

PAPER – 2 : STRATEGIC FINANCIAL MANAGEMENT

Answer **all** questions.

Wherever appropriate, suitable assumption should be made by the candidates.

Working notes should form part of the answer.

Question 1

- (a) M/s ABC Ltd. is to acquire a personal computer with modem and a printer. Its price is Rs. 60,000. ABC Ltd. can borrow Rs. 60,000 from a commercial bank at 12% interest per annum to finance the purchase. The principal sum is to be repaid in 5 equal year-end instalments.

ABC Ltd. can also have the computer on lease for 5 years.

The firm seeks your advise to know the maximum lease rent payable at each year end. Consider the following additional information:

- (i) Interest on bank loan is payable at each year end.
- (ii) The full cost of the computer will be written off over the effective life of computer on a straight-line basis. This is allowed for tax purposes.
- (iii) At the end of year 5, the computer may be sold for Rs. 1,500 through a second -hand dealer, who will charge 8% commission on the sale proceeds.
- (iv) The company's effective tax rate is 30%.
- (v) The cost of capital is 11%.

Suggest the maximum annual lease rental for ABC Ltd. :

PV Factor at **11%**

Year	PVF
1	0.901
2	0.812
3	0.731
4	0.659
5	0.593

(12 Marks)

- (b) A mutual fund made an issue of 10,00,000 units of Rs. 10 each on January 01, 2008. No entry load was charged. It made the following investments:

	Rs.
50,000 Equity shares of Rs. 100 each @ Rs. 160	80,00,000
7% Government Securities	8,00,000
9% Debentures (Unlisted)	5,00,000

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10% Debentures (Listed)	<u>5,00,000</u>
	<u>98,00,000</u>

During the year, dividends of Rs, 12,00,000 were received on equity shares. Interest on all types of debt securities was received as and when due. At the end of the year equity shares and 10% debentures are quoted at 175% and 90% respectively. Other investments are at par.

Find out the Net Asset Value (NAV) per unit given that operating expenses paid during the year amounted to Rs. 5,00,000. Also find out the NAV, if the Mutual fund had distributed a dividend of Re. 0.80 per unit during the year to the unit holders. (8 Marks)

Answer

(a) Workings:

(i) Annual loan repayment: Rs. $\frac{60,000}{5}$ Rs. 12,000

(ii) Residual sale value at year 5 Rs. 1,500

(-) Commission at 8% 120

Profit on sale 1380

(-) Tax @ 30% 414

Net cash flow (Rs. 1,380 - Rs. 414) = Rs.966

(iii) Net cash outflow under loan option –

Year	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>Total</u>
	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Principal repayment	12,000	12,000	12,000	12,000	12,000	60,000
Payment of Interest	7,200	5,760	4,320	2,880	1,440	21,600
(-) Tax Savings @ 30% on depreciation	(3,600)	(3,600)	(3,600)	(3,600)	(3,600)	(18,000)
Tax savings on Interest	<u>(2,160)</u>	<u>(1,728)</u>	<u>(1,296)</u>	<u>(864)</u>	<u>(432)</u>	<u>(6,480)</u>
Net out flow	13,440	12,432	11,424	10,416	9,408	57,120
Discount factor at 11%	0.901	0.812	0.731	0.659	0.593	3.696
PV of cash outflow	12,109	10,095	8,351	6,864	5,579	42,998
Less: PV of Post tax inflow at the end of year 5 Rs. 966×0.593						(573)

PV of net Cash outflows in 5 years 42,425

Computation of Annual Lease Rentals:

PV of post tax Annual Lease Rentals in 5 years should not exceed Rs. 42,425.

Or say, PV of Post-tax Lease Rental for one year. Should not exceed

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$$\text{Rs. } \frac{42,425}{3.696} = \text{Rs. } 11,480$$

$$\begin{aligned} \text{Rs. } 11,480 \text{ post-tax} &= [\text{Rs. } 11,480 / (1-t)] \text{ pretax} \\ &= \text{Rs. } 11,480 / (1 - 0.30) = \text{Rs. } 16,400 \end{aligned}$$

Therefore, maximum pre-tax annual rental should be Rs.16,400

- (b) In order to find out the NAV, the cash balance at the end of the year is calculated as follows-

Cash balance in the beginning	Rs.
(Rs.100 lakhs – Rs. 98 lakhs)	2,00,000
Dividend Received	12,00,000
Interest on 7% Govt. Securities	56,000
Interest on 9% Debentures	45,000
Interest on 10% Debentures	50,000
	15,51,000
(-) Operating expenses	5,00,000
Net cash balance at the end	10,51,000

Calculation of NAV

	Rs.
Cash Balance	10,51,000
7% Govt. Securities (at par)	8,00,000
50,000 equity shares @ Rs. 175 each	87,50,000
9% Debentures (Unlisted) at cost	5,00,000
10% Debentures @90%	4,50,000
Total Assets	1,15,51,000
No. of Units	10,00,000
NAV per Unit	Rs.11.55
Calculation of NAV, if dividend of Re.0.80 is paid –	
Net Assets (Rs. 1,15,51,000 – Rs. 8,00,000)	Rs. 1,07,51,000
No. of Units	10,00,000
NAV per unit	Rs. 10.75

Question 2

- (a) An investor holds two stocks A and B. An analyst prepared ex-ante probability distribution for the possible economic scenarios and the conditional returns for two stocks and the market index as shown below:

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Economic scenario	Probability	Conditional Returns %		
		A	B	Market
Growth	0.40	25	20	18
Stagnation	0.30	10	15	13
Recession	0.30	-5	-8	-3

The risk free rate during the next year is expected to be around 11%. Determine whether the investor should liquidate his holdings in stocks A and B or on the contrary make fresh investments in them. CAPM assumptions are holding true. (10 Marks)

- (b) What are the limitations of Credit Rating? (4 Marks)
- (c) Following Financial data are available for PQR Ltd. for the year 2008 :

	(Rs. in lakh)
8% debentures	125
10% bonds (2007)	50
Equity shares (Rs. 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:

- Draw income statement for the year
- Calculate its sustainable growth rate
- Calculate the fair price of the Company's share using dividend discount model, and
- What is your opinion on investment in the company's share at current price?

(6 Marks)

Answer

(a) Expected Return on stock A = $E(A) = \sum_{i=G,S,R} P_i A_i$

(G,S & R, denotes Growth, Stagnation and Recession)

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$$(0.40)(25) + 0.30(10) + 0.30(-5) = 11.5\%$$

Expected Return on 'B'

$$(0.40 \times 20) + (0.30 \times 15) + 0.30 \times (-8) = 10.1\%$$

Expected Return on Market index

$$(0.40 \times 18) + (0.30 \times 13) + 0.30 \times (-3) = 10.2\%$$

Variance of Market index

$$(18 - 10.2)^2 (0.40) + (13 - 10.2)^2 (0.30) + (-3 - 10.2)^2 (0.30) \\ = 24.34 + 2.35 + 52.27 = 78.96\%$$

Covariance of stock A and Market Index M

$$\text{Cov. (AM)} = \sum_{i=G, S, R} ([A_i - E(A)][M_i - E(M)]P_i)$$

$$(25 - 11.5)(18 - 10.2)(0.40) + (10 - 11.5)(13 - 10.2)(0.30) + (-5 - 11.5)(-3 - 10.2)(0.30) \\ = 42.12 + (-1.26) + 65.34 = 106.2$$

Covariance of stock B and Market index M

$$(20 - 10.1)(18 - 10.2)(0.40) + (15 - 10.1)(13 - 10.2)(0.30) + (-8 - 10.1)(-3 - 10.2)(0.30) = 30.89 + 4.12 + 71.67 = 106.68$$

$$\text{Beta for stock A} = \frac{\text{CoV(AM)}}{\text{VAR(M)}} = \frac{106.20}{78.96} = 1.345$$

$$\text{Beta for Stock B} = \frac{\text{CoV(BM)}}{\text{VarM}} = \frac{106.68}{78.96} = 1.351$$

Required Return for A

$$R(A) = R_f + \beta(M - R_f)$$

$$11\% + 1.345(10.2 - 11)\% = 9.924\%$$

Required Return for B

$$11\% + 1.351(10.2 - 11)\% = 9.92\%$$

Alpha for Stock A

$$E(A) - R(A) \text{ i.e. } 11.5\% - 9.924\% = 1.576\%$$

Alpha for Stock B

$$E(B) - R(B) \text{ i.e. } 10.1\% - 9.92\% = 0.18\%$$

Since stock A and B both have positive Alpha, therefore, they are UNDERPRICED. The investor should make fresh investment in them.

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(b) Limitations of Credit Rating

Credit rating is a very important indicator for prudence but it suffers from certain limitations. Some of the limitations are:

- (i) **Conflict of Interest** – The rating agency collects fees from the entity it rates leading to a conflict of interest. Since the rating market is very competitive, there is a distant possibility of such conflict entering into the rating system.
- (ii) **Industry Specific rather than Company Specific** – Downgrades are linked to industry rather than company performance. Agencies give importance to macro aspects and not to micro ones; overreact to existing conditions which come from optimistic / pessimistic views arising out of up / down turns. At times, value judgments are not ruled out.
- (iii) **Rating Changes** – Ratings given to instruments can change over a period of time. They have to be kept under constant watch. Downgrading of an instrument may not be timely enough to keep investors educated over such matters.
- (iv) **Corporate Governance Issues** – Special attention is paid to:
 - (a) Rating agencies getting more of their revenues from a single service or group.
 - (b) Rating agencies enjoying a dominant market position. They may engage in aggressive competitive practices by refusing to rate a collateralized / securitized instrument or compel an issuer to pay for services rendered.
 - (c) Greater transparency in the rating process viz. in the disclosure of assumptions leading to a specific public rating.
- (v) **Basis of Rating** – Ratings are based on 'point of time' concept rather than on 'period of time' concept and thus do not provide a dynamic assessment.
- (vi) **Cost Benefit Analysis** – Since rating is mandatory, it becomes essential for entities to get themselves rated without carrying out cost benefit analysis.

(c) (i) Workings:

Asset turnover ratio	= 1.1
Total Assets	= Rs. 600
Turnover Rs. 600 lakhs × 11	= Rs. 660 lakhs
Effective market rate	= $\frac{\text{Interest}}{\text{Liabilities}} = 8\%$
Liabilities	= Rs. 125 lakhs + 50 lakhs = 175 lakh
Interest	= Rs. 175 lakhs × 0.08 = Rs. 14 lakh
Operating Margin	= 10%
Hence operating cost	= (1 - 0.10) Rs. 660 lakhs = Rs.594 lakh
Dividend Payout	= 16.67%
Tax rate	= 40%

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Income statement

	(Rs. 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) $SGR = G = ROE (1-b)$

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

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

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

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

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

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

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

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

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

Question 3

(a) Closing values of BSE Sensex from 6th to 17th day of the month of January of the year 200X were as follows :

Days	Date	Day	Sensex
1	6	THU	14522

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2	7	FRI	14925
3	8	SAT	No Trading
4	9	SUN	No Trading
5	10	MON	15222
6	11	TUE	16000
7	12	WED	16400
8	13	THU	17000
9	14	FRI	No Trading
10	15	SAT	No Trading
11	16	SUN	No Trading
12	17	MON	18000

Calculate Exponential Moving Average (EMA) of Sensex during the above period. The 30 days simple moving average of Sensex can be assumed as 15,000. The value of exponent for 30 days EMA is 0.062.

Give detailed analysis on the basis of your calculations. (6 Marks)

- (b) XYZ company has current earnings of Rs. 3 per share with 5,00,000 shares outstanding. The company plans to issue 40,000, 7% convertible preference shares of Rs. 50 each at par. The preference shares are convertible into 2 shares for each preference shares held. The equity share has a current market price of Rs. 21 per share.

- What is preference share's conversion value?
- What is conversion premium?
- Assuming that total earnings remain the same, calculate the effect of the issue on the basic earning per share (a) before conversion (b) after conversion.
- If profits after tax increases by Rs. 1 million what will be the basic EPS (a) before conversion and (b) on a fully diluted basis? (8 Marks)

- (c) What is the impact of GDRs on Indian Capital Market? (6 Marks)

Answer

(a)

Date	1 Sensex	2 EMA for Previous day	3 1-2	4 3×0.062	5 EMA 2 ± 4
6	14522	15000	(478)	(29.636)	14970.364

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7	14925	14970.364	(45.364)	(2.812)	14967.55
10	15222	14967.55	254.45	15.776	14983.32
11	16000	14983.32	1016.68	63.034	15046.354
12	16400	15046.354	1353.646	83.926	15130.28
13	17000	15130.28	1869.72	115.922	15246.203
17	18000	15246.203	2753.797	170.735	15416.938

Conclusion – The market is bullish. The market is likely to remain bullish for short term to medium term if other factors remain the same. On the basis of this indicator (EMA) the investors/brokers can take long position.

(b) (i) Conversion value of preference share

$$2 \times \text{Rs. } 21 = \text{Rs. } 42$$

Conversion Ratio x Market Price

(ii) Conversion Premium

$$(\text{Rs. } 50 / \text{Rs. } 42) - 1 = 19.05\%$$

(iii) Effect of the issue on basic EPS

BEFORE CONVERSION

Total (after tax) earnings $3 \times \text{Rs. } 5,00,000$	Rs. 15,00,000
Dividend or Preference shares	<u>Rs. 1,40,000</u>
Earnings available to equity holders	<u>Rs. 13,60,000</u>
No. of shares	5,00,000
EPS	Rs. 2.72

ON DILUTED BASIS

Earnings	Rs. 15,00,000
No of shares (Rs. 5,00,000 + Rs. 80,000)	Rs. 5,80,000
EPS	Rs. 2.59

(iv) EPS with increase in Profit

Earnings	Rs. 25,00,000
Dividend on Pref. shares	<u>Rs. 1,40,000</u>
Earning for equity shareholders	<u>Rs. 23,60,000</u>
No. of equity shares	5,00,000
EPS	Rs. 4.72

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On DILUTED BASIS

Earnings	Rs. 25,00,000
No. of shows	5,80,000
EPS	Rs. 4.31

(c) Impact of Global Depository Receipts (GDRs) on Indian Capital Market

After the globalization of the Indian economy, accessibility to vast amount of resources was available to the domestic corporate sector. One such accessibility was in terms of raising financial resources abroad by internationally prudent companies. Among others, GDRs were the most important source of finance from abroad at competitive cost. Global depository receipts are basically negotiable certificates denominated in US dollars, that represent a non- US company's publicly traded local currency (Indian rupee) equity shares. Companies in India, through the issue of depository receipts, have been able to tap global equity market to raise foreign currency funds by way of equity.

Since the inception of GDRs, a remarkable change in Indian capital market has been observed. Some of the changes are as follows:

- (i) Indian capital market to some extent is shifting from Bombay to Luxemburg and other foreign financial centres.
- (ii) There is arbitrage possibility in GDR issues. Since many Indian companies are actively trading on the London and the New York Exchanges and due to the existence of time differences, market news, sentiments etc. at times the prices of the depository receipts are traded at discounts or premiums to the underlying stock. This presents an arbitrage opportunity wherein the receipts can be bought abroad and sold in India at a higher price.
- (iii) Indian capital market is no longer independent from the rest of the world. This puts additional strain on the investors as they now need to keep updated with worldwide economic events.
- (iv) Indian retail investors are completely sidelined. Due to the placements of GDRs with Foreign Institutional Investor's on the basis free pricing, the retail investors can now no longer expect to make easy money on heavily discounted right/public issues.
- (v) A considerable amount of foreign investment has found its way in the Indian market which has improved liquidity in the capital market.
- (vi) Indian capital market has started to reverberate by world economic changes, good or bad.
- (vii) Indian capital market has not only been widened but deepened as well.
- (viii) It has now become necessary for Indian capital market to adopt international practices in its working including financial innovations.

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Question 4

(a) You have been provided the following Financial data of two companies:

	Krishna Ltd.	Rama Ltd.
Earnings after taxes	Rs. 7,00,000	Rs. 10,00,000
Equity shares (outstanding)	Rs. 2,00,000	Rs. 4,00,000
EPS	3.5	2.5
P/E ratio	10 times	14 times
Market price per share	Rs. 35	Rs. 35

Company Rama Ltd. is acquiring the company Krishna Ltd., exchanging its shares on a one-to-one basis for company Krishna Ltd. The exchange ratio is based on the market prices of the shares of the two companies.

Required:

- (i) What will be the EPS subsequent to merger?
 - (ii) What is the change in EPS for the shareholders of companies Rama Ltd. and Krishna Ltd.?
 - (iii) Determine the market value of the post-merger firm. PE ratio is likely to remain the same.
 - (iv) Ascertain the profits accruing to shareholders of both the companies. (10 Marks)
- (b) An investors is considering the purchase of the following Bond:

Face value	Rs. 100
Coupon rate	11%
Maturity	3 years

- (i) If he wants a yield of 13% what is the maximum price he should be ready to pay for?
 - (ii) If the Bond is selling for Rs.97.60, what would be his yield? (4 Marks)
- (c) A firm had been paid dividend at Rs.2 per share last year. The estimated growth of the dividends from the company is estimated to be 5% p.a. Determine the estimated market price of the equity share if the estimated growth rate of dividends (i) rises to 8%, and (ii) falls to 3%. Also find out the present market price of the share, given that the required rate of return of the equity investors is 15.5%. (6 Marks)

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Answer

(a)

(i)	Exchange Ratio	1:1
	New Shares to be issued	2,00,000
	Total shares of Rama Ltd. (4,00,000+2,00,000)	6,00,000
	Total earnings (Rs. 10,00,000 + Rs. 7,00,000)	Rs. 17,00,000
	New EPS (Rs. 17,00,000/6,00,000)	Rs. 2.83
(ii)	Existing EPS of Rama Ltd.	Rs. 2.50
	Increase in EPS of Rama Ltd (Rs. 2.83 – Rs. 2.50)	Rs. 0.33
	Existing EPS of Krishna Ltd.	Rs. 3.50
	Decrease in EPS of Krishna Ltd. (Rs. 3.50 – Rs. 2.83)	Rs. 0.67

(iii)	P/E ratio of new firm (expected to remain same)	14 times
	New market price (14 × Rs. 2.83)	Rs. 39.62
	Total No. of Shares	6,00,000
	Total market Capitalization (6,00,000 × Rs. 39.62)	Rs. 2,37,72,000
	Existing market capitalization (Rs. 70,00,000 + Rs. 1,40,00,000)	<u>Rs. 2,10,00,000</u>
	Total gain	<u>Rs. 27,72,000</u>

(iv)

	Rama Ltd.	Krishna Ltd	Total
No. of shares after merger	4,00,000	2,00,000	6,00,000
Market price	Rs. 39.62	Rs. 39.62	Rs. 39.62
Total Mkt. Values	Rs. 1,58,48,000	Rs. 79,24,000	Rs. 2,37,72,000
Existing Mkt. values	<u>Rs. 1,40,00,000</u>	<u>Rs. 70,00,000</u>	<u>Rs. 2,10,00,000</u>
Gain to share holders	18,48,000	9,24,000	27,72,000
or Rs. 27,72,000 ÷ 3 = Rs. 9,24,000 to Krishna Ltd. and Rs. 18,48,000 to Rama Ltd. (in 2: 1 ratio)			

(b) (i) Calculation of Maximum price

$$\begin{aligned}
 B_0 &= \text{Rs.}11 \times \text{PVIFA}(13\%,3) + \text{Rs.}100 \times \text{PVIF}(13\%,3) \\
 &= \text{Rs.}11 \times 2.361 + \text{Rs.}100 \times 0.693 \\
 &= \text{Rs.}25.97 + \text{Rs.}69.30 = \text{Rs.}95.27
 \end{aligned}$$

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(ii) Calculation of yield

$$\begin{aligned}\text{At 12\% the value} &= \text{Rs. } 11 \times \text{PVIFA (12\%, 3)} + 100 \times \text{PVIF (12\%, 3)} \\ &= \text{Rs. } 11 \times 2.402 + \text{Rs. } 100 \times 0.712 \\ &= \text{Rs. } 26.42 + \text{Rs. } 71.20 \\ &= \text{Rs. } 97.62\end{aligned}$$

It the bond is selling at Rs.97.60 which is more than the fair value, the YTM of the bond would be less than 13%. This value is almost equal to the amount price of Rs.97.60. Therefore, the YTM of the bond would be 12%.

Alternatively

$$\text{YTM} = \frac{\text{Rs. } 11 + \frac{(\text{Rs. } 100 - \text{Rs. } 97.60)}{3}}{\frac{(\text{Rs. } 100 + \text{Rs. } 97.60)}{2}} = 0.1194 \text{ or } 11.94\% \text{ say } 12\%$$

- (c) In this case the company has paid dividend of Rs.2 per share during the last year. The growth rate (g) is 5%. Then, the current year dividend (D_1) with the expected growth rate of 5% will be Rs.2.10

$$\begin{aligned}\text{The share price is } = P_0 &= \frac{D_1}{K_e - g} \\ &= \frac{\text{Rs. } 2.10}{0.155 - 0.05} \\ &= \text{Rs. } 20\end{aligned}$$

In case the growth rate rises to 8% then the dividend for the current year. (D_1) would be Rs. 2.16 and market price would be-

$$\begin{aligned}&= \frac{\text{Rs. } 2.16}{0.155 - 0.08} \\ &= \text{Rs. } 28.80\end{aligned}$$

In case growth rate falls to 3% then the dividend for the current year (D_1) would be Rs. 2.06 and market price would be-

$$\begin{aligned}&= \frac{\text{Rs. } 2.06}{0.155 - 0.03} \\ &= \text{Rs. } 16.48\end{aligned}$$

So, the market price of the share is expected to vary in response to change in expected growth rate is dividends.

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Question 5

- (a) *M/s Omega 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 Rs. 1,000 and Rs. 1,500 respectively. The cash flows in Foreign currencies are due in six months. The current exchange rates are as follows:*

<i>Rs/Euro</i>	<i>51.50/55</i>
<i>Rs/S\$</i>	<i>27.20/25</i>

After six months the exchange rates turn out as follows:

<i>Rs/Euro</i>	<i>52.00/05</i>
<i>Rs/S\$</i>	<i>27.70/75</i>

- (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 Rs.25,000 :*

- (i) *the current exchange rate changes to*

<i>Rs/Euro</i>	<i>51.75/80</i>
<i>Rs/S\$</i>	<i>27.10/15</i>

- (ii) *Price elasticity of demand is estimated to be 1.5*

- (iii) *Payments and receipts are to be settled at the end of six months. (12 Marks)*

- (b) *A study by a Mutual fund has revealed the following data in respect of three securities:*

<i>Security</i>	<i>σ (%)</i>	<i>Correlation with Index, P_m</i>
<i>A</i>	<i>20</i>	<i>0.60</i>
<i>B</i>	<i>18</i>	<i>0.95</i>
<i>C</i>	<i>12</i>	<i>0.75</i>

The standard deviation of market portfolio (BSE Sensex) is observed to be 15%.

- (i) *What is the sensitivity of returns of each stock with respect to the market?*
(ii) *What are the covariances among the various stocks?*
(iii) *What would be the risk of portfolio consisting of all the three stocks equally?*
(iv) *What is the beta of the portfolio consisting of equal investment in each stock?*
(v) *What is the total, systematic and unsystematic risk of the portfolio in (iv) ? (8 Marks)*

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Answer

(a) Profit at current exchange rates

$$2400 [\text{€ } 500 \times \text{S\$ } 51.50 - (\text{S\$ } 800 \times \text{Rs. } 27.25 + \text{Rs. } 1,000 + \text{Rs. } 1,500)]$$

$$2400 [\text{Rs. } 25,750 - \text{Rs. } 24,300] = \text{Rs. } 34,80,000$$

Profit after change in exchange rates

$$2400 [\text{€ } 500 \times \text{Rs. } 52 - (\text{S\$ } 800 \times \text{Rs. } 27.75 + \text{Rs. } 1000 + \text{Rs. } 1500)]$$

$$2400 [\text{Rs. } 26,000 - \text{Rs. } 24,700] = \text{Rs. } 31,20,000$$

LOSS DUE TO TRANSACTION EXPOSURE

$$\text{Rs. } 34,80,000 - \text{Rs. } 31,20,000 = \text{Rs. } 3,60,000$$

Profit based on new exchange rates

$$2400 [\text{Rs. } 25,000 - (800 \times \text{Rs. } 27.15 + \text{Rs. } 1,000 + \text{Rs. } 1,500)]$$

$$2400 [\text{Rs. } 25,000 - \text{Rs. } 24,220] = \text{Rs. } 18,72,000$$

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

$$2400 [\text{Rs. } 25,000 - (800 \times \text{Rs. } 27.75 + \text{Rs. } 1,000 + \text{Rs. } 1,500)]$$

$$2400 [\text{Rs. } 25,000 - \text{Rs. } 24,700] = \text{Rs. } 7,20,000$$

Decline in profit due to transaction exposure

$$\text{Rs. } 18,72,000 - \text{Rs. } 7,20,000 = \text{Rs. } 11,52,000$$

$$\text{Current price of each unit in S\$} = \frac{\text{Rs. } 25,000}{\text{Rs. } 51.50} = \text{S\$ } 485.44$$

$$\text{Price after change in Exch. Rate} = \frac{\text{Rs. } 25,000}{\text{Rs. } 51.75} = \text{S\$ } 483.09$$

Change in Price due to change in Exch. Rate

$$\text{S\$ } 485.44 - \text{S\$ } 483.09 = \text{S\$ } 2.35$$

$$\text{or } (-) 0.48\%$$

Price elasticity of demand = 1.5

$$\text{Increase in demand due to fall in price} \quad 0.48 \times 1.5 = 0.72\%$$

$$\text{Size of increased order} = 2400 \times 1.0072 = 2417 \text{ units}$$

$$\text{Profit} = 2417 [\text{Rs. } 25,000 - (800 \times \text{Rs. } 27.75 + \text{Rs. } 1,000 + \text{Rs. } 1,500)]$$

$$= 2417 [\text{Rs. } 25,000 - \text{Rs. } 24,700] = \text{Rs. } 7,25,100$$

$$\text{Therefore, decrease in profit due to operating exposure} \quad \text{Rs. } 18,72,000 - \text{Rs. } 7,25,100 = \text{Rs. } 11,46,900$$

FINAL (NEW) EXAMINATION: NOVEMBER, 2009

- (b) (i) Sensitivity of each stock with market is given by its beta.

Standard deviation of Index = 15%

Variance of market Index = 0.0225

Beta of stocks = $\sigma_i r / \sigma_m$

A = $20 \times 0.60 / 15 = 0.80$

B = $18 \times 0.95 / 15 = 1.14$

C = $12 \times 0.75 / 15 = 0.60$

- (ii) Covariance between any 2 stocks = $\beta_1 \beta_2 \sigma_m^2$

<u>Covariance matrix</u>			
Stock/Beta	0.80	1.14	0.60
A	400.000	205.200	108.000
B	205.200	324.000	153.900
C	108.000	153.900	144.000

- (iii) Total risk of the equally weighted portfolio = Variance = 200.244

- (iv) β of equally weighted portfolio = $\beta_p = \sum \beta_i / N = \frac{0.80 + 1.14 + 0.60}{3}$
 = 0.8467

- (v) Systematic Risk $\beta_p^2 \sigma_m^2 = 161.290$

Unsystematic Risk = Total Risk – Systematic Risk
 = 200.244 – 161.290
 = 38.954