

PAPER – 2: STRATEGIC FINANCIAL MANAGEMENT

QUESTIONS

Risk Analysis in Capital Budgeting

1. L & R Limited wishes to develop new virus-cleaner software. The cost of the pilot project would be ₹ 2,40,000. Presently, the chances of the product being successfully launched on a commercial scale are rated at 50%. In case it does succeed L&R can further invest a sum of ₹ 20 lacs to market the product. Such an effort can generate perpetually, an annual net after tax cash income of ₹ 4 lacs. Even if the commercial launch fails, they can make an investment of a smaller amount of ₹ 12 lacs with the hope of gaining perpetually a sum of ₹ 1 lac. Evaluate the proposal, adopting decision tree approach. The applicable discount rate is 10%.
2. XYZ Ltd. requires ₹ 8,00,000 for a new project. Useful life of project - 4 years. Salvage value - Nil. Depreciation Charge ₹ 2,00,000 p.a. Expected revenues & costs (excluding depreciation) ignoring inflation.

Year	1	2	3	4
Revenues	₹ 6,00,000	₹ 7,00,000	₹ 8,00,000	₹ 8,00,000
Costs	₹ 3,00,000	₹ 4,00,000	₹ 4,00,000	₹ 4,00,000

If applicable Tax Rate is 60% and cost of capital is 10% then calculate NPV of the project, if inflation rates for revenues & costs are as follows:

Year	Revenues	Costs
1	10%	12%
2	9%	10%
3	8%	9%
4	7%	8%

3. IPL already in production of Fertilizer is considering a proposal of building a new plant to produce pesticides. Suppose, the PV of proposal is ₹ 100 crore without the abandonment option. However, if market conditions for pesticide turns out to be favourable the PV of proposal shall increase by 30%. On the other hand market conditions remain sluggish the PV of the proposal shall be reduced by 40%. In case company is not interested in continuation of the project it can be disposed off for ₹ 80 crore.

If the risk free rate of interest is 8% than what will be value of abandonment option

Leasing

4. With the following data available compute the Break Even Lease Rental (BELR) that ABC Ltd. should charge from lessee.

Cost of Machine	₹ 150 Lakh
Expected Useful Life	5 year

Salvage Value of Machine at the end of 5 years	₹ 10 lakh
Rate of Depreciation (WDV)	25%
K_0	14%
Applicable Tax Rate	35%

Machine will constitute a separate block for depreciation purpose.

Dividend Decisions

5. The following information pertains to M/s XY Ltd.

Earnings of the Company	₹ 5,00,000
Dividend Payout ratio	60%
No. of shares outstanding	1,00,000
Equity capitalization rate	12%
Rate of return on investment	15%

- What would be the market value per share as per Walter's model?
- What is the optimum dividend payout ratio according to Walter's model and the market value of Company's share at that payout ratio?

Indian Capital Market

6. BSE	5000
Value of portfolio	₹ 10,10,000
Risk free interest rate	9% p.a.
Dividend yield on Index	6% p.a.
Beta of portfolio	1.5

We assume that a future contract on the BSE index with four months maturity is used to hedge the value of portfolio over next three months. One future contract is for delivery of 50 times the index.

Based on the above information calculate:

- Price of future contract.
- The gain on short futures position if index turns out to be 4,500 in three months.

Security Analysis

7. Following Financial data are available for PQR Ltd. for the year 2008:

	(₹ in lakh)
8% debentures	125
10% bonds (2007)	50
Equity shares (₹ 10 each)	100

Reserves and Surplus	300
Total Assets	600
Assets Turnovers ratio	1.1
Effective interest rate	8%
Effective tax rate	40%
Operating margin	10%
Dividend payout ratio	16.67%
Current market Price of Share	₹ 14
Required rate of return of investors	15%

You are required to:

- (i) Draw income statement for the year
 - (ii) Calculate its sustainable growth rate
 - (iii) Calculate the fair price of the Company's share using dividend discount model, and
 - (iv) What is your opinion on investment in the company's share at current price?
8. The following data are available for a bond

Face value	₹ 1,000
Coupon Rate	16%
Years to Maturity	6
Redemption value	₹ 1,000
Yield to maturity	17%

Calculate the duration and volatility of this bond?

Portfolio Theory

9. Suppose if Treasury Bills give a return of 5% and Market Return is 13%, then determine
- (i) The market risk premium
 - (ii) β Values and required returns for the following combination of investments.

Treasury Bill	100	70	30	0
Market	0	30	70	100

10. The following information is available of Jay Kay Ltd. and of Market (Index)

Year	Jay Kay Limited		Market		Return on Govt. Bonds
	Average Share Price (₹)	DPS (₹)	Average Index	Dividend Yield (%)	
2002	242	20	1812	4	6
2003	279	25	1950	5	5
2004	305	30	2258	6	4
2005	322	35	2220	7	5

Compute Beta Value of the company at the end of the year 2005.

11. The following details are given for X and Y companies' stocks and the Bombay Sensex for a period of one year. Calculate the systematic and unsystematic risk for the companies' stocks. What would be the portfolio risk if equal amount of money is allocated among these stocks?

	X Stock	Y Stock	Sensex
Average return	0.15	0.25	0.06
Variance of return	6.30	5.86	2.25
β	0.71	0.685	
Correlation Co-efficient	0.424		
Co-efficient of determination (r^2)	0.18		

Financial Services

12. Mr. Stanley Joseph has secured from a housing bank, a six year housing loan of ₹ 12,00,000. The loan was structured as follows:

Loan Amount	---	₹ 12,00,000
Repayment	---	Six equated annual installments, payable in arrears.
Reference Base	---	Prime Lending Rate
Reference Rate	---	9% on the date of loan
Interest on Loan	---	1 percentage point over reference rate of 9%
Annual Installment	---	₹ 2,75,530

Two years after the loan was granted, the prime rate moves down to 8% and the effective rate on the loan automatically stood revised to 9%. Determine the revised amount of instalment.

13. You have a housing loan with one of India's top housing finance companies. The amount outstanding is ₹ 1,89,540. You have now paid an installment. Your next installment falls due a year later. There are five more installments to go, each being ₹ 50,000. Another housing finance company has offered to take over this loan on a seven year repayment basis. You will be required to pay ₹ 36,408 p.a. with the first installment falling a year later. The processing fee is 3% of amount taken over. For swapping you will have to pay ₹ 12,000 to the first company. Should you swap the loan?

[Given (PVAF 10%, 5) = 3.791 and (PVAF 8%, 7) = 5.206]

14. A company is considering engaging a factor, the following information is available:
- (i) The current average collection period for the Company's debtors is 80 days and ½% of debtors default. The factor has agreed to pay money due after 60 days and will take the responsibility of any loss on account of bad debts.
 - (ii) The annual charge for the factoring is 2% of turnover payable annually in arrears. Administration cost saving is likely to be ₹ 1,00,000 per annum.
 - (iii) Annual sales, all on credit, are ₹ 1,00,00,000. Variable cost is 80% of sales price. The Company's cost of borrowing is 15% per annum. Assume the year is consisting of 365 days.

Should the Company enter into a factoring agreement?

Mutual Funds

15. Orange purchased 200 units of Oxygen Mutual Fund at ₹ 45 per unit on 31st December, 2009. In 2010, he received ₹ 1.00 as dividend per unit and a capital gains distribution of ₹ 2 per unit.

Required:

- (i) Calculate the return for the period of one year assuming that the NAV as on 31st December 2010 was ₹ 48 per unit.
- (ii) Calculate the return for the period of one year assuming that the NAV as on 31st December 2010 was ₹ 48 per unit and all dividends and capital gains distributions have been reinvested at an average price of ₹ 46.00 per unit.

Ignore taxation.

Money Market Instruments

16. Bank A enters into a Repo for 14 days with Bank B in 12% GOI Bonds 2017 at a rate of 5.25% for ₹ 5 Crore. Assuming that the clean price be 99.42, initial margin be 2% and days of accrued interest be 292, you are required to determine:

- (a) Dirty Price
- (b) Start Proceeds (First Leg)
- (c) Repayment at Maturity (Second Leg)

Note: Assume number of days in a year as 360.

International Financial Management

17. Opus Technologies Ltd., an Indian IT company is planning to make an investment through a wholly owned subsidiary in a software project in China with a shelf life of two years. The inflation in China is estimated as 8 percent. Operating cash flows are received at the year end.

For the project an initial investment of Chinese Yuan (CN¥) 30,00,000 will be in a piece of land. The land will be sold after the completion of project at estimated value of CN¥ 35,00,000. The project also requires an office complex at cost of CN¥ 15,00,000 payable at the beginning of project. The complex will be depreciated on straight-line basis over two years to a zero salvage value. This complex is expected to fetch CN¥ 5,00,000 at the end of project.

The company is planning to raise the required funds through GDR issue in Mauritius. Each GDR will have 5 common equity shares of the company as underlying security which are currently trading at ₹ 200 per share (Face Value = ₹ 10) in the domestic market. The company has currently paid a dividend of 25% which is expected to grow at 10% p.a. The total issue cost is estimated to be 1 percent of issue size.

The annual sales is expected to be 10,000 units at the rate of CN¥ 500 per unit. The price of unit is expected to rise at the rate of inflation. Variable operating costs are 40 percent of sales. Current Fixed Operating costs is CN¥ 22,00,000 per year which is expected to rise at the rate of inflation.

The tax rate applicable in China for business income and capital gain is 25 percent and as per GOI Policy no further tax shall be payable in India. The current spot rate of CN¥ 1 is ₹ 9.50. The nominal interest rate in India and China is 12% and 10% respectively and the international parity conditions hold.

You are required to

- Identify expected future cash flows in China and determine NPV of the project in CN¥.
- Determine whether Opus Technologies should go for the project or not, assuming that there neither there is any restriction nor any charges/taxes payable on the transfer of funds from China to India.

Foreign Exchange Risk Management

18. Following are the rates quoted at Mumbai for British Pound (£):

Spot (£/₹)	52.60/70	Interest Rates	India	London
3 m Forward	20/70	3 months	8%	5%
6 m Forward	50/75	6 months	10%	8%

Verify whether there is any scope for covered interest arbitrage, if you can borrow in rupees.

Mergers & Acquisitions

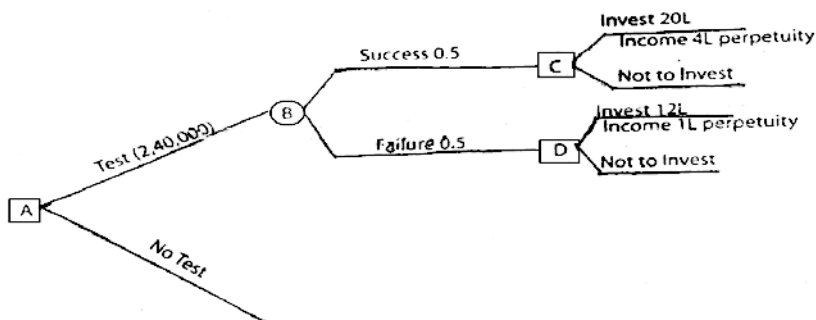
19. Simpson Ltd. is considering a merger with Wilson Ltd. The data below are in the hands of both Board of Directors. The issue at hand is how many shares of Simpson should be exchanged for Wilson Ltd. Both boards are considering three possibilities 20,000, 25,000 and 30,000 shares. You are required to construct a table demonstrating the potential impact of each scheme on each set of shareholders:

		Simpson Ltd.	Wilson Ltd.	Combined Post merger Firm 'A'
1.	Current earnings per year	2,00,000	1,00,000	3,50,000
2.	Shares outstanding	50,000	10,000	?
3.	Earnings per share (₹) (1 ÷ 2)	4	10	?
4.	Price per share (₹)	40	100	?
5.	Price-earning ratio [4 ÷ 3]	10	10	10
6.	Value of firm (₹)	20,00,000	10,00,000	35,00,000
7.	Expected Annual growth rate in earnings in foreseeable future	0	0	0

20. Write a short note on
- Factors that affect Bond's Duration
 - Process of Portfolio Management
 - Benefits of International Portfolio Investment
 - Benefits of Debit Card
 - Factors affecting the selection of Mutual Funds

SUGGESTED ANSWERS/HINTS

1. Decision tree diagram is given below:



Evaluation

At Decision Point C: The choice is between investing ₹ 20 lacs for a perpetual benefit of ₹ 4 lacs and not to invest. We shall determine the PV of Benefits in perpetuity (Capitalised Value) as follows:

$$= \frac{\text{₹ 4 lac}}{0.10} = \text{₹ 40 lac}$$

Net Benefit = ₹ 40 lac - ₹ 20 lac = ₹ 20 lac

The preferred choice is to invest, since the capitalized value yields a net benefit of ₹ 20 lacs.

At Decision Point D: The choice is between investing ₹ 12 lacs, for a similar perpetual benefit of ₹ 1 lac, and not to invest shall be based on net benefit as computed above.

$$= \frac{\text{₹ 1 lac}}{0.10} = \text{₹ 10 lac}$$

Net Benefit = ₹ 10 lac - ₹ 12 lac = - ₹ 2 lac

Since, there is a negative benefit of ₹ 2 lacs. Therefore, it would not be prudent to invest at this point.

At Outcome Point B: Evaluation of EMV is as under (₹ in lacs).

<i>Outcome</i>	<i>Amount (₹)</i>	<i>Probability</i>	<i>Result (₹)</i>
<i>Success</i>	20.00	0.50	10.00
<i>Failure</i>	0.00	0.50	00.00
<i>Net result</i>			10.00

EMV at B is, therefore, ₹ 10 lacs.

At Decision Point A: Decision is to be taken based on preferences between two alternatives. The first is to test, by investing ₹ 2,40,000 and reap a benefit of ₹ 10 lacs. The second is not to test, and thereby losing the opportunity of a possible gain.

The preferred choice is, therefore, investing a sum of ₹ 2,40,000 and undertaking the test.

2. Computation of Annual Cash Flow

(i) Inflation adjusted Revenues

<i>Year</i>	<i>Revenues (₹)</i>	<i>Revenues (Inflation Adjusted) (₹)</i>
1	6,00,000	6,00,000(1.10) = 6,60,000
2	7,00,000	7,00,000(1.10)(1.09) = 8,39,300
3	8,00,000	8,00,000(1.10)(1.09)(1.08) = 10,35,936
4	8,00,000	8,00,000(1.10)(1.09)(1.08)(1.07) = 11,08,452

(ii) Inflation adjusted Costs

Year	Revenues (₹)	Revenues (Inflation Adjusted) (₹)
1	3,00,000	3,00,000(1.12) = 3,36,000
2	4,00,000	4,00,000(1.12)(1.10) = 4,92,800
3	4,00,000	4,00,000(1.12)(1.10)(1.09) = 5,37,172
4	4,00,000	4,00,000(1.12)(1.10)(1.09)(1.08) = 5,80,124

(iii) Tax Benefit on Depreciation = ₹ 2,00,000 x 0.60 = ₹ 1,20,000

(iv) Net Profit after Tax

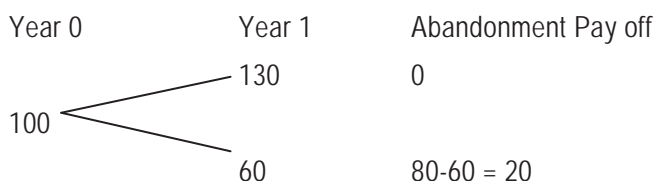
Year	Revenues (Inflation Adjusted) (₹)(1)	Costs (Inflation Adjusted) (₹)(2)	Net Profit (₹) (3) = (1) - (2)	Tax (₹) (4) = 60% of (3)	Net after Profit (₹) (3) - (4)
1	6,60,000	3,36,000	3,24,000	1,94,400	1,29,600
2	8,39,300	4,92,800	3,46,500	2,07,900	1,38,600
3	10,35,936	5,37,172	4,98,764	2,99,258	1,99,506
4	11,08,452	5,80,124	5,28,328	3,16,997	2,11,331

(iv) Present Value of Cash Inflows

Year	Net after Profit (₹)	Tax Benefit on Depreciation (₹)	Cash Inflow (₹)	PVF@ 10%	PV (₹)
1	1,29,600	1,20,000	2,49,600	0.909	2,26,886
2	1,38,600	1,20,000	2,58,600	0.826	2,13,604
3	1,99,506	1,20,000	3,19,506	0.751	2,39,949
4	2,11,331	1,20,000	3,31,331	0.683	2,26,299
					9,06,738

$$NPV = ₹ 9,06,738 - ₹ 8,00,000 = ₹ 1,06,738$$

3. Decision Tree showing pay off



First of all we shall calculate probability of high demand (P) using risk neutral method as follows:

$$8\% = p \times 30\% + (1-p) \times (-40\%)$$

$$0.08 = 0.30 p - 0.40 + 0.40p$$

$$p = \frac{0.48}{0.70} = 0.686$$

The value of abandonment option will be computed as follows:

Expected Payoff at Year 1

$$\begin{aligned} &= p \times 0 + [(1-p) \times 20] \\ &= 0.686 \times 0 + [0.314 \times 20] \\ &= ₹ 6.28 \text{ crore} \end{aligned}$$

Since expected pay off at year 1 is 6.28 crore. Present value of expected pay off will be:

$$\frac{6.28}{1.08} = 5.81 \text{ crore.}$$

Thus the value of abandonment option (Put Option) is ₹ 5.80 crore.

4. Cost of Machine	₹ 150,00,000
Less: - PV of Salvage Value (W1)	₹ 5,19,400
Less: PV of Tax benefit on Depreciation (W2)	₹ 27,34,184
Less: PV of Tax Saving on STCL at the end of 5 year (W3)	<u>₹ 6,80,478</u>
	<u>₹ 110,65,938</u>

PVIFA for 5 years @14% 3.433

$$\text{After tax Break Even Lease Rental} = \frac{1,10,65,938}{3.433} = 32,23,400$$

$$\text{Before Tax BELR} = \frac{32,23,400}{(1-0.35)} = ₹ 49,59,100$$

Working Notes

W1

Salvage Value = ₹ 10,00,000

PVF @14% = 0.5194

PV of Salvage Value = ₹ 5,19,400

W2

Table showing calculation of PV of Tax Benefit on Depreciation

Year	Opening WDV (₹)	Depreciation @ 25% (₹)	Closing WDV (₹)	FVF @14%	PV (₹)
1	150,00,000	37,50,000	11,250,000	0.877	32,88,750
2	112,50,000	28,12,500	84,37,500	0.769	21,62,813
3	84,37,500	21,09,375	63,28,125	0.675	14,23,828
4	63,28,125	15,82,031	47,46,094	0.592	9,36,562
					<u>78,11,953</u>

Tax Benefit on Depreciation = ₹ 78,11,953 X 0.35 = ₹ 27,34,184

W3

PV of Tax benefit on Short Term Capital Loss (STCL)

WDV at beginning of 5 year as per above table	47,46,094
Less: Salvage Value	<u>10,00,000</u>
STCL	<u>37,46,094</u>
Tax Benefit	13,11,133
PVF at 14%	0.519
PV of Tax Benefit on STCL	6,80,478

5. M/s XY Ltd.

(i) Walter's model is given by

$$P = \frac{D + (E - D)(r / k_e)}{K_e}$$

Where,

- P = Market price per share.
E = Earnings per share = ₹ 5 (₹ 5,00,000/ 1,00,000)
D = Dividend per share = ₹ 3 (0.60 x ₹ 5)
r = Return earned on investment = 15%
K_e = Cost of equity capital = 12%

$$P = \frac{3 + (5-3) \times \frac{0.15}{0.12}}{0.12} = \frac{3 + 2 \times \frac{0.15}{0.12}}{0.12} = ₹ 45.83$$

- (ii) According to Walter's model when the return on investment is more than the cost of equity capital, the price per share increases as the dividend pay-out ratio decreases. Hence, the optimum dividend pay-out ratio in this case is nil.

So, at a pay-out ratio of zero, the market value of the company's share will be:

$$\frac{0 + (5-0) \frac{0.15}{0.12}}{0.12} = ₹ 52.08$$

6. (i) Current future price of the index = $5000 + 5000 (0.09-0.06) \frac{4}{12} = 5000 + 50 = 5,050$

∴ Price of the future contract = ₹ 50 x 5,050 = ₹ 2,52,500

- (ii) Hedge ratio = $\frac{1010000}{252500} \times 1.5 = 6$ contracts

Index after three months turns out to be 4500

$$\text{Future price will be} = 4500 + 4500 (0.09-0.06) \times \frac{1}{12} = 4,511.25$$

Therefore, Gain from the short futures position is = $6 \times (5050 - 4511.25) \times 50$
= ₹ 1,61,625

Note: Alternatively we can also use daily compounding (exponential) formula.

7. Workings:

Asset turnover ratio = 1.1

Total Assets = ₹ 600

Turnover ₹ 600 lakhs × 11 = ₹ 660 lakhs

Effective interest rate = $\frac{\text{Interest}}{\text{Liabilities}} = 8\%$

Liabilities = ₹ 125 lakhs + 50 lakhs = 175 lakh

Interest = ₹ 175 lakhs × 0.08 = ₹ 14 lakh

Operating Margin = 10%

Hence operating cost = $(1 - 0.10) ₹ 660 \text{ lakhs} = ₹ 594 \text{ lakh}$

Dividend Payout = 16.67%

Tax rate = 40%

(i) Income statement

	(₹ Lakhs)
Sale	660
Operating Exp	<u>594</u>
EBIT	66
Interest	<u>14</u>
EBT	52
Tax @ 40%	<u>20.80</u>
EAT	31.20
Dividend @ 16.67%	<u>5.20</u>
Retained Earnings	<u>26.00</u>

(ii) $SGR = G = ROE (1-b)$

$$ROE = \frac{PAT}{NW} \text{ and } NW = ₹ 100 \text{ lakh} + ₹ 300 \text{ lakh} = 400 \text{ lakh}$$

$$ROE = \frac{₹ 31.2 \text{ lakhs}}{₹ 400 \text{ lakhs}} \times 100 = 7.8\%$$

$$SGR = 0.078(1 - 0.1667) = 6.5\%$$

(iii) Calculation of fair price of share using dividend discount model

$$P_0 = \frac{D_0(1+g)}{k_e - g}$$

$$\text{Dividends} = \frac{₹ 5.2 \text{ lakhs}}{₹ 10 \text{ lakhs}} = ₹ 0.52$$

$$\text{Growth Rate} = 6.5\%$$

$$\text{Hence } P_0 = \frac{₹ 0.52(1+0.065)}{0.15-0.065} = \frac{₹ 0.5538}{0.085} = ₹ 6.51$$

(iv) Since the current market price of share is ₹ 14, the share is overvalued. Hence the investor should not invest in the company.

8. To calculate the duration first we shall calculate Market price of bond as follows:

$$\begin{aligned} & 160 (PVIFA 17\%,6) + 1,000 (PVIF 17\%,6) \\ & = 160 (3.589) + 1,000 (0.390) \\ & = 574.24 + 390 \\ & = 964.24 \end{aligned}$$

1. Duration

Year	Cash flow	P.V. @ 17%		Proportion of bond value	Proportion of bond value x time (years)
1	160	0.855	136.80	0.142	0.142
2	160	0.731	116.96	0.121	0.242
3	160	0.624	99.84	0.103	0.309
4	160	0.534	85.44	0.089	0.356
5	160	0.456	72.96	0.076	0.38
6	1160	0.390	<u>452.40</u>	<u>0.469</u>	<u>2.814</u>
			<u>964.40</u>	<u>1.000</u>	<u>4.243</u>

Duration of the Bond is 4.243 years

2. Volatility

$$\text{Volatility of the bonds} = \frac{\text{Duration}}{(1 + \text{YTM})} = \frac{4.243}{1.17} = 3.63\%$$

9. (i) Market Risk Premium $R_m - R_f = 13\% - 5\% = 8\%$
(ii) β is the weighted average of investing in portfolios consisting of market ($\beta = 1$) and beta of treasury bills ($\beta = 0$)

Portfolio	Treasury Bills: Market Portfolio	β	$R_j = R_f + \beta \times (R_m - R_f)$
1	100:0	0	$5\% + 0(13\%-5\%)=5\%$
2	70:30	$0.7(0)+0.3(1)=0.3$	$5\%+0.3(13\%-5\%)=7.40\%$
3	30:70	$0.3(0)+0.7(1)=0.7$	$5\%+0.7(13\%-5\%)=10.60\%$
4	0:100	1	$5\%+1.0(13\%-5\%)=13\%$

10. Computation of Beta Value

Calculation of Returns

$$\text{Returns} = \frac{D_1 + (P_1 - P_0)}{P_0} \times 100$$

Year

Returns

$$2002 - 2003 \quad \frac{25 + (279 - 242)}{242} \times 100 = 25.62\%$$

$$2003 - 2004 \quad \frac{30 + (305 - 279)}{279} \times 100 = 20.07\%$$

$$2004 - 2005 \quad \frac{35 + (322 - 305)}{305} \times 100 = 17.05\%$$

Calculation of Returns from market Index

Year	% of Index Appreciation Yield %	Dividend Return %	Total
2002 – 2003	$\frac{1950 - 1812}{1812} \times 100 = 7.62\%$	5%	12.62%
2003 – 2004	$\frac{2258 - 1950}{1950} \times 100 = 15.79\%$	6%	21.79%
2004 – 2005	$\frac{2220 - 2258}{2258} \times 100 = (-)1.68\%$	7%	5.32%

Computation of Beta

Year	X	Y	XY	Y ²
2002-2003	25.62	12.62	323.32	159.26
2003-2004	20.07	21.79	437.33	474.80
2004-2005	17.05	5.32	90.71	28.30
	62.74	39.73	851.36	662.36

$$\bar{X} = \frac{62.74}{3} = 20.91, \quad \bar{Y} = \frac{39.73}{3} = 13.24$$

$$\begin{aligned} \beta &= \frac{\sum XY - n\bar{X}\bar{Y}}{\sum Y^2 - n\bar{Y}^2} \\ &= \frac{851.36 - 3(20.91)(13.24)}{662.36 - 3(13.24)^2} \\ &= \frac{851.36 - 830.55}{662.36 - 525.89} = \frac{20.81}{136.47} = 0.15 \end{aligned}$$

11. The co-efficient of determination (r^2) gives the percentage of the variation in the security's return that is explained by the variation of the market index return. In the X company stock return, 18 per cent of variation is explained by the variation of the index and 82 per cent is not explained by the index.

According to Sharpe, the variance explained by the index is the systematic risk. The unexplained variance or the residual variance is the unsystematic risk.

Company X:

$$\text{Systematic risk} = \beta_i^2 \times \text{Variance of market index}$$

$$= (0.71)^2 \times 2.25 = 1.134$$

$$\begin{aligned} \text{Unsystematic risk}(\epsilon_i^2) &= \text{Total variance of security return} - \text{Systematic risk} \\ &= 6.3 - 1.134 \\ &= 5.166 \end{aligned}$$

or

$$\begin{aligned} &= \text{Variance of Security Return} (1 - r^2) \\ &= 6.3 \times (1 - 0.18) = 6.3 \times 0.82 = 5.166 \end{aligned}$$

$$\begin{aligned} \text{Total risk} &= \beta_i^2 \times \sigma_m^2 + \epsilon_i^2 \\ &= 1.134 + 5.166 = 6.3 \end{aligned}$$

Company Y:

$$\begin{aligned} \text{Systematic risk} &= \beta_i^2 \times \sigma_m^2 \\ &= (0.685)^2 \times 2.25 = 1.056 \end{aligned}$$

$$\begin{aligned} \text{Unsystematic risk} &= \text{Total variance of the security return} - \text{systematic risk.} \\ &= 5.86 - 1.056 = 4.804 \end{aligned}$$

$$\begin{aligned} \sigma_p^2 &= \left[\left(\sum_{i=1}^N X_i \beta_i \right)^2 \sigma_m^2 \right] + \left[\left(\sum_{i=1}^N X_i^2 \epsilon_i^2 \right) \right] \\ &= [(0.5 \times 0.71 + 0.5 \times 0.685)^2 \times 2.25] + [(0.5)^2(5.166) + (0.5)^2(4.804)] \\ &= [(0.355 + 0.3425)^2 \times 2.25] + [(1.292 + 1.201)] = 1.0946 + 2.493 = 3.5876 \end{aligned}$$

12. Revision in equated Instalments

1. Determination of Unpaid principal
2. Re-Computation of EMI for revised period at revised rate

Determination of Remaining Principal

Year	Opg. Bal (₹)	Interest @10% (₹)	Total (₹)	Repaid (₹)	Clg. Bal (₹)
1	12,00,000	1,20,000	13,20,000	2,75,530	10,44,470
2	10,44,470	1,04,447	11,48,917	2,75,530	8,73,387

Determination of Revised Equated Monthly Installments

New Amount	₹ 8,73,387
New Period	4 years

New Rate (8% + 1%)	9%	
PVAF	3.240	
Installment	₹ 8,73,387 / 3.240	= ₹ 2,69,564

Bank shall revise installment from ₹ 2,75,530 to ₹ 2,69,564.

13. Present Interest Rate

For a loan of ₹ 1,89,540 annuity being ₹ 50,000, PVAF = 3.791 (₹ 1,89,540 / ₹ 50,000). From PVAF table for 5 years, this corresponds to 10%.

New Interest Rate

For a similar loan, annuity being ₹ 36,408, PVAF = 5.206 (₹ 1,89,540 / ₹ 36,408). From PVAF table for 7 years, this corresponds to 8%.

Interest Rate is prima facie beneficial.

Additional Charges

(i) Swap Charges	₹ 12,000
(ii) Processing fee 3% on loan amount (3/100 × ₹ 1,89,540)	₹ 5,686

Let us compute the IRR as follows:

$$₹ 1,89,540 - ₹ 12,000 - ₹ 5,686 = \frac{36,408}{(1+IRR)^1} \dots \dots \dots \frac{36,408}{(1+IRR)^7}$$

$$IRR = 10.947\%$$

Since interest rate on existing loan is 10% while proposed loan is 10.947% hence proposed loan is more expensive and it is advisable not to swap.

14. The annual change in cash flows through entering into a factoring agreement is:

Savings	(Amount in ₹)	(Amount in ₹)
Administration cost saved		1,00,000
Existing average debtors [₹ 1,00,00,000/365) x 80 days]	21,91,781	
Average New Debtors [(₹ 1,00,00,000/365) x 60 days]	<u>16,43,836</u>	
Reduction in debtors	<u>5,47,945</u>	
Cost there of @80%	<u>4,38,356</u>	
Add: Interest saving @15% p.a. on ₹ 4,38,356		65,753

Add: Bad Debts saved @.005 of ₹ 1,00,00,000		<u>50,000</u>
	Total	2,15,753
Less: Annual charges @2% of ₹ 1,00,00,000		<u>2,00,000</u>
Net annual benefits of factoring		<u>15,753</u>

Therefore, the factoring agreement is worthwhile and should be undertaken.

15. (i) Returns for the year

(All changes on a Per -Unit Basis)

Change in Price:	₹ 48 – ₹ 45 =	₹ 3.00
Dividends received:		₹ 1.00
Capital gains distribution		<u>₹ 2.00</u>
Total reward		<u>₹ 6.00</u>

Holding period reward: $\frac{₹ 6.00}{₹ 45} \times 100 = 13.33\%$

(ii) When all dividends and capital gains distributions are re-invested into additional units of the fund @ (₹ 46/unit)

Dividend + Capital Gains per unit	= ₹ 1.00 + ₹ 2.00 = ₹ 3.00
Total received from 200 units	= ₹ 3.00 x 200 = ₹ 600/-.
Additional Units Acquired	= ₹ 600/₹ 46 = 13.04 Units.
Total No. of Units	= 200 units + 13.04 units = 213.04 units.
Value of 213.04 units held at the end of the year	= 213.04 units x ₹ 48 = ₹ 10225.92

Price Paid for 200 Units at the beginning of the year = 200 units x ₹ 45 = ₹ 9000.00

Holding Period Reward ₹ (10225.92 – 9000.00) = ₹ 1225.92

Holding Period Reward = $\frac{₹ 1225.92}{₹ 9000} \times 100 = 13.62\%$

16. (a) Dirty Price

= Clean Price + Interest Accrued

$$= 99.42 + 100 \times \frac{12}{100} \times \frac{292}{360}$$

= 109.1533

(b) First Leg (Start Proceed)

$$= \text{Nominal Value} \times \frac{\text{Dirty Price}}{100} \times \frac{100 - \text{Initial Margin}}{100}$$

$$= ₹ 5,00,00,000 \times \frac{109.1533}{100} \times \frac{100 - 2}{100}$$

$$= ₹ 5,34,85,117 \text{ say } ₹ 5,34,85,000$$

(c) Second Leg (Repayment at Maturity)

$$= \text{Start Proceed} \times \left(1 + \text{Repo rate} \times \frac{\text{No. of days}}{360}\right)$$

$$= ₹ 5,34,85,000 \times \left(1 + 0.0525 \times \frac{14}{360}\right) = ₹ 5,35,94,199$$

17. Working Notes:

1. Calculation of Cost of Capital (GDR)

Current Dividend (D_0)	2.50
Expected Dividend (D_1)	2.75
Net Proceeds (200 – 1% of 200)	198.00
Growth Rate	10.00%

$$k_e = \frac{2.75}{198} + 0.10 = 0.1139 \text{ i.e. } 11.39\%$$

2. Calculation of Expected Exchange Rate as per Interest Rate Parity

YEAR	EXPECTED RATE
1	$= 9.50 \times \frac{(1 + 0.12)}{(1 + 0.10)} = 9.67$
2	$= 9.50 \times \frac{(1 + 0.12)^2}{(1 + 0.10)^2} = 9.85$

3. Realization on the disposal of Land net of Tax

	CN¥
Sale value at the end of project	3500000.00
Cost of Land	3000000.00
Capital Gain	500000.00
Tax paid	125000.00
Amount realized net of tax	3375000.00

4. Realization on the disposal of Office Complex

	(CN¥)
Sale value at the end of project	500000.00
WDV	0.00
Capital Gain	500000.00
Tax paid	125000.00
Amount realized net of tax (A)	375000.00

5. Computation of Annual Cash Inflows

Year	1	2
Annual Units	10000	10000
Price per bottle (CN¥)	540.00	583.20
Annual Revenue (CN¥)	5400000.00	5832000.00
Less: Expenses		
Variable operating cost (CN¥)	2160000.00	2332800.00
Depreciation (CN¥)	750000.00	750000.00
Fixed Cost per annum (CN¥)	2376000.00	2566080.00
PBT (CN¥)	114000.00	183120.00
Tax on Profit (CN¥)	28500.00	45780.00
Net Profit (CN¥)	85500.00	137340.00
Add: Depreciation (CN¥)	750000.00	750000.00
Cash Flow	835500.00	887340.00

(a) Computation of NPV of the project in CN¥ (CN¥)

Year	0	1	2
Initial Investment	-4500000.00		
Annual Cash Inflows		835500.00	887340.00
Realization on the disposal of Land net of Tax			3375000.00
Realization on the disposal of Office Complex			375000.00
Total	-4500000.00	835500.00	4637340.00
PVF @11.39%	1.000	0.898	0.806
PV of Cash Flows	-4500000.00	750279.00	3737696.00
NPV			-12,025

(b) Evaluation of Project from Opus Point of View

- (i) Assuming that inflow funds are transferred in the year in which same are generated i.e. first year and second year.

Year	0	1	2
Cash Flows (CN¥)	-4500000.00	835500.00	4637340.00
Exchange Rate (₹ / CN¥)	9.50	9.67	9.85
Cash Flows (₹)	-42750000.00	8079285.00	45677799.00
PVF @ 12%	1.00	0.893	0.797
	-42750000.00	7214802.00	36405206.00
NPV			870008.00

- (ii) Assuming that inflow funds are transferred at the end of the project i.e. second year.

Year	0	2
Cash Flows (CN¥)	-4500000.00	5472840.00
Exchange Rate (₹/ CN¥)	9.50	9.85
Cash Flows (₹)	-42750000.00	53907474.00
PVF	1.00	0.797
	-42750000.00	42964257.00
NPV		214257.00

Though in terms of CN¥ the NPV of the project is negative but in ₹ it has positive NPV due to weakening of ₹ in comparison of CN¥. Thus Opus can accept the project.

18.

Particulars	Option I (3 mths)	Option II (6 mths)
Amount borrowed	100000	100000
Pounds (£) obtained by converting at spot rate	100000/52.70 = 1897.53	100000/52.70 = 1897.53
Invest pound for the period	1.25%	4%
Amount of pound received at the end Of the period	1897.53 × 1.0125 = 1,921.25	1897.53 × 1.04 = 1,973.43
Convert pounds to ₹ At forward rate	1,921.25 × 52.80 = 1,01,442	1,973.43 × 53.10 = 1,04,789
Amount of Re. Loan to be repaid	100000 × 1.02 = 102000	100000 × 1.05 = 105000

Since the amount of Indian Rupees to be Received is less than the amount repaid in both cases there is no scope for covered interest arbitrage by borrowing in Indian Rupees.

19. The following table demonstrates the potential impact of the three possible schemes, on each set of shareholders:-

Number of Simpson Ltd.'s shares issued to shareholders of Wilson Ltd.	Exchange ratio [(1)/10,000 shares of Wilson Ltd.]	Number of Simpson Ltd.'s shares outstanding after merger [50,000+(1)]	Fraction of Simpson Ltd. (Post merger) owned by Wilson Ltd.'s shareholders [(1)/(3)]	Value of shares owned by Wilson Ltd.'s shareholders [(4)x 35,00,000]	Fraction of Simpson Ltd. (combined Post-merger owned by Simpson Ltd.'s shareholders [50,000/(3)]	Value of shares owned by Simpson Ltd.'s shareholders [(6) x 35,00,000]
PAPER - 2: STRATEGIC FINANCIAL MANAGEMENT (1)	(2)	(3)	(4)	(5)	(6)	(7)
20,000	2	70,000	2/7	10,00,000	5/7	25,00,000
25,000	2.5	75,000	1/3	11,66,667	2/3	23,33,333
30,000	3	80,000	3/8	13,12,500	5/8	21,87,500

Thus from above it is clear that except case of exchange ratio of 20000 shares, in remaining cases the value of shares will increase for both companies.

20. (a) Following are some of factors that affect bond's duration:
- (1) **Time to maturity:** Consider two bonds that each cost ₹ 1,000 and yield 7%. A bond that matures in one year would more quickly repay its true cost than a bond that matures in 10 years. As a result, the shorter-maturity bond would have a lower duration and less price risk. The longer the maturity, the higher the duration.
 - (2) **Coupon rate:** Coupon payment is a key factor in calculation of duration of bonds. If two identical bonds pay different coupons, the bond with the higher coupon will pay back its original cost quicker than the lower-yielding bond. The higher the coupon, the lower is the duration.
- (b) Portfolio management is a process and broadly it involves following five phases and each phase is an integral part of the whole process and the success of portfolio management depends upon the efficiency in carrying out each of these phases.
- (1) **Security Analysis:** Security analysis constitutes the initial phase of the portfolio formation process and consists in examining the risk-return characteristics of individual securities and also the correlation among them. A simple strategy in securities investment is to buy underpriced securities and sell overpriced securities. But the basic problem is how to identify underpriced and overpriced securities and this is what security analysis is all about. There are two alternative approaches to analyse any security viz. fundamental analysis and technical analysis. They are based on different premises and follow different techniques.
 - (2) **Portfolio Analysis:** Once the securities for investment have been identified, the next step is to combine these to form a suitable portfolio. Each such portfolio has its own specific risk and return characteristics which are not just the aggregates of the characteristics of the individual securities constituting it. The return and risk of each portfolio can be computed mathematically based on the risk-return profiles for the constituent securities and the pair-wise correlations among them.
 - (3) **Portfolio Selection:** The goal of a rational investor is to identify the Efficient Portfolios out of the whole set of Feasible Portfolios mentioned above and then to zero in on the Optimal Portfolio suiting his risk appetite. An Efficient Portfolio has the highest return among all Feasible Portfolios having identical Risk and has the lowest Risk among all Feasible Portfolios having identical Return.
 - (4) **Portfolio Revision:** Once an optimal portfolio has been constructed, it becomes necessary for the investor to constantly monitor the portfolio to ensure that it does not lose its optimality. In light of various developments in the market, the investor now has to revise his portfolio. This revision leads to addition (purchase) of some new securities and deletion (sale) of some of the

existing securities from the portfolio. The nature of securities and their proportion in the portfolio changes as a result of the revision.

- (5) **Portfolio Evaluation:** This process is concerned with assessing the performance of the portfolio over a selected period of time in terms of return and risk and it involves quantitative measurement of actual return realized and the risk borne by the portfolio over the period of investment. Various types of alternative measures of performance evaluation have been developed for use by investors and portfolio managers.
- (c) Benefits of International Portfolio Investment are as follows:
- (a) *Reduce Risk:* International investment aids to diversify risk as the gains from diversification within a country are therefore very much limited, because macro economic factors of different countries vary widely and do not follow the same phases of business cycles, different countries have securities of different industries in their market portfolio leading to correlation of expected returns from investment in different countries being lower than in a single country.
 - (b) *Raise Return through better Risk – Return Trade off :* International Investment aids to raise the return with a given risk and/or aids to lower the risk with a given rate of return. This is possible due to profitable investment opportunities being available in an enlarged situation and at the same time inter country dissimilarities reduce the quantum of risk.
- (d) Benefits of Debit cards are as follows:
- 1) Obtaining a debit card is often easier than obtaining a credit card.
 - 2) Using a debit card instead of writing cheques saves one from showing identification or giving his personal information at the time of the transaction.
 - 3) Using a debit card frees him from carrying cash or a cheque book.
 - 4) Using a debit card means he no longer has to stock up on traveller's cheques or cash when he travels
 - 5) Debit cards may be more readily accepted by merchants than cheques, in other states or countries wherever the card brand is accepted.
 - 6) The debit card is a quick, "pay now" product, giving one no grace period.
 - 7) Using a debit card may mean one has less protection than with a credit card purchase for items which are never delivered, are defective, or misrepresented. But, as with credit cards, one may dispute unauthorized charges or other mistakes within 60 days. One should contact the card issuer if a problem cannot be resolved with the merchant.
 - 8) Returning goods or canceling services purchased with a debit card is treated as if the purchase were made with cash or a cheque.

(e) Factors affects the selection of Mutual Funds is as follows:

- (1) *Past Performance* – The Net Asset Value is the yardstick for evaluating a Mutual Fund. The higher the NAV, the better it is. Performance is based on the growth of NAV during the referral period after taking into consideration Dividend paid.

$$\text{Growth} = (\text{NAV}_1 - \text{NAV}_0) + D_1 / \text{NAV}_0.$$

- (2) *Timing* – The timing when the mutual fund is raising money from the market is vital. In a bullish market, investment in mutual fund falls significantly in value whereas in a bearish market, it is the other way round where it registers growth. The turns in the market need to be observed.
- (3) *Size of Fund* – Managing a small sized fund and managing a large sized fund is not the same as it is not dependent on the product of numbers. Purchase through large sized fund may by itself push prices up while sale may push prices down, as large funds get squeezed both ways. So it is better to remain with medium sized funds.
- (4) *Age of Fund* – Longevity of the fund in business needs to be determined and its performance in rising, falling and steady markets have to be checked. Pedigree does not always matter as also success strategies in foreign markets.
- (5) *Largest Holding* – It is important to note where the largest holdings in mutual fund have been invested.
- (6) *Fund Manager* – One should have an idea of the person handling the fund management. A person of repute gives confidence to the investors.
- (7) *Expense Ratio* – SEBI has laid down the upper ceiling for Expense Ratio. A lower Expense Ratio will give a higher return which is better for an investor.
- (8) *PE Ratio* – The ratio indicates the weighted average PE Ratio of the stocks that constitute the fund portfolio with weights being given to the market value of holdings. It helps to identify the risk levels in which the mutual fund operates.
- (9) *Portfolio Turnover* – The fund manager decides as to when he should enter or quit the market. A very low portfolio turnover indicates that he is neither entering nor quitting the market very frequently. A high ratio, on the other hand, may suggest that too frequent moves have lead the fund manager to miss out on the next big wave of investments. A simple average of the portfolio turnover ratio of peer group updated by mutual fund tracking agencies may serve as a benchmark. The ratio is lower of annual purchase plus annual sale to average value of the portfolio.