



STRATEGIC FINANCIAL MANAGEMENT

Time Allowed: 3 Hours

Full Marks: 100

The figures in the margin on the right side indicate full marks.

SECTION – A (Compulsory)

1. Choose the correct option:

[15 x 2 = 30]

- (i) The Profitability Index of a project is 1.28 and its cost of investment is ₹2,50,000. The NPV of the project is _____.
(a) ₹75,000
(b) ₹ 80,000
(c) ₹70,000
(d) ₹65,000
- (ii) If project cost = ₹12,000, Annual cash flow = ₹4,500 Cost of capital = 14%, life = 4 years, PVIFA (14%, 4) = 2.9137, then the sensitivity with respect to the project cost is _____.
(a) 9.27 %
(b) 10.27 %
(c) 9.72%
(d) 10.72%
- (iii) Which of the following statements is correct?
(a) Expected NPV always provides risk-free value of the project
(b) Expected NPV incorporates both expected cash flows and their probabilities
(c) Expected NPV ignores risk altogether
(d) Expected NPV is always higher than actual NPV
- (iv) Under “securitisation process”, _____ are instruments which issued subsidiary company in respect of receivables of holding or parent company.
(a) Pass through certificate
(b) Pay through certificate
(c) Preferred stock certificate
(d) None of the above
- (v) Liquidity of a company generally measures _____.
(a) The ability of a company to pay its employees in a timely manner
(b) The ability to pay interest and principal on all debt
(c) The ability to pay dividends
(d) The ability to pay current liabilities
- (vi) The current dividend, market price and the annual dividend growth rate of a company are ₹2.50 per share, ₹50 per share and 5%, respectively. The capitalization rate of the equity will be _____.
(a) 0.0526
(b) 0.10
(c) 0.1050
(d) 0.1025



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- (vii) Mr. Pandey has formed a portfolio and the characteristics of his portfolio are given below:

Security	Cipla	Ranbaxy	Treasury	Bill Index fund
Weight (W_i)	0.07	0.25	0.25	0.43
Beta (β_i)	1.72	0.89	?	?

Beta of his Portfolio is _____.

- (a) 0.8512
(b) 0.9539
(c) 0.7729
(d) 1.5067
- (viii) A company has the following data:
Unlevered Beta (β_U) = 0.9
Debt/Equity Ratio (D/E) = 1.0
Tax rate (T) = 30%
What is the Levered Beta (β_L)?
(a) 0.9
(b) 1.26
(c) 1.53
(d) 1.80
- (ix) If the share of BA Ltd. (F. V. ₹10) quotes ₹920 on NSE, and the 3 months futures price quotes at ₹950, and the borrowing rate is given as 8% and the expected annual dividend yield is 15% p.a. payable before expiry, then the price of 3-month BA Ltd. futures would be _____.
(a) ₹948.40
(b) ₹939.90
(c) ₹938.50
(d) ₹936.90
- (x) An interest rate floor is primarily used to protect:
(a) Borrowers from rising interest rates
(b) Lenders from falling interest rates
(c) Equity investors from stock price decline
(d) Traders from foreign exchange risk
- (xi) A stock index currently stands at 7000. The risk-free interest rate is 8% p.a. continuously compounded and the dividend yield on the index is 4% p.a. What should be the futures price for a four-month contract? [Given $e^{(.08-.04)4/12} = 1.013423$]
(a) 7093.96
(b) 7097.34
(c) 7098.68
(d) 7099.25



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- (xii) Shibosai bond is a bond which is _____.
(a) Denominated in ¥ and issued outside Japan
(b) Denominated in a currency other than ¥ and issued in Japan
(c) Denominated in Japanese ¥ and issued under private placement in Japan
(d) Denominated in ¥ and issued by an overseas corporate to the public in Japan
- (xiii) The following various currency quotes are available from a leading Indian Bank:
₹/£: ₹ 75.31/75.33
£/\$: £0.6391/0.6398
\$/¥: \$0.01048/0.01052
The rate at which yen (¥) can be purchased with rupees will be _____.
(a) ₹ 0.5070
(b) ₹1.5030
(c) ₹1.7230
(d) None of the above
- (xiv) An Indian Company is planning to invest in USA. The annual rates of inflation are 8% in India and 3% in USA. If the spot rate is currently ₹73.50/1\$, what spot rate can you expect after 2 years, assuming the inflation rates will remain the same over 2 years?
(a) ₹66.85
(b) ₹80.81
(c) ₹70.09
(d) ₹77.07
- (xv) Which of the following is not a component of Digital Finance Ecosystem?
(a) Digital Infrastructure
(b) Digital Money
(c) Digital Liabilities
(d) Digital Financial Services

Answer:

(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xii)	(xiii)	(xiv)	(xv)
c	a	b	c	d	d	c	c	d	b	a	c	a	b	c



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SECTION – B

(Answer any five questions out of seven questions given. Each question carries 14 marks.)

[5 x 14 = 70]

2. (a) Narayan hospital is considering to purchase a machine for laboratory testing work which is priced at ₹2,00,000. The projected life of the machine is 8 years and has an expected salvage value of ₹18,000 at the end of 8th year. The annual operating cost of the machine is ₹22,500. It is expected to generate revenues of ₹1,20,000 per year for eight years. Presently, the hospital is outsourcing the laboratory testing work to its neighbour Test Centre and is earning commission income of ₹32,000 per annum, net of taxes.

Required:

ANALYSE whether it would be profitable for the hospital to purchase the machine. Give your recommendation under Net Present Value method. Consider tax @30%.

PV factors at 10% are given below:

Year	0	1	2	3	4	5	6	7	8
PV Factor	1	0.909	0.826	0.751	0.683	0.620	0.564	0.513	0.467

[7]

- (b) Excel Transport needs a truck for which it is considering the following two options:
- (i) Buy the asset for ₹3,00,000 by borrowing the amount @12% interest and repaying the same together with interest in 4 equal annual instalments.
- (ii) Acquiring the asset on lease with a payment of annual lease rentals of ₹90,000 per annum for 4 years.

The firm follows straight line method of depreciation and is under the income tax bracket of 30%. Life of the asset is 4 years.

Recommend which option – lease or buy, should the firm opt for?

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Answer:

- (a) Determination of Cash inflows

Particulars	₹
Sales Revenue	1,20,000
Less: Operating Cost	22,500
	97,500
Less: Depreciation (₹ 2,00,000 – ₹18,000)/8	22,750
Net Income	74,750
Less: Tax @ 30%	22,425
Earnings after Tax (EAT)	52,325
Add: Depreciation	22,750
Cash inflow after tax per annum	75,075
Less: Loss of Commission Income	32,000
Net Cash inflow after tax per annum	43,075



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In 8th Year :	
New Cash inflow after tax	39,075
Add: Salvage Value of Machine	18,000
Net Cash inflow in year 8	57,075

Calculation of Net Present Value (NPV)

Year	CFAT (₹)	PV Factor @10%	Present Value of Cash inflows (₹)
1 to 7	39,075	4.867	1,90,178.03
8	57,075	0.467	26,654.03
			2,16,832.06
Less: Cash Outflows			2,00,000.00
NPV			16,832.06

Advise: Since the net present value (NPV) is positive, the hospital may purchase the machine.

- (b) Applicable discount rate =
- $12(1 - 0.3) = 8.4\%$
- p.a.

Lease Option:Present value of after-tax lease rentals = $90,000 \times (1 - 0.3) \times \text{PVIFA}_{(8.4\%, 4 \text{ years})} = 63,000 \times 3.28 = ₹2,06,640$ **Buy Option**Annual instalment = $3,00,000 \div \text{PVIFA}_{(12\%, 4)} = 3,00,000 \div 3.037 = ₹98,782$ **Calculation of interest tax shield (in ₹)**

Opening Outstanding	Interest @ 12%	Instalment	Principal	Closing Outstanding	Tax savings on interest	PVIF @ 8.4%	PV of tax savings
3,00,000	36,000	98,782	62,782	2,37,218	10,800	0.9225	9,963
2,37,218	28,466	98,782	70,316	1,66,902	8,540	0.8510	7,268
1,66,902	20,028	98,782	78,754	88,148	6,008	0.7851	4,717
88,148	10,634	98,782	88,148	0	3,190	0.7242	2,310
Total							24,258

Calculation of depreciation tax shield (in ₹)

Depreciation	Tax savings	PVIF @ 8.4%	PV of tax savings
75,000	22,500	0.9225	20,756
75,000	22,500	0.8510	19,148
75,000	22,500	0.7851	17,665
75,000	22,500	0.7242	16,295
			73,864

Present value of cash flow under buy option

Particulars	₹
Present value of instalments ($98,782 \times 3.2828$)	3,24,282
Less: Interest tax shield	24,258
Less: Depreciation tax shield	73,864
Total	2,26,160

Recommendation: Since the present value of net cash outflow under leasing option is lower than that of buy option, leasing is preferable over buy option.



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3. (a) The Globe Manufacturing Company Ltd. is considering an investment in one of the two mutually exclusive proposals – Projects X and Y, which require cash outlays of ₹3,40,000 and ₹3,30,000 respectively. The certainty-equivalent (C.E.) approach is used in incorporating risk in capital budgeting decisions. The current yield on government bond is 10% and this be used as the riskless rate. The expected net cash flows and their certainty-equivalents are as follows:

Year-end	Project X		Project Y	
	Cash flow (₹)	C.E	Cash flow (₹)	C.E
1	1,80,000	0.8	1,80,000	0.9
2	2,00,000	0.7	1,80,000	0.8
3	2,00,000	0.5	2,00,000	0.7

Present value factors of ₹1 discounted at 10% at the end of year 1, 2 and 3 are 0.9091, 0.8264 and 0.7513 respectively.

Required:

- (i) Suggest which project should be accepted?
(ii) If risk adjusted discount rate method is used, which project would be analysed with a higher rate? [7]

- (b) TEXTON Ltd. is a major player in the textile industry of the country. The industry is expected to maintain high growth for a period of 5 years, after which it is expected to drop down. Currently, the company is distributing 40% of its profit as dividend to shareholders. The dividend payout ratio of the company is expected to remain at the current level for the next 5 years, after which it is expected to increase to 55%. The net profit margin of the company is currently 8% and is expected to remain at the same level for the next 5 years, after which it is expected to decrease to 5.7%. Currently, the company is able to generate sales of ₹2.50 for every ₹1.00 of assets employed, and it is expected to remain the same for the next 5 years. After that, the company is expected to generate sales of ₹3.50 for every ₹1.00 of assets employed. 50% of the assets of the company are financed with equity capital, and this is expected to remain the same in the future.

At present, the risk-free rate of return is 7%, and the market risk premium is 15.5%. The Beta of the company is currently 1.2. The current net worth of the company is ₹250 lakhs, and the number of shares outstanding is 2 lakhs. Assume that the market is in equilibrium.

(Calculation to be rounded off to 3 decimals)

Given: Present Value Interest Factors (PVIF):

Year	1	2	3	4	5
PVIF (20%)	0.833	0.694	0.579	0.482	0.402
PVIF (24%)	0.806	0.650	0.524	0.423	0.341
PVIF (25%)	0.800	0.640	0.512	0.410	0.328
PVIF (25.6%)	0.796	0.634	0.505	0.402	0.320

Required:

Analyze and assess the price per share of TEXTON Ltd. using the Dividend Discount Model (DDM).

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Answer:

(a) (i) Statement showing Net Present Value of Project X

Year-End	Cash flow (₹)	C.E	Adjusted Cash flow (₹)	Present value factor at 10%	Total present value (₹)
	a	b	c = a × b	d	e = c × d
1	1,80,000	0.8	1,44,000	0.9091	1,30,910
2	2,00,000	0.7	1,40,000	0.8264	1,15,696
3	2,00,000	0.5	1,00,000	0.7513	75,130
					3,21,736
Less: Initial investment					3,40,000
Net present value					(18,264)

Statement showing the Net Present Value of Project Y

Year-End	Cash flow (₹)	C.E	Adjusted Cash flow (₹)	Present value factor at 10%	Total present value (₹)
	a	b	c = a × b	d	e = c × d
1	1,80,000	0.9	1,62,000	0.9091	1,47,274
2	1,80,000	0.8	1,44,000	0.8264	1,19,002
3	2,00,000	0.7	1,40,000	0.7513	1,05,182
					3,71,458
Less: Initial investment					3,30,000
Net present value					41,458

Decision: Since the net present value of project Y is positive, the project Y should be accepted.

- (i) Since the certainty-equivalent (C.E.) Co-efficient of project X is lower than project Y, project X is riskier than project Y. Therefore, if risk adjusted discount rate method is used then project X would be analysed with a higher rate.

(b)

Particulars	Next 5 Years	After 5 Years
Pay-out ratio	40%	55%
Net profit margin	8%	5.70%
Asset turnover ratio	2.50	3.50
N W / T A	50%	50%
ROE	40%	39.9% = 40%
Growth rate	24%	17.955% or 18%



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Calculation of price per share:

Year	Growth Rate %	DPR %	EPS	DPS %
0	24	40	50	
1	24	40	62	24.8
2	24	40	76.88	30.752
3	24	40	95.33	38.132
4	24	40	118.21	47.284
5	24	40	146.58	58.632
6	18	55	172.97	95.134

Current EPS of the Company = $\frac{100}{2} = ₹50$

Cost of equity (K_e) = $7 + 1.2 (15.5) = 25.6\%$

Terminal value at the end of 5th year = $95.134 / (0.256 - 0.18) = 1251.76$

Alternatively: = $69.19 / (0.256 - 0.18) = 910.34$

Assessment of Price per Share at time 'O':

= $[19.7408 + 19.4967 + 19.2566 + 19.0081 + 419.325 \text{ or } 310.07] = ₹496.83 \text{ Or } = ₹387.57$

4. (a) **PALSON Ltd.** has issued a convertible bond with a face value of ₹1,00,000. The bond pays a coupon rate of 6% per annum, with interest payments made semi-annually. The bond has a term of 3 years and will be redeemed at ₹1,10,000 at maturity. Alternatively, the bondholder has the option to convert the bond into 50 shares at the end of the 3-year term. The required rate of return for the bond is 12% per annum.

Currently, the share price of PALSON Ltd is ₹2,000, and the shares are expected to grow at an annual rate of 8%. The shares also pay an annual dividend of ₹50 each.

Given: PV Factor Table

Year	PVIF (3%)	PVIF (6%)	PVIF (8%)	PVIF (12%)
1	0.971	0.943	0.926	0.893
2	0.943	0.89	0.857	0.797
3	0.915	0.84	0.794	0.712
4	0.888	0.792	0.735	0.636
5	0.863	0.747	0.681	0.567
6	0.837	0.705	0.630	0.507

Required:

- Analyze the value of the bond if it redeems at maturity.
- Assess the value of share at conversion.
- Assess the value of conversion option.
- Advise which option is more advantageous for the bondholder.

[7]



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- (b) Orange purchased 200 units of Oxygen Mutual fund at ₹45 per unit of 31st December 2023. In 2024, 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 2024 was ₹48 per unit
- (ii) Calculate the return for the period of one year assuming that the NAV as on 31st December 2024 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.

[7]

Answer:

- (a) (i) Interest payment = $100000 \times 6\% / 2 = ₹3,000$ semi annually
Present value of interest = $3000 \times 4.917 = ₹14,751$
Present value of redemption value = $110000 \times 0.705 = ₹ 77,550$
Value of Bond = $14751 + 77550 = ₹ 92,301$
- (ii) Expected Share Price at Maturity:
Price at the end of 3 years = $2000 (1 + 0.08)^3 = 2000 \times 1.26 = ₹2,520$
Value of Shares at conversion = $50 \times 2520 = ₹1,26,000$
- (iii) Value of conversion option:
Present value of dividend incomes = $50 \times 50 \times 2.402 = ₹6,005$
Present value of shares at conversion = $126000 \times 0.712 = ₹89,712$
Value of conversion option = $6005 + 89712 = ₹95,717$
- (iv) Advise:
The bondholder should choose to convert the bond into shares, as the value of conversion option (₹95,717) is higher than that of the current bond value (₹92,301).

- (b) (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		₹2.00
Total return		₹6.00
Holding period return:	$(₹6.00 / ₹45) \times 100 = 13.33\%$	



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- (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 × 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 × ₹48 = ₹10225.92
Price paid for 200 units at the beginning of the year	= 200 units × ₹45 = ₹9,000.00
Holding Period Return ₹ (10,225.92 – 9,000.00)	= ₹1,225.92
Holding Period Return	₹1,225 / ₹9,000 × 100 = 13.62%

5. (a) Returns on two portfolios, B and L, for the past 4 years are –

Year	1	2	3	4
Portfolio B	13.00%	13.50%	12.50%	14.00%
Portfolio L	14.35%	11.75%	13.60%	12.90%

Beta factor of the two portfolios is 1.3 and 1.2 respectively. If the market portfolio fetches 12% return and RBI Bonds, which are considered risk free, yield 5% return, which of the above two portfolios will an investor prefers? Justify your answer. [7]

- (b) Consider the following data on four mutual funds:

Funds	Alpha (%)	Systematic Risk (%)	Unsystematic Risk (%)	Correlation Matrix				
				W	X	Y	Z	Market
A	(4)	4	3	1	0.5	0.8	0.3	0.75
B	9	3	7	-	1.0	0.7	0.5	0.60
C	0	2	2	-	-	1	0.6	0.89
D	(12)	5	3	-	-	-	1.0	0.72

The market return during the period was 15% with a variance of 25%. The risk-free interest is 7%. Calculate Treynor, Sharpe and Jensen alpha and rank them. [7]

Answer:

- (a) 1. Computation of Expected rate of Return under CAPM

$E(R_X) = R_F + [\beta_X \times (R_M - R_F)]$ [Expected Return on Portfolio X]
 Risk Free Return R_F 5% [Treasury Bills]
 Return on Market Portfolio R_M 12% [Given]

Expected Return on	Portfolio B	Portfolio L
Beta Factor	1.30	1.20
Expected Return	$E(R_B) = R_F + [\beta_B \times (R_M - R_F)]$ $= 5\% + [1.30 \times (12\% - 5\%)]$ $= 5\% + [1.30 \times 7\%]$ $= 5\% + 9.1\% = 14.10\%$	$E(R_L) = R_F + [\beta_L \times (R_M - R_F)]$ $= 5\% + [1.20 \times (12\% - 5\%)]$ $= 5\% + [1.20 \times 7\%]$ $= 5\% + 8.4\% = 13.40\%$



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2. Computation on Alpha Factors

Year	Portfolio B		Portfolio L	
	Actual Return	Abnormal Return [AR _B]	Actual Return	Abnormal Return [AR _L]
(1)	(2)	(3) = (2) - E(R _B)	(4)	(5) = (4) - E(R _L)
1	13.00%	13.00% - 14.10% = (1.10%)	14.35%	14.35% - 13.40% = 0.95%
2	13.50%	13.50% - 14.10% = (0.60%)	11.75%	11.75% - 13.40% = (1.65%)
3	12.50%	12.50% - 14.10% = (1.60%)	13.60%	13.60% - 13.40% = 0.20%
4	14.00%	14.00% - 14.10% = (0.10%)	12.90%	12.90% - 13.40% = (0.50%)
		(3.40%)		(1.00%)

Alpha Factor:

$$\text{Portfolio B } \alpha_B = \sum AR_B \div n = (3.40\%) \div 4 \text{ Years} = (0.85\%)$$

$$\text{Portfolio L } \alpha_L = \sum AR_L \div n = (1.00\%) \div 4 \text{ Years} = (0.25\%)$$

3. Expected Return adjusted for Alpha

Alpha Adjusted Return = Return under CAPM + α

$$\text{Portfolio B} = E(R_B) + \alpha_B = 14.10\% - 0.85\% = 13.25\% \quad \text{Portfolio L} = E(R_L) + \alpha_L = 13.40\% - 0.25\% = 13.15\%$$

Conclusion: The Alpha for Security B is higher than L, indicating its better performance relative to L. Hence, an investor should prefer Portfolio B.

(b)

Name of the Funds	Correlation with Market	Standard Derivation	Systematic Risk	Unsystematic Risk	Beta
1	2	$3 = \sqrt{(4) + (5)}$	4	5	6
A	0.75	$\sqrt{7} = 2.65$	4	3	0.40
B	0.60	$\sqrt{10} = 3.16$	3	7	0.38
C	0.89	$\sqrt{4} = 2.00$	2	2	0.36
D	0.72	$\sqrt{8} = 2.83$	5	3	0.41

$$\text{Beta} = r \times (\sigma_F / \sigma_M)$$

Where r = correlation coefficient of funds with market

σ_F = Standard derivation of fund

σ_M = Standard derivation of market

$$\beta_A = 0.75 \times \frac{2.65}{5} = 0.40; \quad \beta_B = 0.60 \times \frac{3.16}{5} = 0.38; \quad \beta_C = 0.89 \times \frac{2}{5} = 0.36$$

$$\beta_D = 0.72 \times \frac{2.83}{5} = 0.41$$

$$\text{Return of A} = (R_A) = \alpha + R_f + (R_m - R_f) \times \beta_i = (4) + 7 + (15 - 7) \times 0.40 = 6.2\%$$

$$\text{Return of B} = (R_B) = 9 + 7 + [(15 - 7) \times 0.38] = 19.04\%$$

$$\text{Return of C} = (R_C) = 0 + 7 + [(15 - 7) \times 0.36] = 9.88\%$$

$$\text{Return of D} = (R_D) = (12) + 7 + [(15 - 7) \times 0.41] = -1.72\%$$



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Funds	Return (%)	Excess Return* ($R_i - R_f$)	Treynor Ratio **	Rank Under Treynor	Sharpe Ratio	Rank Under Sharpe	Jensen's Alpha Rank
A	6.20	-0.80	-2.0	3	-0.30	3	3
B	19.04	+12.04	31.68	1	3.81	1	1
C	9.88	+2.88	8.00	2	1.44	2	2
D	-1.72	- 8.72	- 21.26	4	-3.08	4	4

$$*R_i - R_f = (6.20 - 7.00) = -0.80$$

$$** \text{ Excess return/Beta (for A)} = -0.80 / 0.40$$

$$\begin{aligned} \text{Sharpe ratio} &= \frac{\text{Excess return}}{\text{S.D of the respective fund}} \\ &= \frac{R_i - R_f}{\sigma_i} \end{aligned}$$

$$\text{For A} = \frac{-0.80}{2.65} = -0.30$$

Ranking under all the methods are same.

6. (a) The price of Compact Stock of a face value of ₹10 on 31st December, 2024 was ₹414 and the futures price on the same stock on the same date i.e., 31st December, 2024 for March, 2025 was ₹444.

Other features of the contract and the related information are as follows:

- Time to expiration 3 months (0.25 year)
- Annual dividend on the stock of 30% payable before 31.3.2025.
- Borrowing Rate is 20 % p.a.

Based on the above information, calculate future price for Compact Stock on 31st December, 2024. Please also assess whether any arbitrage opportunity exists. [7]

- (b) A put and a call option each have an expiration date 6 months hence and an exercise price ₹9. The interest rate for the 6 months period is 3 percent.
- If the put has a market price of ₹2 and share is worth ₹10 per share, calculate the value of the call?
 - If the put has a market price of ₹2 and the call ₹4. calculate the value of the share per share?
 - If the call has a market value of ₹5 and market price of the share is ₹12 per share calculate the value of the put?



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Answer:

(a) Calculation of Future Price

Particulars	Remarks
Spot Price [S_0]	₹414
Expected rate of Dividend [y]	30% or 0.30
Borrowing Rate	20%
Tenor / Time Period [t] in Years	3 Months or 0.25 Year
Present Value of Dividend [I]	$= (30\% \times 10) \times e^{-0.20 \times 0.25}$
	$= (30\% \times 10) \div 1.05127$
	$= 3 \div 1.05127 = 2.8537$
Adjusted Spot Price [Spot Price- Present Value of Dividend] [$S_0 - I$]	$= 414 - 2.8537 = ₹411.1463$
Theoretical Forward Price [TFP] $TFP = [S_0 - I] \times e^{(r-y) \times t}$	$= ₹411.1463 \times e^{0.20 \times 0.25}$
	$= ₹411.1463 \times e^{0.05}$
	$= ₹411.1463 \times 1.05127 = ₹432.23$
3-Months Futures Contract Rate [AFP]	₹444
TFP Vs. AFP	AFP is Higher
Inference	AFP is overvalued
Recommended Action	Buy Spot. Sell Future

Cash Flows to Gain on the Arbitrage Opportunity

Activity Flow:

- Borrow ₹414 for a period of 3 months at the rate of 20% p.a.
- Buy the Stock at ₹414 at T_0
- Receive the Dividend at the time of 3 months [$₹10 \times 30\% = ₹3$]
- Sell the Index Futures at the Forward Price at the end of 3 months [₹444]
- Repay the amount of Loan with Interest at the end of the period.

Cash Flows arising out of the activities to gain on the Arbitrage:

Sl. No.	Particulars	₹
(a)	Borrow for a period of 3 months and Buy Stock at T_0	414
(b)	Receive the Dividend at the end of 3 months	3
(c)	Sell the Futures at the Forward Price at the end of 3 months	444
(d)	Repay the amount of borrowing together with Interest = $[414 \times e^{0.20 \times 0.25}]$	(435.23)
(e)	Net Cash Inflow $[(b + c) - d]$	11.77

(b) Under Put Call Parity -

→ Value of Call + Present Value of Exercise Price = Current Spot Price + Value of Put

→ $C + EP \times e^{-rt} = SP_0 + P$



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Case (i)	Case (ii)	Case (iii)
$\rightarrow C + EP \times e^{-rt} = SP_0 + P$	$\rightarrow C + EP \times e^{-rt} = SP_0 + P$	$\rightarrow C + EP \times e^{-rt} = SP_0 + P$
$\rightarrow C = SP_0 + P - EP \times e^{-rt}$	$\rightarrow SP_0 = C + EP \times e^{-rt} - P$	$\rightarrow P = C + EP \times e^{-rt} - SP_0$
$\rightarrow C = 10 + 2 - (9 \times e^{-0.03 \times (6/12)})$	$\rightarrow SP_0 = 4 + (9 \times e^{-0.03 \times (6/12)}) - 1$	$\rightarrow P = 5 + 9 \times e^{-0.03 \times (6/12)} - 12$
$\rightarrow C = 12 - (9 \div 1.01511)$	$\rightarrow SP_0 = 4 + (9 \div 1.01511) - 1$	$\rightarrow P = 5 + 8.86 - 12$
$\rightarrow C = 12 - 8.86 = 3.14$	$\rightarrow SP_0 = 11.86$	$\rightarrow P = 1.86$
Value of Call = ₹3.14	Value of Share = ₹11.86	Value of Put = ₹1.86

7. (a) M/s Virushka Electronics Ltd. exports air conditioners to Germany by importing all the components from Singapore. The company is exporting 2,400 units at a price of Euro 500 per unit. The cost of imported components is S\$ 800 per unit. The fixed cost and other variables cost per unit are ₹1,000 and ₹1,500 respectively. The cash flows in foreign currencies are due in six months.

The current exchange rates are as follows:

₹/Euro 51.50/55

₹/S\$ 27.20/25

After six months the exchange rates turn out as follows:

₹/Euro 52.00/05

₹/S\$ 27.70/75

- (1) You are required to calculate loss/gain due to transaction exposure.
- (2) Based on the following additional information calculate the loss/gain due to transaction and operating exposure if the contracted price of air conditioners is ₹25,000:

- (i) The current exchange rate changes to

₹/Euro 51.75/80

₹/S\$ 27.10/15

- (ii) Price elasticity of demand is estimated to be 1.75

- (iii) Payments and receipts are to be settled at the end of six months.

[7]

- (b) Zerox LTD, an Indian firm, is required to pay JPY 5,00,000 on 30th June. To hedge the foreign exchange risk, the firm is considering two alternatives: a forward market covers and a currency option contract.

On 1st April, the following quotations are available (JPY/INR):

<u>Instrument</u>	<u>Rate</u>
Spot	1.9516 / 1.9711
3 months forward	1.9726 / 1.9923

The forex currency option prices for purchasing JPY are as follows:

- Strike Price: JPY 2.125
- Call Option Premium (June): JPY 0.047
- Put Option Premium (June): JPY 0.098



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For any excess or balance of JPY not covered by the option, the firm would use the forward rate as the future spot rate.

Required: Recommend the cheaper hedging alternative for Zerox Ltd. and justify your choice. [7]

Answer:

(a) (1) Profit at current exchange rates

$$2400 [€ 500 \times ₹51.50 - (\$ 800 \times ₹27.25 + ₹1,000 + ₹1,500)]$$

$$2400 [₹25,750 - ₹24,300] = ₹34,80,000$$

Profit after change in exchange rates

$$2400 [€500 \times ₹52 - (\$ 800 \times ₹27.75 + ₹1000 + ₹1500)]$$

$$2400 [₹26,000 - ₹24,700] = ₹31,20,000$$

LOSS DUE TO TRANSACTION EXPOSURE

$$₹34,80,000 - ₹31,20,000 = ₹3,60,000$$

(2) Profit based on new exchange rates

$$2400 [₹25,000 - (800 \times ₹27.15 + ₹1,000 + ₹1,500)]$$

$$2400 [₹25,000 - ₹24,220] = ₹18,72,000$$

Profit after change in exchange rates at the end of six months

$$2400 [₹25,000 - (800 \times ₹27.75 + ₹1,000 + ₹1,500)]$$

$$2400 [₹25,000 - ₹24,700] = ₹7,20,000$$

Decline in profit due to transaction exposure

$$₹18,72,000 - ₹7,20,000 = ₹11,52,000$$

$$\text{Current price of each unit in €} = \frac{₹25,000}{₹51.50} = €485.44$$

$$\text{Price after change in Exchange Rate} = \frac{₹25,000}{₹51.75} = €483.09$$

Change in Price due to change in Exchange Rate

$$€485.44 - €483.09 = €2.35 \text{ or } (-) 0.48\%$$

Price elasticity of demand = 1.75

Increase in demand due to fall in price $0.48 \times 1.75 = 0.84\%$

Size of increased order = $2400 \times 1.0084 = 2420$ units

$$\text{Profit} = 2420 [₹25,000 - (800 \times ₹27.75 + ₹1,000 + ₹1,500)]$$

$$= 2420 [₹25,000 - ₹24,700] = ₹7,26,000$$

Therefore, decrease in profit due to operating exposure

$$₹18,72,000 - ₹7,26,000 = ₹11,46,000$$

Alternatively, if it is assumed that Fixed Cost shall not be changed with change in units then answer will be as follows:

$$\text{Fixed Cost} = 2400 [₹1,000] = ₹24,00,000$$

$$\text{Profit} = 2420 [₹25,000 - (800 \times ₹27.75 + ₹1,500)] - ₹24,00,000$$

$$= 2420 (₹1,300) - ₹24,00,000 = ₹7,46,000$$

Therefore, decrease in profit due to operating exposure

$$₹18,72,000 - ₹7,46,000 = ₹11,26,000$$



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(b) (i) Forward Cover

3-Month Forward Rate = 1.9726 JPY/INR

Convert to INR per JPY:

$$\text{INR per JPY} = \frac{1}{1.9726} = 0.5070 \text{ INR/JPY}$$

INR required to buy JPY 5,00,000:

$$5,00,000 \times 0.5070 = ₹2,53,500$$

(ii) Option Cover

To purchase JPY 5,00,000, Zerox Ltd. shall enter into a Put Option with a strike price of 2.125 JPY /INR

$$\text{Accordingly, outflow in INR } \left(\frac{\text{JPY} 5,00,000}{2.125} \right) = ₹2,35,294$$

Premium for the option:

$$\text{Premium in INR} = 5,00,000 \times 0.098 \div 1.9516 = ₹11,815$$

$$\text{Total outflow using option cover:} = ₹2,35,294 + ₹11,815 = ₹2,47,109$$

Recommendation:

Since outflow of cash is least in case of Option same should be opted for. Further if price of INR goes above JPY 2.125/INR the outflow shall further be reduced.

8. Short Notes on:

(a) Discuss the Advantages of Digital Financial Services. [5]

(b) Discuss the features of Global Depositary Receipts (GDRs). [5]

(c) Discuss the key parties involved in the process of securitization and explain their respective roles. [4]

Answer:

(a) The advantages of digital financial services include the following:

- (i) Improved customer experience: Digital technologies have changed the way financial services were provided. Now, customers enjoy a whole lot of information before the services can be availed.
- (ii) Ease of access: Because of the intervention of digital technology services can be accessed very easily. The customers need not to visit the branches of the service providers anymore. Everything is possible a click of a mouse.
- (iii) Streamlined operations: Financial services in this digital era is much more streamlined. Everything is so well planned. For example, in case of insurance services, from enquiry to customer on boarding, claim management to settlement – everything is now being done online and with minimum requirement of submission of physical documents. Even KYC (Know Your Customer) is also being done electronically.

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- (iv) Reduction in cost of delivery: Due to enhanced use of digital technology, companies are operating with minimum physical facilities and manpower. This has contributed heavily towards the profitability of the organisations. This savings is being shared with the customers in form of reduction in fees.
- (b) Features of Global Depositary Receipts (GDRs):**
- (i) Underlying Shares: Each GDR may represent one or more underlying share, which are physically held by the Custodian appointed by the Depositary Bank.
 - (ii) Entry in Company's Books: In the Company's books, the Depositary Bank's name appears as the holder of the shares.
 - (iii) Returns: Depositary gets the dividends from the Company (in local currency) and distributes them to the holders of the Depositary Receipts after converting into dollars at the going rate of exchange.
 - (iv) Negotiable: GDRs are exchangeable with the underlying share either at any time, or after the lapse of a particular period of time, generally 45 Days.
 - (v) Globally Marketed: GDRs are marketed globally without being confined to borders of any market or country as it can be traded in more than one country.
 - (vi) Settlement: GDRs are settled through CEDEL & Euro-Clear International Book Entry Systems.
- (c) A typical Securitization involves the following parties:**
- (i) Originator: An originator actually creates a securitized asset. This entity generates (originates) or owns the defined or identifiable cash flow (that is, an income stream from receivables). An example of an originator with assets that can be securitized is a retail bank which may securitize mortgages, automobile loans, credit card receivables, trade receivables etc.
 - (ii) Arranger: An originator usually appoints a financial institution to design and set up the securitization structure. It is known as arranger. It determines the risk profile of the receivables to create different tranches of security, sets up an SPV and also designs credit enhancement and liquidity support.
 - (iii) Special Purpose Vehicle: This is an entity established by the Originator to specifically purchase the assets and realize their off-balance-sheet treatment for legal and accounting purposes. This is generally established in form of a trust or a company and is, as far as legally possible, bankruptcy remote from the originator. The newly incorporated SPV (also called the issuer) issues securities to investors to fund the purchase of the isolated receivables from the originator.
 - (iv) Investors: In a securitization process, typically, financial institutions, insurance companies, pension funds, hedge funds, companies, high net worth individuals are the investors. Investors purchase the securities issued by the SPV according to their risk/return preferences.
 - (v) Servicers: SPV appoints the servicer to administer and collect the underlying receivables in the capacity of SPV's agent for a servicing fee stipulated under the servicing agreement.
 - (vi) Rating Agencies: Rating agencies rate the securities to indicate whether the SPV has a strong or weak capacity to pay interest and principal. They act as the ultimate appraiser of the underlying pool of collateral.