

PAPER – 2: STRATEGIC FINANCIAL MANAGEMENT

QUESTIONS

Index Futures

1. Mr. Careless was employed with ABC Portfolio Consultants. The work profile of Mr. Careless involves advising the clients about taking position in Future Market to obtain hedge in the position they are holding. Mr. ZZZ, their regular client purchased 100,000 shares of X Inc. at a price of \$22 and sold 50,000 shares of A plc for \$40 each having beta 2. Mr. Careless advised Mr. ZZZ to take short position in Index Future trading at \$1,000 each contract.

Though Mr. Careless noted the name of A plc along with its beta value during discussion with Mr. ZZZ but forgot to record the beta value of X Inc.

On next day Mr. ZZZ closed out his position when:

- Share price of X Inc. dropped by 2%
- Share price of A plc appreciated by 3%
- Index Future dropped by 1.5%

Mr. ZZZ, informed Mr. Careless that he has made a loss of \$114,500 due to the position taken. Since record of Mr. Careless was incomplete he approached you to help him to find the number of contract of Future contract he advised Mr. ZZZ to be short to obtain a complete hedge and beta value of X Inc.

You are required to find these values.

2. Mr. X, is a Senior Portfolio Manager at ABC Asset Management Company. He expects to purchase a portfolio of shares in 90 days. However he is worried about the expected price increase in shares in coming day and to hedge against this potential price increase he decides to take a position on a 90-day forward contract on the Index. The index is currently trading at 2290. Assuming that the continuously compounded dividend yield is 1.75% and risk free rate of interest is 4.16%, you are required to determine:
 - (a) Calculate the justified forward price on this contract.
 - (b) Suppose after 28 days of the purchase of the contract the index value stands at 2450 then determine gain/ loss on the above long position.
 - (c) If at expiration of 90 days the Index Value is 2470 then what will be gain on long position.

Note: Take 365 days in a year and value of $e^{0.005942} = 1.005960$, $e^{0.001849} = 1.001851$.

3. Sensex futures are traded at a multiple of 50. Consider the following quotations of Sensex futures in the 10 trading days during February, 2014:

Day	High	Low	Closing
4-2-14	3306.4	3290.00	3296.50
5-2-14	3298.00	3262.50	3294.40
6-2-14	3256.20	3227.00	3230.40
7-2-14	3233.00	3201.50	3212.30
10-2-14	3281.50	3256.00	3267.50
11-2-14	3283.50	3260.00	3263.80
12-2-14	3315.00	3286.30	3292.00
14-2-14	3315.00	3257.10	3309.30
17-2-14	3278.00	3249.50	3257.80
18-2-14	3118.00	3091.40	3102.60

Abshishek bought one sensex futures contract on February, 04. The average daily absolute change in the value of contract is ₹ 10,000 and standard deviation of these changes is ₹ 2,000. The maintenance margin is 75% of initial margin.

You are required to determine the daily balances in the margin account and payment on margin calls, if any.

Foreign Exchange Risk Management

4. Sun Ltd. is planning to import equipment from Japan at a cost of 3,400 lakh yen. The company may avail loans at 18 percent per annum with which it can import the equipment. The company has also an offer from Osaka branch of an India based bank extending credit of 180 days at 2 percent per annum against opening of an irrecoverable letter of credit.

Additional information:

Present exchange rate ₹100 = 340 yen

180 day's forward rate ₹100 = 345 yen

Commission charges for letter of credit at 2 per cent per 12 months.

Advise the company whether the offer from the foreign branch should be accepted.

5. An exporter requests his bank to extend the forward contract for US\$ 20,000 which is due for maturity on 31st October, 2014, for a further period of 3 months. He agrees to pay the required margin money for such extension of the contract.

Contracted Rate – US\$ 1= ₹ 62.32

The US Dollar quoted on 31-10-2014:-

Spot – 61.5000/61.5200

3 months' Discount -0.93% /0.87%

Margin money from bank's point of view for buying and selling rate is 0.45% and 0.20% respectively.

Compute:

- (i) The cost to the importer in respect of the extension of the forward contract, and
 - (ii) The rate of new forward contract.
6. Columbus Surgicals Inc. is based in US, has recently imported surgical raw materials from the UK and has been invoiced for £ 480,000, payable in 3 months. It has also exported surgical goods to India and France.

The Indian customer has been invoiced for £ 138,000, payable in 3 months, and the French customer has been invoiced for € 590,000, payable in 4 months.

Current spot and forward rates are as follows:

£ / US\$

Spot: 0.9830 – 0.9850

Three months forward: 0.9520 – 0.9545

US\$ / €

Spot: 1.8890 – 1.8920

Four months forward: 1.9510 – 1.9540

Current money market rates are as follows:

UK: 10.0% – 12.0% p.a.

France: 14.0% – 16.0% p.a.

USA: 11.5% – 13.0% p.a.

You as Treasury Manager are required to show how the company can hedge its foreign exchange exposure using Forward markets and Money markets hedge and suggest which the best hedging technique is.

Security Valuation

7. Suppose Mr. A is offered a 10% Convertible Bond (par value ₹ 1,000) which either can be redeemed after 4 years at a premium of 5% or get converted into 25 equity shares currently trading at ₹ 33.50 and expected to grow by 5% each year. You are required to determine the minimum price Mr. A shall be ready to pay for bond if his expected rate of return is 11%.
8. The following data is related to 8.5% Fully Convertible (into Equity shares) Debentures issued by JAC Ltd. at ₹ 1000.

Market Price of Debenture	₹ 900
Conversion Ratio	30
Straight Value of Debenture	₹ 700
Market Price of Equity share on the date of Conversion	₹ 25
Expected Dividend Per Share	₹ 1

You are required to calculate:

- (a) Conversion Value of Debenture
- (b) Market Conversion Price
- (c) Conversion Premium per share
- (d) Ratio of Conversion Premium
- (e) Premium over Straight Value of Debenture
- (f) Favourable income differential per share
- (g) Premium pay back period

Financial Services

9. A Ltd. has an export sale of ₹ 50 crore of which 20% is paid by importers in advance of dispatch and for balance the average collection period is 60 days. However, it has been observed that these payments have been running late by 18 days. The past experience indicates that bad debt losses are 0.6% on Sales. The expenditure incurred for efforts in receivable collection are ₹ 60,00,000 p.a.

So far A Ltd. had no specific arrangements to deal with export receivables, following two proposals are under consideration:

- (i) A non-recourse export factoring agency is ready to buy A Ltd.'s receivables by charging 2% commission. The factor will pay an advance on receivables to the firm at an interest rate of MIBOR + 1.75% after withholding 20% as reserve.
- (ii) Insu Ltd. an insurance company has offered a comprehensive insurance policy at a premium of 0.45% of the sum insured covering 85% of risk of non-payment. A Ltd. can assign its right to a bank in return of an advance of 75% of the value insured at MIBOR+1.50%.

Assuming that MIBOR is 6% and A Ltd. can borrow from its bank at MIBOR+2% by using existing overdraft facility determine the which of the two proposal should be accepted by A Ltd. (1 Year = 360 days).

Capital Rationing

10. JHK Private Ltd. is considering 3 projects (not mutually exclusive) has no cash reserves, but could borrow upto ₹ 60 crore @ of 10% p.a. Though borrowing above this amount is also possible, but it shall be at a much higher rate of interest.

The initial capital outlay required, the NPV and the duration of each of these project is as follows:

	Initial Capital Outlay (₹ Crore)	NPV (₹ Crore)	Duration (Years)
Project X	30.80	5.50	6
Project Y	38.00	7.20	7
Project Z	25.60	6.50	Indefinite

Other information:

1. Cost of capital of JHK is 12%.
2. Applicable tax rate is 30%.
3. All projects are indivisible in nature and cannot be postponed.

You are required to:

- (a) Comment whether given scenario is a case of hard capital rationing or soft capital rationing.
- (b) Which project (or combination thereof) should be accepted if these investment opportunities are likely to be repeated in future also?
- (c) Assuming that these opportunities are not likely to be available in future then and Government is ready to support Project Y on following terms then which projects should be accepted.
 - (i) A cash subsidy of ₹ 7 crore shall be available.
 - (ii) 50% of initial cash outlay shall be available at subsidized rate of 8% and repaid in 8 equal installments payable at the end of each year.

Mergers and Acquisitions

11. M plc and C plc operating in same industry are not experiencing any rapid growth but providing a steady stream of earnings. M plc's management is interested in acquisition of C plc due to its excess plant capacity. Share of C plc is trading in market at £4 each. Other data relating to C plc is as follows:

Particulars	M plc	C plc	Combined Entity
Profit after tax	£4,800,000	£3,000,000	£9,200,000
Residual Net Cash Flow per year	£6,000,000	£4,000,000	£12,000,000
Required return on Equity	12.5%	11.25%	12.00%

Balance Sheet of C plc

Assets	Amount (£)	Liabilities	Amount (£)
Current Assets	27,300,000	Current Liabilities	13,450,000
Other Assets	5,500,000	Long Term Liabilities	11,100,000
Property Plants & Equipments	21,500,000	Reserve & Surplus	24,750,000
		Share Capital	5,000,000
		(5 million common shares @ £1 each)	
	54,300,000		54,300,000

You are required to compute:

- (i) Minimum price per share C plc should accept from M plc.
 - (ii) Maximum price per share M plc shall be willing to offer to C plc.
 - (iii) Floor Value of per share of C plc. Whether it shall play any role in decision for its acquisition by M plc.
12. Hanky Ltd. and Shanky Ltd. operate in the same field, manufacturing newly born babies's clothes. Although Shanky Ltd. also has interests in communication equipments, Hanky Ltd. is planning to take over Shanky Ltd. and the shareholders of Shanky Ltd. do not regard it as a hostile bid.

The following information is available about the two companies.

	Hanky Ltd.	Shanky Ltd.
Current earnings	₹ 6,50,00,000	₹ 2,40,00,000
Number of shares	50,00,000	15,00,000
Percentage of retained earnings	20%	80%
Return on new investment	15%	15%
Return required by equity shareholders	21%	24%

Dividends have just been paid and the retained earnings have already been reinvested in new projects. Hanky Ltd. plans to adopt a policy of retaining 35% of earnings after the takeover and expects to achieve a 17% return on new investment.

Saving due to economies of scale are expected to be ₹ 85,00,000 per annum.

Required return to equity shareholders will fall to 20% due to portfolio effects.

Requirements

- (a) Calculate the existing share prices of Hanky Ltd. and Shanky Ltd.
 - (b) Find the value of Hanky Ltd. after the takeover
 - (c) Advise Hanky Ltd. on the maximum amount it should pay for Shanky Ltd.
13. A Ltd. (Acquirer company's) equity capital is ₹ 2,00,00,000. Both A Ltd. and T Ltd. (Target Company) have arrived at an understanding to maintain debt equity ratio at 0.30 : 1 of the merged company. Pre-merger debt outstanding of A Ltd. stood at ₹ 20,00,000 and T Ltd at ₹ 10,00,000 and marketable securities of both companies stood at ₹ 40,00,000.

You are required to determine whether liquidity of merged company shall remain comfortable if A Ltd. acquires T Ltd. against cash payment at mutually agreed price of ₹ 65,00,000.

International Capital Budgeting

14. XY Limited is engaged in large retail business in India. It is contemplating for expansion into a country of Africa by acquiring a group of stores having the same line of operation as that of India.

The exchange rate for the currency of the proposed African country is extremely volatile. Rate of inflation is presently 40% a year. Inflation in India is currently 10% a year. Management of XY Limited expects these rates likely to continue for the foreseeable future.

Estimated projected cash flows, in real terms, in India as well as African country for the first three years of the project are as follows:

	Year – 0	Year – 1	Year – 2	Year - 3
Cashflows in Indian ₹ (000)	-50,000	-1,500	-2,000	-2,500
Cash flows in African Rands (000)	-2,00,000	+60,000	+80,000	+1,00,000

It evaluates all investments using nominal cash flows and a nominal discounting rate. The present exchange rate is African Rand 6 to ₹ 1.

You are required to calculate the net present value of the proposed investment considering the following:

- African Rand cash flows are converted into rupees and discounted at a risk adjusted rate.
- All cash flows for these projects will be discounted at a rate of 20% to reflect it's high risk.
- Ignore taxation.

	Year - 1	Year - 2	Year - 3
PVIF @ 20%	.833	.694	.579

Portfolio Management

15. Following data is related to Company X, Market Index and Treasury Bonds for the current year and last 4 years:

Year	Company X		Market Index		Return on Treasury Bonds
	Average Share Price (P)	Dividend Per Share (D)	Average Market Index	Market Dividend Yield	
2010	₹ 139	₹ 7.00	1300	3%	7%
2011	₹ 147	₹ 8.50	1495	5%	9%
2012	₹ 163	₹ 9.00	1520	5.5%	8%

2013	₹ 179	₹ 9.50	1640	4.75%	8%
2014 (Current Year)	₹ 203.51	₹ 10.00	1768	5.5%	8%

With the above data estimate the beta of Company X's share.

16. The rates of return on the security of Company X and market portfolio for 10 periods are given below:

Period	Return of Security X (%)	Return on Market Portfolio (%)
1	20	22
2	22	20
3	25	18
4	21	16
5	18	20
6	-5	8
7	17	-6
8	19	5
9	-7	6
10	20	11

- (i) What is the beta of Security X?
(ii) What is the characteristic line for Security X?

Economic Value Added

17. ABC Ltd. has divisions A,B & C. The division C has recently reported on annual operating profit of ₹ 20,20,00,000. This figure arrived at after charging ₹ 3 crores full cost of advertisement expenditure for launching a new product. The benefits of this expenditure is expected to be lasted for 3 years.

The cost of capital of division C is ₹11% and cost of debt is 8%.

The Net Assets (Invested Capital) of Division C as per latest Balance Sheet is ₹ 60 crore, but replacement cost of these assets is estimated at ₹84 crore.

You are required to compute EVA of the Division C.

Equity Beta

18. The total market value of the equity share of O.R.E. Company is ₹ 60,00,000 and the total value of the debt is ₹ 40,00,000. The treasurer estimate that the beta of the stock is currently 1.5 and that the expected risk premium on the market is 10 per cent. The Treasury bill rate is 8 per cent.

Required:

- (1) What is the beta of the Company's existing portfolio of assets?
- (2) Estimate the Company's Cost of capital and the discount rate for an expansion of the company's present business.

Venture Capital Financing

19. TMC is a venture capital financier. It received a proposal for financing requiring an investment of ₹45 crore which returns ₹600 crore after 6 years if succeeds. However, it may be possible that the project may fail at any time during the six years.

The following table provide the estimates of probabilities of the failure of the projects.

Year	1	2	3	4	5	6
Probability of Failure	0.28	0.25	0.22	0.18	0.18	0.10

In the above table the probability that the project fails in the second year is given that it has survived throughout year 1. Similarly for year 2 and so forth.

TMC is considering an equity investment in the project. The beta of this type of project is 7. The market return and risk free rate of return are 8% and 6% respectively. You are required to compute the expected NPV of the venture capital project and advice the TMC.

20. Write a short note on
- (a) Arbitrage Pricing Theory
 - (b) Conglomerate Merger
 - (c) Takeover Strategies
 - (d) Factors affecting investment decision in portfolio management
 - (e) Role of Investment Banks in Private Placement

SUGGESTED ANSWERS/HINTS

1. Let the number of contract in Index future be y and Beta of X Inc. be x . Then,

$$\frac{100,000 \times 22 \times x - 50,000 \times 40 \times 2}{1,000} = -y^*$$

* Negative (-) sign indicates the sale (short) position

$$2,200,000x - 4,000,000 = -1,000y$$

Cash Outlay (Outflow)

Purchase of 100,000 shares of X Inc. at a price of \$22 (100,000 × 22)	2,200,000
Sale of 50,000 shares of A plc for \$40 (50,000 × 40)	– 2,000,000

Short Position in Index Futures (1,000 × y)	-1,000y*
Net	200,000 – 1,000y

* Negative (-) sign indicates the indicates inflow due to sale (short) position

Cash Inflow

Sale of 100,000 shares of X Inc. (100,000 × 22 × 0.98)	2,156,000
Purchase of 50,000 shares of A plc (50,000 × 40 × 1.03)	– 2,060,000
Long Position in Index Futures (1,000 × y × 0.985)	-985y
Net	96,000 – 985y

* Negative (-) sign indicates the indicates outflow due to purchase (long) position

Position on Close Out

$$(200,000 - 1,000y) - (96,000 - 985y) = 114,500$$

$$y = -700$$

Thus number of future contract short is 700

Beta of X Inc. can be calculated as follows:

$$2,200,000x - 4,000,000 = -1000 \times 700$$

$$2,200,000x = 3,300,000$$

$$x = 1.5$$

Thus Beta of X Inc. shall be 1.5

2. (a) The Forward Price shall be $= S_0 e^{n(r-y)}$

Where

S_0 = Spot price

n = period

r = risk free rate of interest

y = dividend yield

Accordingly,

$$\text{Forward Price} = 2290 e^{90/365(0.0416 - 0.0175)}$$

$$= 2290 e^{0.005942}$$

$$= 2290(1.005960)$$

$$= 2303.65$$

- (b) Gain/loss on Long Position after 28 days

$$= 2450 - 2290 e^{28/365(0.0416 - 0.0175)}$$

$$\begin{aligned}
 &= 2450 - 2290 e^{0.001849} \\
 &= 2450 - 2290(1.001851) \\
 &= 2450 - 2294.24 \\
 &= 155.76
 \end{aligned}$$

(c) Gain/loss on Long Position at maturity

$$\begin{aligned}
 &= S_n - S_0 e^{n(r-y)} \\
 &= 2470.00 - 2303.65 = 166.35
 \end{aligned}$$

3. Initial Margin = $\mu + 3\sigma$

Where μ = Daily Absolute Change

σ = Standard Deviation

Accordingly

Initial Margin = ₹ 10,000 + ₹ 6,000 = ₹ 16,000

Maintenance margin = ₹ 16,000 x 0.75 = ₹ 12,000

Day	Changes in future Values (₹)	Margin A/c (₹)	Call Money (₹)
4/2/14	-	16000	-
5/2/14	50 x (3294.40 - 3296.50) = -105	15895	-
6/2/14	50 x (3230.40 - 3294.40) = -3200	12695	-
7/2/14	50 x (3212.30 - 3230.40) = -905	16000	4210
10/2/14	50x(3267.50 - 3212.30) = 2760	18760	-
11/2/14	50x(3263.80 - 3267.50) = -185	18575	-
12/2/14	50x(3292 - 3263.80) = 1410	19985	-
14/2/14	50x(3309.30 - 3292) = 865	20850	-
17/2/14	50x(3257.80 - 3309.30) = -2575	18275	-
18/2/14	50x(3102.60 - 3257.80) = -7760	16000	5485

4. (1) Workings-

Option I (To finance the purchases by availing loan at 18% per annum):

Cost of equipment	₹ in lakhs
3400 lakh yen at ₹100 = 340 yen	1,000.00
Add: Interest at 18% (on ₹1000 lakhs) for 6 months	<u>90.00</u>
Total outflow in Rupees	<u>1,090.00</u>

Option II (To accept the offer from foreign branch):

Cost of letter of credit	₹ in lakhs
At 1 % on 3400 lakhs yen at ₹100 = 340 yen	10.00
Add: Interest	<u>0.90</u>
(A)	<u>10.90</u>

Payment at the end of 180 days:

Cost	3400.00 lakhs yen
Interest at 2% p.a. $[3400 \times 2/100 \times 180/365]$	<u>33.53</u> lakhs yen
	<u>3433.53</u> lakhs yen

Conversion at ₹100 = 345 yen $[3433.53 / 345 \times 100]$ (B) = ₹995.23 lakhs

Total Cost: (A) + (B) = 1006.13 lakhs

Advise: Option 2 is cheaper by $(1090.00 - 1006.13)$ lakh or 83.87 lakh. Hence, the offer may be accepted.

5. (i) The contract is to be cancelled on 31-10-2014 at the spot selling rate of US\$ 1 = ₹ 61.5200

Add: Margin Money 0.20% = ₹ 0.1230
= ₹ 61.6430 or ₹ 61.64

US\$ 20,000 @ ₹ 61.64 = ₹ 12,32,800

US\$ 20,000 @ ₹ 62.32 = ₹ 12,46,400

The difference in favour of the Customer = ₹ 13,600

- (ii) The Rate of New Forward Contract

Spot Selling Rate US\$ 1 = ₹ 61.5000

Less: Discount @ 0.93% = ₹ 0.5720

= ₹ 60.9280

Less: Margin Money 0.45% = ₹ 0.2742

= ₹ 60.6538 or ₹ 60.65

6. £ Exposure

Since Columbus has a £ receipt (£ 138,000) and payment of (£ 480,000) maturing at the same time i.e. 3 months, it can match them against each other leaving a net liability of £ 342,000 to be hedged.

- (i) Forward market hedge

Buy 3 months' forward contract accordingly, amount payable after 3 months will be

£ 342,000 / 0.9520 = US\$ 359,244

(ii) Money market hedge

To pay £ after 3 months' Columbus shall requires to borrow in US\$ and translate to £ and then deposit in £.

For payment of £ 342,000 in 3 months (@2.5% interest) amount required to be deposited now

$$(\text{£ } 342,000 \div 1.025) = \text{£ } 333,658$$

With spot rate of 0.9830 the US\$ loan needed will be = US\$ 339,429.

Loan repayable after 3 months @3.25% interest

$$[\$339,429 (1+0.0325)] \text{ will be } = \text{US\$ } 350,460.$$

In this case the money market hedge is a cheaper option.

€ Receipt

$$\text{Amount to be hedged} = \text{€ } 590,000$$

Now we Convert exchange rates to home currency

$$4 \text{ months forward } 1.9510 - 1.9540$$

(i) Forward market hedge

Sell 4 months' forward contract accordingly, amount receivable after 4 months will be

$$(\text{€ } 590,000 \times 1.9510) = \text{US\$ } 1,151,090$$

(ii) Money market hedge

For money market hedge Columbus shall borrow in € and then translate to US\$ and deposit in US\$

For receipt of € 590,000 in 4 months (@ 5.33% interest) amount required to be borrowed now

$$(\text{€ } 590,000 \div 1.0533) = \text{€ } 560,144$$

With spot rate of 0.5294 the US\$ deposit will be = US\$ 1,058,073

deposit amount will increase over 3 months (@3.83% interest) will be $[\$1058073 \times 1.0383]$ = US\$ 1,098,597

In this case, more will be received in US\$ under the forward hedge.

7. First we shall find the Conversion Value of Bond

$$CV = C (1+g)^n \times R$$

Where:

C = Current Market Price

g = Growth Rate of Price

R = Conversion Ratio

n = No. of years

Accordingly, CV shall be

$$= ₹ 33.50 \times 1.05^4 \times 25 = ₹ 33.50 \times 1.2155 \times 25 = ₹ 1017.98$$

Value of Bond if Conversion is opted = ₹ 100 × PVAF (11%, 4) + ₹ 1017.98 PVF (11%, 4)

$$= ₹ 100 \times 3.102 + ₹ 1017.98 \times 0.659$$

$$= ₹ 310.20 + ₹ 670.85 = ₹ 981.05$$

Since above value of Bond is based on the expectation of growth in market price which may or may not as per expectations. In such circumstances the redemption at premium still shall be guaranteed and bond may be purchased at its floor value computed as follows:

Value of Bond if Redemption is opted = ₹ 100 × PVAF (11%, 4) + ₹ 1050 PVF (11%, 4)

$$= ₹ 100 \times 3.102 + ₹ 1050 \times 0.659$$

$$= ₹ 310.20 + ₹ 691.95 = ₹ 1002.15$$

8. (a) Conversion Value of Debenture

= Market Price of one Equity Share X Conversion Ratio

$$= ₹ 25 \times 30 = ₹ 750$$

(b) Market Conversion Price

$$= \frac{\text{Market Price of Convertible Debenture}}{\text{Conversion Ratio}} = \frac{₹ 900}{30} = ₹ 30$$

(c) Conversion Premium per share

Market Conversion Price – Market Price of Equity Share

$$= ₹ 30 - ₹ 25 = ₹ 5$$

$$* \left(\frac{₹ 900}{30} = ₹ 30 \right)$$

(d) Ratio of Conversion Premium

$$= \frac{\text{Conversion premium per share}}{\text{Market Price of Equity Share}} = \frac{₹ 5}{₹ 25} = 20\%$$

(e) Premium over Straight Value of Debenture

$$= \frac{\text{Market Price of Convertible Bond}}{\text{Straight Value of Bond}} - 1 = \frac{₹ 900}{₹ 700} - 1 = 28.6\%$$

(g) Favourable income differential per share

$$\frac{\text{Coupon Interest from Debenture} - \text{Conversion Ratio} \times \text{Dividend Per Share}}{\text{Conversion Ratio}}$$

$$\frac{\text{₹85} - 30 \times \text{₹1}}{30} = \text{₹1.833}$$

(h) Premium pay back period

$$= \frac{\text{Conversion premium per share}}{\text{Favourable Income Differential Per Share}} = \frac{\text{₹5}}{\text{₹1.833}} = 2.73 \text{ years}$$

9. Working Notes:

Total Annual Export Sales	₹ 50 crore
Cash Received in Advance (20%)	<u>₹ 10 crore</u>
Balance on 60 days credit (80%)	<u>₹ 40 crore</u>
Bad Debts 0.6% x ₹ 40 crore	₹ 0.24 crore
Average Export Debtors ₹ 40 crore x $\frac{78}{360}$	₹ 8.67 crore

Proposal I – Factoring Services

Due to non-recourse factoring agreement there will be saving of bad debt. A Ltd. can choose one option out of these options:

- (a) Using Factoring Services (Debt Collection) only.
- (b) Using Factoring and Finance Services i.e. above services in combination of cash advance.

Since, cash advance rate is lower by 0.25% (2.00% - 1.75%), A Ltd. should take advantage of the same.

Particulars	Amount (₹)
Annual Factoring Commission (2% x ₹ 40 crore)	(0.80 crore)
Saving of Administrative Cost	0.60 crore
Saving of Bad Debts	0.24 crore
Interest Saving on 80% of Debtors (₹ 8.67 crore x 80% x 0.25%)	0.01734 crore
Net Saving to A Ltd.	0.05734 crore

Proposal II – Insurance of Receivables

Particulars	Amount (₹)
Insurance Premium (0.45% x ₹ 40 crore)	(0.180 crore)
Saving of Bad Debts (85% x ₹ 0.24 crore)	0.204 crore
Interest Saving on 75% of Debtors (0.5% x 75% x ₹ 8.67 crore)	0.03251 crore
Net Saving to A Ltd.	0.05651 crore

Since saving in Factoring is marginally higher it should be accepted.

10. (a) Hard Capital Rationing is a situation is due to factors external to the organisation. In other words It implies a situation where in an entity could not raise funds beyond a certain point due to external circumstances. On the contrary, when an entity is unable to raise funds beyond a certain limits due to reasons internal to the organization is the case of Soft Capital Rationing. These limitations may be due to any reason such as budgetary ceiling, difficulty in planning and control etc. Since in the given case the limitation of loan upto ₹ 30 crore is due to unwillingness to take loan at expensive rate, it will be a case of Soft Capital Rationing.

(b) Computation of Equivalent Annuities

	Project X	Project Y	Project Z
NPV (₹ Crore) (1)	5.50	7.20	6.50
Duration (2)	6 years	7 years	Indefinite
PVAF@12% (3)	4.111	4.564	8.33
Equivalent Cash Inflow (₹ Crore) [(1)/(3)]	1.34	1.58	0.780
Ranking	II	I	III

Since equivalent cash inflow is maximum in case of Project Y, same should be accepted.

- (c) If the projects are not repeated in the future it shall be decided on the basis of NPV as follows:

Combinations	Initial Investments (₹ Crore)	NPV (₹ Crore)	Possible/Not Possible	Ranking
X	30.80	5.50	Possible	IV
Y	38.00	7.20	Possible	II
Z	25.60	6.50	Possible	III
XY	30.80+38.00 = 68.80	12.70	Not Possible	-
YZ	38.00+25.60 = 63.60	13.70	Not Possible	-
XZ	30.80+25.60 = 56.40	12.00	Possible	I

Thus combination XZ should be accepted as it results in maximum NPV.

Now let us consider the aspect of Government support to evaluate the project Y using Adjusted Present Value (APV) approach as follows:

- Base NPV = ₹ 7.20 Crore + ₹ 7 crore = ₹ 14.20 crore
 - Present value of side effect of financing
1. Grant of Cash Subsidy ₹ 7.00 crore
 2. Subsidized Loan 50% (₹ 38 crore - ₹ 7 crore) = ₹ 15.50 crore

Present Value of Side Effect of Financing

	₹ Crore
Tax benefit on Interest (₹ 15.50 crore x 8% x 30%)	0.372
Saving on Interest (₹ 15.50 crore x 2%)	0.310
Tax benefit foregone on Interest (₹ 15.50 crore x 2% x 30%)	(0.093)
	0.589
PVAF @ 10% for 8 years	5.335
Present Value of Side Effect of Financing (0.589 x 5.335)	3.1423

APV = Base NPV + Present Value of Side Effect of Financing

$$= ₹ 14.20 \text{ crore} + ₹ 3.1423 \text{ crore} = ₹ 17.3423 \text{ crore}$$

Since APV of Project Y is more than combination XZ same should be accepted.

11. Working Notes:

$$\text{Value of C plc} = \frac{\text{Residual Cash Flow}}{k_e - g} = \frac{4,000,000}{0.1125 - 0} = ₹ 35,555,556$$

$$\text{Value of per share of C plc} = \frac{35,555,556}{5,000,000} = ₹ 7.11$$

$$\text{Book Value of per share of C plc} = \frac{29,750,000}{5,000,000} = ₹ 5.95$$

$$\text{Value of M plc} = \frac{\text{Residual Cash Flow}}{k_e - g} = \frac{6,000,000}{0.125 - 0} = ₹ 48,000,000$$

$$\text{Value of Combined Entity} = \frac{12,000,000}{0.12 - 0} = ₹ 100,000,000$$

$$\text{Value of Synergy} = \text{Value of Combined Entity} - \text{Individual Value of M plc and C plc}$$

Value of Synergy = £100,000,000 – (£48,000,000 + £35,555,556) = £16,444,444

- (i) Minimum price per share C plc should accept from M plc is £5.95 (current book value).
- (ii) Maximum price per share M plc shall be willing to offer to C plc shall be computed as follows:

$$= \frac{\text{Value of C plc as per Residual Cash Flow} + \text{Synergy Benefits}}{\text{No. of shares}}$$

$$= \frac{35,555,556 + 16,444,444}{5,000,000} = \frac{52,000,000}{5,000,000} = £10.40$$

- (iii) Floor Value of per share of C plc shall be £4 (current market price) and it shall not play any role in decision for the acquisition of C plc as it is lower than its current book value.

12. (a) Existing share price of Hanky Ltd.

$$g = r \times b$$

$$r = 15\%$$

$$b = 20\%$$

$$g = 0.15 \times 0.2$$

$$= 0.03$$

$$\text{Ex dividend market value} = \frac{\text{Next year's dividend}}{k_e - g}$$

$$= \frac{6,50,00,000 \times 0.8 \times 1.03}{0.21 - 0.03} = ₹ 29,75,55,556$$

$$\text{Value of one share} = \frac{₹ 29,75,55,556}{50,00,000} = ₹ 59.51 \text{ per share}$$

Existing share price Shanky Ltd.

$$g = r \times b$$

$$= 0.15 \times 0.8 = 0.12$$

$$\text{Ex dividend market value} = \frac{\text{Next year's dividend}}{k_e - g}$$

$$= \frac{2,40,00,000 \times 0.2 \times 1.12}{0.24 - 0.12} = ₹ 4,48,00,000$$

$$\text{Value of one share} = \frac{\text{₹}4,48,00,000}{1500000} = \text{₹} 29.87 \text{ per share}$$

(b) Value of Hanky Ltd. after the takeover

Care must be taken in calculating next year's dividend and the subsequent growth rate. Next year's earnings are already determined, because both companies have already reinvested their retained earnings at the current rate of return. In addition, they will get cost savings of ₹ 85,00,000.

The dividend actually paid out at the end of next year will be determined by the new 35% retention and the future growth rate will take into account the increased return on new investment.

Growth rate for combined firm, $g = 0.17 \times 0.35 = 0.06$

New cost of equity = 20%

Next year's earnings = ₹ 6,50,00,000 × 1.03 + ₹ 2,40,00,000 × 1.12 + ₹ 85,00,000
= ₹ 10,23,30,000

Next year's dividend = ₹ 10,23,30,000 × 0.65
= ₹ 6,65,14,500

Market value = $\frac{\text{₹} 6,65,14,500}{0.20 - 0.06} = \text{₹} 47,51,03,571$

(c) Maximum Hanky Ltd. should pay for Shanky Ltd.

Combined value = ₹ 47,51,03,571

Present Value of Hanky Ltd. = ₹ 29,75,55,556
= ₹ 17,75,48,015

13.

	₹
Debt capacity of merged company (2,00,00,000 × 0.30)	60,00,000
Less: Debt of A Ltd and T Ltd.	<u>30,00,000</u>
	30,00,000
Add: Marketable securities of both companies	<u>40,00,000</u>
	<u>70,00,000</u>

Since the combined liquidity of merged company shall remain comfortable, it shall be feasible to pay cash for acquiring the T Ltd. against tentative price of ₹ 65,00,000.

14. Calculation of NPV ('000)

Year	0	1	2	3
Inflation factor in India	1.00	1.10	1.21	1.331
Inflation factor in Africa	1.00	1.40	1.96	2.744
Exchange Rate (as per IRP)	6.00	7.6364	9.7190	12.3696
Cash Flows in ₹ '000				
Real	-50000	-1500	-2000	-2500
Nominal (1)	-50000	-1650	-2420	-3327.50
Cash Flows in African Rand '000				
Real	-200000	60000	80000	100000
Nominal	-200000	84000	156800	274400
In Indian ₹ '000 (2)	-33333	11000	16133	22183
Net Cash Flow in ₹ '000 (1)+(2)	-83333	9350	13713	18855.50
PVF@20%	1	0.833	0.694	0.579
PV	-83333	7789	9517	10917

NPV of 3 years = -55110 (₹ '000)

15. First of we shall calculate expected return from share of Company X

(i) Average annual capital gain (%)

Let g = average annual capital gain, then:

$$₹ 203.51(1+g)^{\frac{1}{4}} = ₹ 139$$

$$\text{Then } g = (203.51/139)^{\frac{1}{4}} - 1 = 0.10 \text{ i.e. } 10\%$$

(ii) Average annual dividend yield (%)

Year	Dividend/Share Price	Dividend Yield
2010	₹7.00/₹139	0.050
2011	₹8.50/ ₹147	0.058
2012	₹9.00/ ₹163	0.055
2013	₹9.50/ ₹179	0.053
2014 (Current Year)	₹10.00/ ₹203.51	0.049
		0.265

$$\text{Average Yield} = 0.265/5 = 0.053 \text{ i.e. } 5.3\%$$

Thus with this data expected return of share of Company X can be given as follows:

$$E(r_x) = \text{Average Annual Capital Gain} + \text{Average Annual Dividend}$$

$$= 10\% + 5.3\% = 15.3\%$$

Then we shall calculate expected return from market index as follows:

- (i) Average annual capital gain (%)

$$1300 (1+g)^{1/4} = 1768$$

$$\text{Then } g = (1768/1300)^{1/4} - 1 = 0.08 \text{ i.e. } 8\%$$

- (ii) Average annual dividend yield (%)

$$3\% + 5\% + 5.5\% + 4.75\% + 5.5\% = 23.75\%/5 = 4.75\%$$

$$\text{Thus expected return on Market Index } E(r_M) = 8\% + 4.75\% = 12.75\%$$

Average annual risk-free rate of return (Treasury Bond Return)

$$7\% + 9\% + 8\% + 8\% + 8\% = 40\%/5 = 8\%$$

Now with the above information we compute Beta (β) of share company X using CAPM as follows:

$$E(r_X) = r_f + \beta[E(r_M) - r_f]$$

$$15.3\% = 8\% + \beta[12.75\% - 8\%]$$

$$\beta = 1.54$$

16. (i)

Period	R_X	R_M	$R_X - \bar{R}_X$	$R_M - \bar{R}_M$	$(R_X - \bar{R}_X)(R_M - \bar{R}_M)$	$(R_M - \bar{R}_M)^2$
1	20	22	5	10	50	100
2	22	20	7	8	56	64
3	25	18	10	6	60	36
4	21	16	6	4	24	16
5	18	20	3	8	24	64
6	-5	8	-20	-4	80	16
7	17	-6	2	-18	-36	324
8	19	5	4	-7	-28	49
9	-7	6	-22	-6	132	36
10	<u>20</u>	<u>11</u>	5	-1	<u>-5</u>	<u>1</u>
	150	120			357	706
	ΣR_X	ΣR_M			$\Sigma (R_X - \bar{R}_X)(R_M - \bar{R}_M)$	$\Sigma (R_M - \bar{R}_M)^2$

$$\bar{R}_X = 15 \quad \bar{R}_M = 12$$

$$\sigma^2_M = \frac{\sum (R_M - \bar{R}_M)^2}{n} = \frac{706}{10} = 70.60$$

$$\text{Cov}_{XM} = \frac{\sum (R_X - \bar{R}_X)(R_M - \bar{R}_M)}{n} = \frac{357}{10} = 35.70$$

$$\text{Beta}_X = \frac{\text{Cov}_{XM}}{\sigma^2_M} = \frac{35.70}{70.60} = 0.505$$

$$(ii) \quad \bar{R}_X = 15 \quad \bar{R}_M = 12$$

$$y = \alpha + \beta x$$

$$15 = \alpha + 0.505 \times 12$$

$$\text{Alpha } (\alpha) = 15 - (0.505 \times 12)$$

$$= 8.94\%$$

$$\text{Characteristic line for security X} = \alpha + \beta \times R_M$$

Where, R_M = Expected return on Market Index

$$\therefore \text{Characteristic line for security X} = 8.94 + 0.505 R_M$$

17. First necessary adjustment of the data as reported by historical accounting system shall be made as follows:

	₹
Operating Profit	20,20,00,000
Add: Cost of unutilized Advertisement Expenditures	<u>2,00,00,000</u>
	<u>22,20,00,000</u>

Invested Capital (as per replacement cost) is ₹ 84 crore.

Accordingly,

$$\text{EVA} = \text{Operating Profit} - (\text{Invested Capital} \times \text{Cost of Capital})$$

$$= ₹ 22,20,00,000 - ₹ 84 \text{ crore} \times 11\%$$

$$= ₹ 22.2 \text{ crore} - ₹ 9.24 \text{ crore}$$

$$= ₹ 12.96 \text{ crore}$$

$$18. (1) \quad \beta_{\text{company}} = \beta_{\text{equity}} \times \frac{V_E}{V_0} + \beta_{\text{debt}} \times \frac{V_D}{V_0}$$

Note: Since β_{debt} is not given it is assumed that company debt capital is virtually riskless.

If company's debt capital is riskless than above relationship become:

$$\beta_{\text{company}} = \beta_{\text{equity}} \frac{V_E}{V_0} \quad \text{as } \beta_{\text{debt}} = 0$$

Here $\beta_{\text{equity}} = 1.5$;

$V_E = ₹ 60$ lakhs.

$V_D = ₹ 40$ lakhs.

$V_0 = ₹ 100$ lakhs.

$$\begin{aligned} \beta_{\text{company}} &= 1.5 \times \frac{₹ 60 \text{ lakhs}}{₹ 100 \text{ lakhs}} \\ &= 0.9 \end{aligned}$$

(2) Company's cost of equity = $R_f + \beta_A \times \text{Risk premium}$

Where R_f = Risk free rate of return

β_A = Beta of company assets

Therefore, company's cost of equity = $8\% + 0.9 \times 10 = 17\%$ and overall cost of capital shall be

$$= 17\% \times \frac{60,00,000}{100,00,000} + 8\% \times \frac{40,00,000}{100,00,000}$$

$$= 10.20\% + 3.20\% = 13.40\%$$

Alternatively it can also be computed as follows:

Cost of Equity = $8\% + 1.5 \times 10 = 23\%$

Cost of Debt = 8%

$$\text{WACC (Cost of Capital)} = 23\% \times \frac{60,00,000}{1,00,00,000} + 8\% \times \frac{40,00,000}{1,00,00,000} = 17\%$$

In case of expansion of the company's present business, the same rate of return i.e. 13.40% will be used. However, in case of diversification into new business the risk profile of new business is likely to be different. Therefore, different discount factor has to be worked out for such business.

19. Impact of Financial Restructuring

- (i) First we shall find out the probability the venture capital project survives to the end of six years.

Year	Probability Project survives
1	$(1 - 0.28) = 0.72$
2	$(1 - 0.28)(1 - 0.25) = 0.72 \times 0.75 = 0.54$
3	$(1 - 0.28)(1 - 0.25)(1 - 0.22) = 0.72 \times 0.75 \times 0.78 = 0.4212$
4	$(1 - 0.28)(1 - 0.25)(1 - 0.22)(1 - 0.18) = 0.72 \times 0.75 \times 0.78 \times 0.82 = 0.3454$
5	$(1 - 0.28)(1 - 0.25)(1 - 0.22)(1 - 0.18)(1 - 0.18) = 0.72 \times 0.75 \times 0.78 \times 0.82 \times 0.82 = 0.2832$
6	$(1 - 0.28)(1 - 0.25)(1 - 0.22)(1 - 0.18)(1 - 0.18)(1 - 0.10) = 0.72 \times 0.75 \times 0.78 \times 0.82 \times 0.82 \times 0.90 = 0.255$

Thus, probability of project will fail = $1 - 0.255 = 0.745$

- (ii) Next using CAPM we shall compute the cost of equity to compute the Present Value of Cash Flows

$$K_e = R_f + \beta (R_m - R_f)$$

$$= 6\% + 7(8\% - 6\%) = 20\%$$

- (iii) Now we shall compute the net present value of the project

The present value of cash inflow after 6 years

$$(\text{₹}600 \text{ Crore} \times \text{PVIF } 20\%) \quad \text{₹ } 201 \text{ Crore}$$

$$\text{Less:- Present value of Cash outflow} \quad \underline{\text{₹ } 45 \text{ Crore}}$$

$$\underline{\text{₹ } 156 \text{ Crore}}$$

$$\text{Net Present Value of project if it fails} \quad (\text{₹ } 45 \text{ Crores})$$

$$\text{Hence, expected NPV} = (0.255)(156) + (0.745)(-45) \quad \text{₹ } 6.255 \text{ Crores}$$

Since expected NPV of the project is positive it should be accepted.

20. (a) Unlike the CAPM which is a single factor model, the APT is a multi factor model having a whole set of Beta Values – one for each factor. Arbitrage Pricing Theory states that the expected return on an investment is dependent upon how that investment reacts to a set of individual macro-economic factors (degree of reaction measured by the Betas) and the risk premium associated with each of those macro – economic factors. The APT developed by Ross (1976) holds that there are four factors which explain the risk premium relationship of a particular security. Several factors being identified e.g. inflation and money supply, interest rate, industrial production and personal consumption have aspects of being inter-related.

$$\text{According to CAPM, } E(R_i) = R_f + \lambda \beta_i$$

Where, λ is the average risk premium $[E(R_m) - R_f]$

$$\text{In APT, } E(R_i) = R_f + \lambda_1 \beta_{i_1} + \lambda_2 \beta_{i_2} + \lambda_3 \beta_{i_3} + \lambda_4 \beta_{i_4}$$

Where, $\lambda_1, \lambda_2, \lambda_3, \lambda_4$ are average risk premium for each of the four factors in the model and $\beta_{i_1}, \beta_{i_2}, \beta_{i_3}, \beta_{i_4}$ are measures of sensitivity of the particular security i to each of the four factors.

- (b) Such mergers involve firms engaged in unrelated type of business operations. In other words, the business activities of acquirer and the target are neither related to each other horizontally (i.e., producing the same or competing products) nor vertically (having relationship of buyer and supplier). In a pure conglomerate merger, there are no important common factors between the companies in production, marketing, research and development and technology. There may however be some degree of overlapping in one or more of these common factors. Such mergers are in fact, unification of different kinds of businesses under one flagship company. The purpose of merger remains utilization of financial resources, enlarged debt capacity and also synergy of managerial functions.
- (c) Normally acquisitions are made friendly, however when the process of acquisition is unfriendly (i.e., hostile) such acquisition is referred to as 'takeover'. Hostile takeover arises when the Board of Directors of the acquiring company decide to approach the shareholders of the target company directly through a Public Announcement (Tender Offer) to buy their shares consequent to the rejection of the offer made to the Board of Directors of the target company.

Take Over Strategies: Other than Tender Offer the acquiring company can also use the following techniques:

- Street Sweep: This refers to the technique where the acquiring company accumulates larger number of shares in a target before making an open offer. The advantage is that the target company is left with no choice but to agree to the proposal of acquirer for takeover.
 - Bear Hug: When the acquirer threatens the target to make an open offer, the board of target company agrees to a settlement with the acquirer for change of control.
 - Strategic Alliance: This involves disarming the acquirer by offering a partnership rather than a buyout. The acquirer should assert control from within and takeover the target company.
 - Brand Power: This refers to entering into an alliance with powerful brands to displace the target's brands and as a result, buyout the weakened company.
- (d) Factors affecting Investment Decisions in Portfolio Management
- (i) Objectives of investment portfolio: There can be many objectives of making an investment. The manager of a provident fund portfolio has to look for security (low risk) and may be satisfied with none too higher return. An aggressive

investment company may, however, be willing to take a high risk in order to have high capital appreciation.

- (ii) Selection of investment
 - (a) What types of securities to buy or invest in? There is a wide variety of investments opportunities available i.e. debentures, convertible bonds, preference shares, equity shares, government securities and bonds, income units, capital units etc.
 - (b) What should be the proportion of investment in fixed interest/dividend securities and variable interest/dividend bearing securities?
 - (c) In case investments are to be made in the shares or debentures of companies, which particular industries show potential of growth?
 - (d) Once industries with high growth potential have been identified, the next step is to select the particular companies, in whose shares or securities investments are to be made.
- (iii) Timing of purchase: At what price the share is acquired for the portfolio depends entirely on the timing decision. It is obvious if a person wishes to make any gains, he should “buy cheap and sell dear” i.e. buy when the shares are selling at a low price and sell when they are at a high price.
- (e) The investment banker's work involved in a private placement is quite similar to sell-side M&A representation. The bankers attempt to find a buyer by writing the private Placement Memorandum (PPM) and then contacting potential strategic or financial buyers of the client.

Because private placements involve selling equity and debt to a single buyer, the investor and the seller (the company) typically negotiate the terms of the deal. Investment bankers function as negotiators for the company, helping to convince the investor of the value of the firm. Fees involved in private placements work like those in public offerings. Usually they are a fixed percentage of the size of the transaction.