} + \frac{11500}{(1+r_1)(1+r_2)} + \frac{11500}{(1+r_1)(1+r_2)(1+r_3)} + \frac{111500}{(1+r_1)(1+r_2)(1+r_3)(1+r_4)}$$

$$\frac{11500}{(1+r_1)} + \frac{11500}{(1+r_1)(1+r_2)} + \frac{11500}{(1+r_1)(1+r_2)(1+r_3)} + \frac{111500}{(1+r_1)(1+r_2)(1+r_3)(1+r_4)}$$

Solving, $r_4 = 12.778\%$

Question 5 (b): (Compulsory 8 marks)

The following market data is available:

Spot USD/JPY 116.00

Deposit rates p.a.	USD	JYP
3 months	4.50%	0.25%
6 months	5.00%	0.25%

Forward Rate Agreement (FRA) for YEN is NIL.

1. What should be 3 months FRA rate at 3 months forward?
2. the 6 & 12 months LIBORS are 5% & 6.5% respectively. A bank is quoting 6/12 USD FRA at 6.50 – 6.75%. Is any arbitrage opportunity available?

Calculate profit in such cases.

Solution:

Part 1:

Let $3r_6$ be the 3 month FRA rate at 3 month forward, $0r_3$ and $0r_6$ be current 3 month/6 month rates respectively.

Under no-arbitrage conditions,

$$(1 + 0r_3 \times 3/12)(1 + 3r_6 \times 3/12) = (1 + 0r_6 \times 6/12)$$

Setting $0r_3 = 4.50\%$ p.a. and $0r_6 = 5.00\%$ p.a. and solving,

$$3r_6 = 5.44\% \text{ p.a. (3 months FRA rate at 3 months forward)}$$

Part 2:

Let $6r_{12}$ be the 6 month FRA rate at 6 month forward, $0r_6$ and $0r_{12}$ be current 6 month/12 month LIBOR respectively.

Under no-arbitrage conditions,

$$(1 + 0r_6 \times 6/12)(1 + 6r_{12} \times 6/12) = (1 + 0r_{12} \times 12/12)$$

Setting $0r_6 = 5.00\%$ p.a. and $0r_{12} = 6.50\%$ p.a. and solving,

$$6r_{12} = 7.80\% \text{ p.a. (6 months FRA rate at 6 months forward)}$$

Since bank is quoting $6r_{12}$ at 6.75% (the rate at which it will lend), there is arbitrage opportunity.

Profit that would be gained, assuming a contract amount of 1000 USD = $1000 (7.8\% - 6.75\%)$

$$= 10.5 \text{ USD, which will be received at 6 months from present, under the FRA.}$$

Question 5 (c): (Compulsory 4 marks)

Write a short note on Debt Securitisation.

Solution:

Debt Securitisation:

Debt securitisation is a method of recycling of funds. It is especially beneficial to financial intermediaries to support the lending volumes. Assets generating steady cash flows are packaged together and against this assets pool market securities can be issued. The process can be classified in the following three functions.

1. **The origination function:** A borrower seeks a loan from finance company, bank or housing company. On the basis of credit worthiness repayment schedule is structured over the life of the loan.
2. **The pooling function:** Similar loans or receivables are clubbed together to create an underlying pool of assets. This pool is transferred in favour of a SPV (Special Purpose Vehicle), which acts as a trustee for the investor. Once, the assets are transferred they are held in the organizers portfolios.
3. **The securitisation function:** It is the SPV's job to structure and issue the securities on the basis of asset pool. The securities carry coupon and an expected maturity, which can be asset based or mortgage based. These are generally sold to investors through merchant bankers. The investors interested in this type of securities are generally institutional investors like mutual fund, insurance companies etc. The originator usually keeps the spread.

Generally, the process of securitisation is without recourse i.e. the investor bears the credit risk of default and the issuer is under an obligation to pay to investors only if the cash flows are received by issuer from the collateral.