Paper- 14: STRATEGIC FINANCIAL MANAGEMENT

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Full Marks: 100 **Time Allowed: 3 Hours**

This paper contains two sections **A** and **B**. **Section A** is compulsory and contains questionNo.1 for 20 marks. **Section B** contains question Nos. 2 to 8, each carrying 16 marks.

Answer any five questions from **Section B**.

Section – A [20 Marks]

1.Choose the correct option among four alternative answer.(1mark for correct choice,1 mark for justification). **[10×2= 20]**

(i) The following information is available for the Hypothetical Ltd: EPS = ₹5.00, D/P ratio = 40%, K_e at D/P ratio of 40% is 16%. Assuming that Gordon valuation model holds true, what rate of return should be earned on investments to ensure that that the market price per share is ₹50?

(a) 15%

(b) 20%

(c) 10%

(d) 30%

(ii) An investor buys one market lot of December ₹1,230 Nifty calls at ₹70 a call, and sells one market lot of December ₹1,300 Nifty calls for ₹34 a call. If the Nifty closes at ₹1.210 on the expiration date, what is the payoff from this spread position?

(a) ₹6,000

(b) ₹7,000

(c) ₹6,500

(d) ₹7,200

(iii) If the company's cost of capital is 15% and expected growth rate is 11%, calculate the market price if dividend of ₹ 4 is to be paid.

(a) ₹100

(b) ₹60

(c) ₹44

(d) ₹50

(iv) Calculate the NAV of Great Fund from the following data: Size of the fund ₹200 Crores, face value ₹10 per unit, market value of investments ₹280 Crores, receivables ₹2 Crores, accrued income ₹2 Crores, liabilities ₹1 Crore, accrued expenses ₹1 Crore

(a) ₹12 per unit

(b) ₹20 per unit

(c) ₹14.10 per unit

(d) ₹16 per unit

(v) A company wishes to earn real rate of 10% from its project, when the inflation recorded is 6%. What is the normal rate the company would earn?

(a) 6.6%

(b) 4%

(c) 16%

(d) 16.6%

(vi) You own a portfolio that is 60% invested in stock X, 25% in stock Y and balance in stock Z. The expected returns on these stocks are 12%, 16% and 19% respectively. What is the expected return on the portfolio?

(a) 15%

(b) 14.05%

(c) 20%

(d) 10%

(vii) A stock index currently stands at 350. The risk free interest rate is 8%p.a. (with continuous compounding) and the dividend yield on the index is 4%p.a. What should the futures price for a four-month contract be?

(a) ₹354

(b) ₹358

(c) ₹354.69

(d) ₹362

(viii) A stock currently sells at ₹120. The put option to sell the stocks sells at ₹134 and costs ₹18. Determine the time value of the option.

(a) ₹4

(b) ₹14

(c) ₹32

(d) ₹10

(ix) Value of an out of the money option is

(a) Zero

(b) Negative

(c) $(S_0 – E)$

(d) $(E – S_0)$

(x) XYZ stock has a beta of 0.95 and an expected return of 13.586%. The market portfolio has an expected return of 14.014%. What is the risk premium for XYZ's stock?

(a) 8.560%

(b) 5.454%

(c) 8.132%

(d) 1.378%

Answer:

(i) (b) 20%

P = E (1– b)/ (ke – br)
₹50 =₹5(1 – 0.6)/ (0.16 – 0.6r)
₹50 = ₹2/ (0.16 – 0.6r)
₹50(0.16 – 0.6r) =₹2
₹8 – 30r = ₹2
₹6 = 30r
Or, r = 6/30 =0.2= 20 per cent

(ii) (d)₹7,200

Since Nifty closes at ₹1,210 on the expiration date (lower than the exercise prices of ₹1,230 and ₹1,300), both the options are out-of-the-money. Therefore, neither the investor himself nor the call-buyer from him will exercise their call options. Therefore, the payoff from the spread is the amount he has paid on buying the call option and the amount he has received on selling the option. As the amount paid as premium is more than the amount received, he suffers loss of (₹70 – ₹34) × 200 = ₹7,200.

(iii) (a)₹100

Market price per share if dividend of ₹ 4 is to be paid

$$= P_0 = \frac{D_t}{K_e - g}$$

= 4 / (15 – 11) = 4 / 0.04 = ₹ 100

(iv) (c)₹14.10 per unit

$$NAV = \frac{\text{Market value of Investments} + \text{Receivables} + \text{Accrued Income} - \text{Liabilities} - \text{Accrued expenses}}{\text{Number of units outstanding}}$$

$$= \frac{280 + 2 + 2 - 1 - 1}{200/10} = ₹14.10 \text{ per unit}$$

(v) (d)16.6%

Nominal rate (n) = (1 + r) (1 + i) – 1
= (1 + 0.1) (1 + 0.06) – 1
= (1.1) (1.06) -1
= 0.166
= 16.6%

(vi) (b) 14.05%

We have $E_p = W_1E_1 + W_2E_2 + W_3E_3 + \ldots\ldots\ldots + W_nE_n$

Where W_1, W_2 etc are respective weights of Securities in the portfolio, E_1, E_2 etc are Expected return of Security 1 and Security 2 respectively.
Therefore, $E[R_p] = 0.60(0.12) + 0.25(0.16) + 0.15(0.19) = 0.1405$ i.e. 14.05%

(vii) (c)₹354.69
Stock Index = 350
R_f = 8%
Diviend Yield = 4%
Futures price = $S.e^{(r-d)T} = 350 \times e^{(0.08-0.04)4/12} = 354.69$

(viii) (a)₹4
Time value of option = (Option premium – Intrinsic value of the option, S– E)
= ₹18 – (₹134 –₹120) = ₹4

(ix) (a) Zero
Value of an out of the money option is zero.

(x) (c) 8.132%
Applying the SML equation to XYZ's stock,
$0.13586 = R_f + 0.95[0.14014 - R_f]$
$\Rightarrow R_f(1 - 0.95) = 0.13586 - 0.95*0.14014$
$\Rightarrow R_f = (0.13586 - 0.13313)/(0.05)$
Therefore, R_f = 5.454%
Risk premium for XYZ's stock = $E(R_i) - R_f = 0.13586 - 0.05454 = 8.132\%$

Section - B

Answer *any five*questions. **[16×5= 80]**

2. (a) Chembur Golf Academy is evaluating different golf practice equipment. The "Dimple-Max" equipment costs ₹45,000, has a three-year life, and costs ₹5,000 per year to operate. The relevant discount rate is 12%. Assume that the straight-line depreciation method is used and that the equipment is fully depreciated to zero. Furthermore, assume the equipment has a salvage value of ₹10,000 at the end of the project's life. The relevant tax rate for income and capital gains is 34%. All cash flows occur at the end of the year. What is the equivalent annual cost (EAC) of this equipment? [8]

(b)The Delta Corporation is considering an investment in one of the two mutually exclusive proposals: Project A which involves an initial outlay of ₹1,70,000 and Project B which has an outlay of ₹1,50,000. The Certainty-Equivalent Approach is employed in evaluating risky investments. The current yield on T-Bill is 0.05 and the company uses this as the riskless rate. The expected values of net cash flows with their respective certainty-equivalents are:

Year	Project A		Project B	
	Cash flow (₹thousand)	Certainty-equivalent	Cash flow (₹ thousand)	Certainty-equivalent
1	90	0.8	90	0.9
2	100	0.7	90	0.8
3	110	0.5	100	0.6

(i) Which project should be acceptable to the company?
(ii) Which project is riskier? How do you know?
(iii) If the company was to use the risk-adjusted discount rate method, which project would be analysed with higher rate? [8]

Answer:(a)

PV (Initial Investment) = -₹45,000
PV (Maintenance) = (1-T_c) C_1 PVIFA(r%,T)
=(1-0.34) (-`5000)PVIFA (12%,3)
= -₹7,926
PV (Depreciation Tax Shield) = (T_c) (Annual Depreciation Expenses) x PVIFA(r%,T)
= (0.34) (₹45,000/3) x PVIFA (12%, 3)
= ₹12,249
At the end of its life, the equipment will have a ₹10,000 salvage value. Since the equipment has been fully depreciated, a gain on the sale equal to the salvage value must be recognised.
After-tax salvage value = Salvage value – T_c (salvage value – book value)
= ₹10,000 – 0.34(₹10,000 –₹0)
= ₹6,600
PV(After-tax salvage value) = ₹6,600/ $(1.12)^3$
=₹4,698
The NPV of the equipment is the combination of the above cash flows.
NPV = - Initial Investment - PV (Maintenance) + PV (Depreciation Tax Shield) + PV (Salvage)
= -₹45,000–₹7,926 + ₹12,249 + ₹4,698
= -₹35,979
EAC = -₹35,979/PVIFA (12%, 3)
EAC = -₹14,980
The equivalent annual cost for the project is ₹14,980

Answer: (b)

(i) Determination of NPV of Project A

Year	CFAT (₹thousand)	CE	Adjusted CFAT (CFAT x CE) (₹thousand)	PV factor (at 0.05)	Total PV (₹)
1	90	0.8	72	0.952	68,544
2	100	0.7	70	0.907	63,490
3	110	0.5	55	0.864	47,520
Total PV					1,79,554
Less: Initial outlay					1,70,000
NPV					9,554

Determination of NPV of project B:

Year	CFAT (₹thousand)	CE	Adjusted CFAT (CFAT x CE) (₹ thousand)	PV factor (at 0.05)	Total PV (₹)
1	90	0.9	81	0.952	77,112
2	90	0.8	72	0.907	65,304
3	100	0.6	60	0.864	51,840
Total PV					1,94,256
Less: Initial outlay					1,50,000
NPV					44,256

The NPV being greater, Project B should be acceptable to the company.

(ii) Project A is riskier. It is because certainty-equivalent associated with expected CFAT of Project A is lower.
(iii) Project A being more risky would be analysed using a higher discount rate, if the company was to use risk-adjusted discount rate method.

3. (a) A mutual fund company has the following assets under it on the close of business as on:

Company	No. Of shares	1st February,2012 Market price per share	2ndFebruary,2012 Market price per share
L Ltd	20,000	20	20.5
M Ltd	30,000	312.4	360
N Ltd	20,000	361.2	383.1
P Ltd	60,000	505.1	503.9

Total no. of units 6,00,000

(i) Calculate NAV of the fund?

(ii) Following information is given:

Assuming one Mr. A, submits a cheque of ₹30,00,000 to the mutual fund and the fund manager of this company purchases 8,000 shares of M Ltd; and the balance amount is held in bank. In such a case, what would be the position of the fund?

(iii) Find new NAV of the fund as on 2nd February, 2012? [10]

(b) Given are the details of dividend & capital gains for a mutual fund with beginning and ending NAV for years 2002-04. Calculate the three year holding period return.

All amount in₹	2002	2003	2004	Total
Ending NAV	43.20	60.47	57.75	-
Purchase (offer) price	55	46.20	64.68	-
Dividends received	2.10	2.84	2.61	7.55
Capital gains distribution	1.83	6.26	4.32	12.41

[6]

Answer: (a)

NAV of the fund currently is the market value of securities divided by the outstanding number of units. In this problem, market value is:

Company	1st February,2012			2nd February,2012		
	No. Of shares	Market price per share	Value of securities	No. Of shares	Market price per share	Value of securities
L Ltd	20,000	20	4,00,000	20,000	20.5	4,10,000
M Ltd	30,000	312.4	93,72,000	38,000	360	1,36,80,000
N Ltd	20,000	361.2	72,24,000	20,000	383.1	76,62,000
P Ltd	60,000	505.1	3,03,06,000	60,000	503.9	3,02,34,000
			4,73,02,000	Cash = 30,00,000 – 8,000 x 312.4 = 5,00,800		5,19,86,000
Cash			0			5,00,800
Total NAV			4,73,02,000	Additional Units = 30,00,000/78.8367 = 38,053.34		5,24,86,800
Units			6,00,000			6,38,053.34
NAV per unit			78.8367			82.2608

Answer: (b)

All amount in ₹	2002	2003	2004	Total
Ending NAV	43.2	60.47	57.75	-
Purchase (offer) price	55	46.20	64.68	-
Net increase/(decrease) in price	(11.8)	14.27	(6.93)	-
Return for the year:				
Dividends received	2.1	2.84	2.61	7.55
Capital gains distribution	1.83	6.26	4.32	12.41
Net increase in price	(11.8)	14.27	(6.93)	-
Total return	(7.87)	23.37	0	
Holding period return : Total return/Purchase Price	-14.3%	50.58%	0%	

4. (a)The following information is supplied to you, about a company:

Earnings of the company	**₹15,00,000**
Dividends paid	**5,00,000**
Number of issued shares	**1,00,000**
Price earnings ratio	**10**
Rate of return on investment (%)	**15**

(i) Determine the theoretical market price of the share.

(ii) Are you satisfied with the current dividend policy of the Firm? If not, what should be the optimal dividend payment ratio in this case? [8]

(b)XYZ stock has a beta of 0.7 and a required return of 15%. The risk-free rate is 4.5%.

(i) What is the risk premium on the market portfolio?

(ii) What is the risk premium on XYZ's stock?

(iii) If the risk premium on the market portfolio increases by 2% points (e.g., from x% to x+2%), what is the new requited return for XYZ's stock?

Year	Dividend Yield = DPS/Share Price
III Year	14/278 = 0.050
II Year	17/294 = 0.058
I Year	18/326 = 0.055
Current Year	20/370 = 0.054
Total	0.217/4 = 0.054 or 5.4%

[8]

Answer: (a)

(i) $P = \frac{[₹\ 5+(0.15/0.10)\ (15-5)}{0.10} = \frac{[₹\ 5+1.5\ (10)}{0.10} = \frac{₹\ 20}{0.10}$ = ₹200

(ii) The Company's D/P ratio is not optimal. At 33.33 per cent D/P ratio, the price per share is ₹200. The zero per cent D/P ratio would be optimum, as at this ratio the value of the share would be maximum as shown below:

$$P = \frac{[0+0.15/0.10]\ [₹\ 15-0]}{0.10} = \frac{1.5\ [₹\ 15]}{0.10} = ₹\ 225$$

Working Notes:

(a) K_e is the reciprocal of P/E ratio = 1/0.10 = 10 per cent.

(b) EPS = ₹15,00,000/1,00,000 = ₹15.

(c) DPS = ₹5,00,000/1,00,000 = ₹5.

Answer: (b)

(i) Using the CAPM equation, $R_i = R_f + \beta_i RP_m$, where $RP_m$is the risk premium on market portfolio. $RP_m = R_m - R_f$
We have $0.15 = 0.045 + 0.7 \times RP_m$
So $RP_m = (0.15 – 0.045)/0.7 = 15\%$]
(ii) The risk premium on the stock is $RP_i = R_i – R_f = 0.15 – 0.045 = 10.5\%$
(iii) If the risk premium on the market portfolio increases to 17%.
The new required return for the stock is:
$R_i = 0.045 + 0.7*0.17 = 16.4\%$
(Alternatively, increase in required return = 0.7*0.02 = 1.4%, so new required return = 0.15 + 0.014 = 16.4%)

5. (a) The portfolio composition of Sainath is given below:

The beta of the equity portfolio is 0.73. Sainath wants to increase the beta of his portfolio to 1.02 as he expects uptrend in the market. The current Index futures are available at 1015 and multiple attached to it is 200. What is the number of futures contract he should buy/sell to achieve the required beta?

Equity	**₹ 80 lakh**
Cash/Cash equivalent	**₹ 25 lakh**
Total [8]	**₹ 105 lakh**

[8]

(b) A particular stock sells for ₹42. A call option on this stock is available with a strike price of ₹40 and an expiration date in six months. If the risk-free rate equals 10% and the standard deviation of the stock's return is 20%, what is the price of the call option using Black Scholes Model? What happens if stock price is ₹40? What is the value of put using Put Call parity? [8]

Answer: (a)

Portfolio details:
Equity composition = ₹ 80 lakhs
Cash ₹ 25 lakhs
Beta 0.73
Desired beta 1.02
Index futures are at 1015
Underlying Units = 200
We need to find the number of futures to be bought, as our intention is to increase beta.
The following equation must be satisfied:
80 lakhs × 0.73 + N × 1015 × 200= 105 lakhs × 1.02
N = 24 contracts

Answer: (b)

Using Black Scholes Model we know that the value of call is:

$C = SN(d_1) – Xe^{-rt,} N(d_2)$

Where $d_1 = \dfrac{\ln\left(\frac{S}{X}\right) + \left(r + \frac{\sigma^2}{2}\right) T}{\sigma\sqrt{T}}$ and $d_2 = d_1 – \sigma\sqrt{T}$

We are given S = 42, X = 40, t = 6m, r = 10%, σ = 20%

Therefore, $d_1 = \frac{\ln\left(\frac{42}{40}\right) + \left(0.1 + \frac{0.2^2}{2}\right) 0.5}{0.2\sqrt{0.5}} = 0.769$

And $d_2 = d_1 - 0.2\sqrt{0.5} = 0.628$

Solving we get, C = ₹4.73

If the stock price (S) changes to ₹40, the new option price would be ₹3.28. We have using put call parity:

$S + P = C + X e^{-rt}$

Substituting necessary values, we get value of put = ₹1.33

6. (a) ABC Textiles Limited places an order to buy textile machinery with an American company. As per the agreement, ABC Textiles Limited will be paying US $2,00,000 after 180 days. As the fluctuation in the spot rate of the US $ over next 180 days will impact the rupee cost of import, the Board of ABC Textiles Limited asks its finance manager to collect data from the currency forward market, money market, currency option market, etc. The board also asks a consultant to assess various possible dollar spot rates after six months.

The various findings are as follows:
(i) Possible spot rate of dollar after six months, as estimated by the consultant, is ₹61.25, ₹61.75, ₹62, ₹62.50, ₹62.90.
(ii) Spot rate of dollar as of today is ₹62/US$.
(iii) 180 day forward rate of dollar as of today is ₹62.48/US$.
(iv) Interest rates are as follows:

	India	USA
For 180 day deposit rate (p.a.)	7.5%	1.5%
For 180 day borrowing rate (p.a.)	8.0%	2.0%

(v) A call option on the dollar, which expires in 180 days, has an exercise price of ₹62/US$ and premium ₹0.52/US$.
(vi) A put option on dollar, which expires in 180 days, has an exercise of ₹62/US$ and premium of ₹0.04/US$.
Carry out a comparative analysis of the various outcomes (rupee cost of import) under the alternatives of (A) not hedging (B) forward hedging (C) money market hedging and (D) option hedging. [8]

(b)X Limited, an Indian company, has an export exposure of 10 million yen value at September-end. The yen is not directly quoted against the rupee. The current spot rates are USD/INR = 61.79 and USD/JPY = 102.00. It is estimated that the yen will depreciate to 115 levels and the rupee will depreciate against the dollar to ₹63.
Forward rate for September USD/Yen = 108 and USD/INR = 62.89.
You are required: (i) to calculate the expected loss if hedging is not done. How the position will change with the company taking forward cover?
(ii) If the spot rate on 30th September was eventually US$/¥ = 109 and USD/INR = 62.78, is the decision to take forward cover justified? [8]

Answer: (a)

Comparison of hedging alternative for ABC Textiles Limited.

ABC Textiles will need to purchase US$2,00,000 to fulfill its import obligation. It will do so by making a purchase in the spot market after 180 days. ABC textiles rupee outgo in this circumstance will be:

Expected Spot rate after 180 days (₹)	Rupee outgo to purchase US$2,00,000 (₹)
61.25/US$	1,22,50,000
61.75/US$	1,23,50,000
62.00/US$	1,24,00,000
62.50/US$	1,25,00,000
62.90/US$	1,25,80,000

Forward hedge:
Rupees needed to buy US$2,00,000 with forward contract = US$2,00,000 x ₹62.48/US$ = ₹1,24,96,000.
Money market hedge:
Borrow rupee, convert to US dollar, invest US dollar to receive US$2,00,000 in 180 days.
Amount in Us dollar to be invested = US$2,00,000/(1 + 0.015 x 180/360) = US$1,98,511.
Amount in rupees that need to be converted into US dollar for investing = US$1,98,511 x ₹62/US$ = ₹1,23,07,682.
Interest and principal owed in rupee loan to be returned after 180 days = ₹1,23,07,682 (1 + 0.08 x 180/360) = ₹1,27,99,990.
So the rupee outgo for ABC Textiles will be ₹1,27,99,990.
Option hedge:
Purchase call (assuming that the option is to be exercised on the day the US dollar are needed) exercised price is ₹62/US$; premium is ₹0.52/US$.

Possible spot rate after 180 days	Premium per unit paid for option	Exercise option	Total price paid per unit	Total price paid for US$2,00,000
61.25	0.52	No	61.77	1,23,54,000
61.75	0.52	No	62.27	1,24,54,000
62.00	0.52	No	62.52	1,25,04,000
62.50	0.52	Yes	62.52	1,25,04,000
62.90	0.52	yes	62.52	1,25,04,000

Answer: (b)

Since a direct quote for yen and rupee is not given, it is to be calculated by cross currency exchange rates.
INR/USD x USD/JPY = INR/JPY
61.79/1 x 1/102.00 = 61.79/102.00 = 0.6057
Spot rate on the date of export = 1 yen = ₹0.6057
Estimated rate on September 1 yen = ₹0.5478 (63/115)
Actual rate on September [1 yen = ₹0.5760] i.e., (62.78/109)
Forward rate on September [1 yen = ₹0.5823] i.e., (62.89/108)
(i) Calculation of expected loss without hedging:
Value of exports at the time of export is ₹0.6057 x ¥10million = ₹60,57,000.
Estimated payment to be received in September is ₹0.5478 x ¥10million = ₹54,78,000.
Loss is ₹60,57,000 –₹54,78,000 = ₹5,79,000
Hedging of loss under forward cover
Rupee value of exports (on the date of export) = ₹0.6057 x ¥10million = ₹60,57,000
Payment received under forward cover is ₹0.5823 x ¥10million = ₹58,23,000.
Loss is ₹60,57,000 –₹58,23,000 = ₹2,34,000.
By taking forward cover, loss of ₹3,45,000 (₹5,79,000 – ₹2,34,000) is reduced.
(ii) Since payment received under forward cover is higher at ₹58,23,000 vis-a-vis without any forward cover (₹57,60,000), the decision to take forward cover is justified.

7. (a) PTC needs to expand its facilities. To do so, the firm must acquire a machine costing ₹80,000.The machine can be leased or purchased. The firm is in the 40% tax bracket,

and its after-tax cost of debt is 5.4%. The terms of the lease and purchase plans are as follows:

Lease: The leasing arrangement requires end-year payments of ₹16,900 over 5years. The lessee will exercise its option to purchase the asset for ₹20,000 paid along with the final lease payment.

Purchase: If the firm purchase the machine, its cost of ₹80,000 will be financed with a 5-year, 9 loan requiring equal end-of-year payments of ₹20,567. The machine will be depreciated under WDV method 33%. The firm will pay ₹2,000 per year for a service contract that covers all maintenance costs; the firm will pay insurance and other costs. The firm plans to keep the equipment and use it beyond its 5-year recovery period for one more year.
(i) Determine the after-tax cash outflows of PTC under each alternative.
(ii) Find the PV of the after-tax cash outflows for each alternative using the after-tax cost of debt.
(iii) Which alternative, lease or purchase, would you recommend? Why? [8]

(b) Analyze the following information pertaining to two common stock investments, T Co and S Co. you are told that a 1-year T-Bill will have a rate of return of 5% over the next year. Also,information from an investment advising service lists the current beta for T Co as 1.68 and for S Co as 0.52.

Economy	Probability	Estimated Rate of Return %		
		T Co	S Co	Index
Recession	0.3	-20	5	-4
Average	0.2	15	6	11
Expansion	0.35	30	8	17
Boom	0.15	50	10	27

Required:
1. Calculate the expected rate of return for T Co, S Co and the Index.
2. Calculate the standard deviations in estimated rates of return for T Co, S Co and the Index.
3. Which is a better measure of risk for the common stock of T Co and S Co – the standard deviation you calculated in question 2 or the beta?
4. Based on the beta provided, what is the expected rate of return for T Co and S Co for the next year?
5. If you form a two-stock portfolio by investing ₹30,000 in T Co and ₹70,000 in S Co., what is the portfolio beta and expected rate of return? [8]

Answer: (a)

Leasing the machine:
Lease payment (paid in arrears): ₹16,900; N = 5 years;
Discount rate = After-tax cost of debt = 5.4%
Present value of lease cash flows
= PV of Lease rentals + 20,000 x PVIF (5.4%, 5)
=16,900 x 0.6 x 4.2821 + 20,000 x 0.7688
= ₹58,796
Note: Since all maintenance, insurance and other costs are to be borne by the lessee threes are irrelevant to us as lessee would bear these under both options viz. lease and purchase.
Purchase the machine:
Depreciation Schedule:

Year	Opening	Depreciation	Closing
1	80,000	26,400	53,600

2	53,600	17,688	35,912
3	35,912	11,851	24,061
4	24,061	7,940	16,121
5	16,121	5,320	10,801
6	10,801	3,564	7,237

Loan Interest:

Principal	Payment	Interest	Principal paid	Ending balance
80,000	20,567	7,200	13,367	66,633
66,633	20,567	5,997	14,570	52,063
52,063	20,567	4,686	15,881	36,182
36,182	20,567	3,256	17,311	18,871
18,871	20,567	1,696	18,871	0

Tax shield available = (Depreciation + Interest + Maintenance Cost)x Tax rate

Calculating of PV of purchase option:

	Year	1	2	3	4	5	6
A	Installment	20,567	20,567	20,567	20,567	20,567	0
B	Depreciation	26,400	17,688	11,851	7,940	5,320	3,564
C	Interest	7,200	5,997	4,686	3,256	1,696	
D	Maintenance	2,000	2,000	2,000	2,000	2,000	
E	Total = B + C + D	35,600	25,685	18,537	13,196	9,016	3,564
F	Tax shield = 0.4*E	14,240	10,274	7,415	5,278	3,606	1,426
G	Cash flow = A – F	6,327	10,293	13,152	15,289	16,961	-1,426
H	PV factor @ 5.4%	0.949	0.900	0.854	0.810	0.769	0.729
I	PV Cash flow = G*H	6,004	9,264	11,232	12,384	13,043	-1,039

PV of Net cash flows of Purchasing option = ₹50,888
It is better to purchase the machine than to go for lease.

Answer: (b)

1. Expected rate of return = $\sum p_i X_i$

Economy	Probability	Estimated Rate of Return %		
		T Co	S Co	Index
Recession	0.30	-20	5	-4
Average	0.20	15	6	11
Expansion	0.35	30	8	17
Boom	0.15	50	10	27
Expected Return		15	7	11

2. Standard deviation can be calculated using the formula:

$$\sigma_{TCo} = \sqrt{0.3(-0.20-0.15)^2 + 0.2(0.15-0.15)^2 + 0.35(0.30-0.15)^2 + 0.15(0.50-0.15)^2}$$

= 25.10%

$$\sigma_{SCo} = \sqrt{0.3(0.05-0.07)^2 + 0.2(0.06-0.07)^2 + 0.35(0.08-0.07)^2 + 0.15(0.10-0.07)^2}$$

= 1.76%

$$\sigma_{Index} = \sqrt{0.3(-0.04-0.11)^2 + 0.2(0.11-0.11)^2 + 0.35(0.17-0.11)^2 + 0.15(0.27-0.11)^2} =$$

10.89%

3. Beta is the better measure. This is because we would be rewarded for only the portion of the systematic risk which we take and beta is a measure of a systematic risk. Hence knowing beta helps us to know the rate of return.

4. We have been given beta of T Co & S Co as 1.68 & 0.52 respectively.

$E(R_i) = R_f + B_i [E(R_m) – (R_f)]$
Therefore for T Co we have $E(R_{TCo}) = 5 + 1.68(11-5) = 15.08\%$
And for S Co we have $E(R_{SCo}) = 5 + 0.52(11-5) = 8.12\%$.
5. If the investment `30000 &`70000 is made in T Co & S Co respectively, we have the proportions as 0.3 & 0.7, giving us the beta of $B_p = 0.3*1.68 + 0.7*0.52 = 0.87$
Therefore, $E(R_p) = R_f + B_P[E(R_m)-(R_f)] = 10.21\%$

8. Write short note on (*any four*) 4×4=16

(a) Who are the participants in the capital market?

(b) Futures Market

(c) What is Risk Management and mention four basic steps of it.

(d) What are the direct and indirect instruments that are used in the formulation and implementation of monetary policy?

(e) Who are the participants in Foreign Exchange Market?

Answer:

(a) Participants in the capital market are:

- Merchant Bankers
- Bankers to an Issue
- Registrar to an Issue
- Underwriters to the Issue
- Debenture Trustees
- Investment Banks
- Depositories
- Portfolio Managers
- Custodians

(b) Futures Market - It is an agreement between two parties to buy or sell a specified and standardized quantity and quality of an asset at certain time in the future at price agreed upon at the time of entering in to a contract on the futures exchange. It is entered on centralized trading platform of exchange. It is standardized in terms of quantity as specified by exchange. Contract price of futures contract is transparent as it is available on centralized trading screen of the exchange. Here valuation of mark-to-mark position is calculated as per the official closing price on daily basis and MTM margin requirement exists. Futures contract is more liquid as it is traded on the exchange. In futures contract the clearing house becomes the counter party to each transaction, which is called novation. Therefore, counter party risk is almost eliminated. A regulatory authority and the exchange regulates futures contract. Futures contract is generally cash settled but option of physical settlement is available. Delivery tendered in case of futures contract should be of standard quantity and quality as specified by the exchange.

(c) Risk management is defined as the process of understanding and managing the risks that an organization is inevitable subject to in attempting to achieve its corporate objectives.

Four basic steps of risk management are

- Risk identification – it involves identifying risk exposures of an organization, understanding their relevance in term of their impact on survival of the business and prioritizing them, and determining an appropriate level of risk tolerance for the business.
- Risk quantification – the next step is to quantify risk in termsof probability of loss and quantum of loss.
- Risk treatment- After quantification, specific strategies are adopted to mitigate or treat risk in order of priority.
- Monitoring risk treatment – Finally feedback on impact of risk mitigation is obtained to determine whether any modification of the risk management is needed, which means that taken actions should be continuously monitored and controlled to check up their results, compare them to the plan and introduce modification if required. Risk monitoring enables the company to forecast the level of risk and prepare the company's actions in future.

(d) (A) Direct Instruments – (i) Cash Reserve Ratio (Ii) Statutory Liquidity Ratio (Iii) Refinance Facilities

(B) Indirect Instruments – (i) Liquidity Adjustment Facility (Ii) Repo/Reverse Repo Rate (Iii) Open Market Operations (Iv)Standing Facility (V) Bank Rate (Vi) Market Stabilization Scheme

(e) Following are the participants of foreign exchange market:

- Commercial companies
- Central banks
- Hedge funds as speculators
- Investment management firms
- Retail foreign exchange traders
- Non-bank foreign exchange companies
- Money transfer/ remittance companies and bureau de change