## PAPER – 2: STRATEGIC FINANCIAL MANAGEMENT

## QUESTIONS

### Project Planning and Capital Budgeting

1. Project X and Project Y are under the evaluation of XY Co. The estimated cash flows and their probabilities are as below:

   Project X: Investment (year 0) ₹ 70 lakhs

| **Probability weights** | **0.30** | **0.40** | **0.30** |
|---|---|---|---|
| **Years** | **₹ lakhs** | **₹ lakhs** | **₹ lakhs** |
| 1 | 30 | 50 | 65 |
| 2 | 30 | 40 | 55 |
| 3 | 30 | 40 | 45 |

   Project Y: Investment (year 0) ₹ 80 lakhs.

| **Probability weighted** | **Annual cash flows through life** |
|---|---|
| | **₹ lakhs** |
| 0.20 | 40 |
| 0.50 | 45 |
| 0.30 | 50 |

   (i) Which project is better based on NPV, criterion with a discount rate of 10%?

   (ii) Using Hiller's Model compute the standard deviation of the present value distribution and analyze the inherent risk of the projects.

### Leasing Decisions

2. M/s ABC Ltd. is to acquire a personal computer with modem and a printer. Its price is ₹ 60,000. ABC Ltd. can borrow ₹ 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 advice 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 ₹ 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 |

**Dividend Decisions**

3. ABC Ltd. has 50,000 outstanding shares. The current market price per share is ₹ 100 each. It hopes to make a net income of ₹ 5,00,000 at the end of current year. The Company's Board is considering a dividend of ₹ 5 per share at the end of current financial year. The company needs to raise ₹ 10,00,000 for an approved investment expenditure. The company belongs to a risk class for which the capitalization rate is 10%. Show, how the M-M approach affects the value of firm if the dividends are paid or not paid.

**Derivative**

4. TMC Holding Ltd. has a portfolio of shares of diversified companies valued at ₹ 400 crore enters into a swap arrangement with None Bank on the terms that it will get 1.15% quarterly on notional principal of ₹ 80 crore in exchange of return on portfolio which is exactly tracking the Sensex which is presently 21600.

   You are required to determine the net payment to be received/ paid at the end of each quarter if Sensex turns out to be 21,860, 21,780, 22,080 and 21,960.

5. Mr. X established the following spread on the Delta Corporation's stock:

   (i) Purchased one 3-month call option with a premium of ₹ 30 and an exercise price of ₹ 550.

   (ii) Purchased one 3-month put option with a premium of ₹ 5 and an exercise price of ₹ 450.

   Delta Corporation's stock is currently selling at ₹ 500. Determine profit or loss, if the price of Delta Corporation:

   (i) remains at ₹ 500 after 3 months.

   (ii) falls at ₹ 350 after 3 months.

   (iii) rises to ₹600.

Assume the size option is 100 shares of Delta Corporation.

6. Calculate the price of 3 months PQR futures, if PQR (FV ₹10) quotes ₹220 on NSE and the three months future price quotes at ₹230 and the one month borrowing rate is given as 15 percent and the expected annual dividend yield is 25 percent per annum payable before expiry. Also examine arbitrage opportunities.

**Security Analysis and Valuation**

7. SAM Ltd. has just paid a dividend of ₹ 2 per share and it is expected to grow @ 6% p.a. After paying dividend, the Board declared to take up a project by retaining the next three annual dividends. It is expected that this project is of same risk as the existing projects. The results of this project will start coming from the 4th year onward from now. The dividends will then be ₹ 2.50 per share and will grow @ 7% p.a.

   An investor has 1,000 shares in SAM Ltd. and wants a receipt of at least ₹ 2,000 p.a. from this investment.

   Show that the market value of the share is affected by the decision of the Board. Also show as to how the investor can maintain his target receipt from the investment for first 3 years and improved income thereafter, given that the cost of capital of the firm is 8%.

8. The following data is available for a bond:

| | |
|---|---|
| Face Value | ₹ 1,000 |
| Coupon Rate | 11% |
| Years to Maturity | 6 |
| Redemption Value | ₹ 1,000 |
| Yield to Maturity | 15% |

   (Round-off your answers to 3 decimals)

   Calculate the following in respect of the bond:

   (i) Current Market Price.

   (ii) Duration of the Bond.

   (iii) Volatility of the Bond.

   (iv) Expected market price if increase in required yield is by 100 basis points.

   (v) Expected market price if decrease in required yield is by 75 basis points.

**Portfolio Theory**

9. The following information is available in respect of Security X

| | |
|---|---|
| Equilibrium Return | 15% |
| Market Return | 15% |

| | |
|---|---|
| 7% Treasury Bond Trading at | $140 |
| Covariance of Market Return and Security Return | 225% |
| Coefficient of Correlation | 0.75 |

You are required to determine the Standard Deviation of Market Return and Security Return.

10. 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:

| 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.

**Factoring**

11. The credit sale and receivables of A Ltd. at the end of the year are estimated at ₹ 3.2 crores and its average collection period is 90 days. The past experience indicates that bad-debt losses are 1.5% on Sales. The expenditure incurred by the firm in administering its receivable collection efforts are ₹ 5,00,000. A factor is prepared to buy the firm's receivables on recourse basis by charging 2% Commission. The factor will pay advance on receivables to the firm at an interest rate of 18% p.a. after withholding 10% as reserve. Calculate the effective cost of factoring to the Firm assuming 360 days a year.

**Mutual Funds**

12. On 1-4-2012 ABC Mutual Fund issued 20 lakh units at ₹ 10 per unit. Relevant initial expenses involved were ₹ 12 lakhs. It invested the fund so raised in capital market instruments to build a portfolio of ₹ 185 lakhs. During the month of April 2012 it disposed off some of the instruments costing ₹ 60 lakhs for ₹ 63 lakhs and used the proceeds in purchasing securities for ₹ 56 lakhs. Fund management expenses for the month of April 2012 were ₹ 8 lakhs of which 10% was in arrears. In April 2012 the fund earned dividends amounting to ₹ 2 lakhs and it distributed 80% of the realized earnings. On 30-4-2012 the market value of the portfolio was ₹ 198 lakhs.

Mr. Akash, an investor, subscribed to 100 units on 1-4-2012 and disposed off the same at closing NAV on 30-4-2012. What was his annual rate of earning?

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

| Particulars | ₹ |
|---|---|
| 50,000 Equity shares of ₹ 100 each @ ₹ 160 | 80,00,000 |
| 7% Government Securities | 8,00,000 |
| 9% Debentures (Unlisted) | 5,00,000 |
| 10% Debentures (Listed) | 5,00,000 |
| | 98,00,000 |

During the year, dividends of ₹ 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 ₹ 5,00,000. Also find out the NAV, if the Mutual fund had distributed a dividend of ₹ 0.80 per unit during the year to the unit holders.

**Money Market Operations**

14. From the following particulars, calculate the effective rate of interest p.a. as well as the total cost of funds to Bhaskar Ltd., which is planning a CP issue:

| | |
|---|---|
| Issue Price of CP | ₹ 97,550 |
| Face Value | ₹ 1,00,000 |
| Maturity Period | 3 Months |
| Issue Expenses: | |
| Brokerage | 0.15% for 3 months |
| Rating Charges | 0.50% p.a. |
| Stamp Duty | 0.175% for 3 months |

**International Financial Management**

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

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

Estimated projected cash flows, in real terms, in India as well as African country for

the first three years of the project are as follows:

| | Year – 0 | Year – 1 | Year – 2 | Year - 3 |
|---|---|---|---|---|
| Cash flows in Indian ₹ (000) | -50,000 | -1,500 | -2,000 | -2,500 |
| Cash flows in African Rands (000) | -2,00,000 | +50,000 | +70,000 | +90,000 |

XY Ltd. assumes the year 3 nominal cash flows will continue to be earned each year indefinitely. It evaluates all investments using nominal cash flows and a nominal discounting rate. The present exchange rate is African Rand 6 to ₹ 1.

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

(i) African Rand cash flows are converted into rupees and discounted at a risk adjusted rate.

(ii) All cash flows for these projects will be discounted at a rate of 20% to reflect it's high risk.

(iii) Ignore taxation.

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

**Foreign Exchange Exposure and Risk Management**

16. NP and Co. has imported goods for US $ 7,00,000. The amount is payable after three months. The company has also exported goods for US $ 4,50,000 and this amount is receivable in two months. For receivable amount a forward contract is already taken at ₹ 48.90.

The market rates for Rupee and Dollar are as under:

| | |
|---|---|
| Spot | ₹ 48.50/70 |
| Two months | 25/30 points |
| Three months | 40/45 points |

The company wants to cover the risk and it has two options as under:

(A) To cover payables in the forward market and

(B) To lag the receivables by one month and cover the risk only for the net amount. No interest for delaying the receivables is earned. Evaluate both the options if the cost of Rupee Funds is 12%. Which option is preferable?

17. Your bank's London office has surplus funds to the extent of USD 5,00,000/- for a period of 3 months. The cost of the funds to the bank is 4% p.a. It proposes to invest these funds in London, New York or Frankfurt and obtain the best yield, without any exchange risk to the bank. The following rates of interest are available at the three centres for investment of domestic funds there at for a period of 3 months.

| | |
|---|---|
| London | 5 % p.a. |
| New York | 8% p.a. |
| Frankfurt | 3% p.a. |

The market rates in London for US dollars and Euro are as under:

| | |
|---|---|
| London on New York | |
| Spot | 1.5350/90 |
| 1 month | 15/18 |
| 2 month | 30/35 |
| 3 months | 80/85 |
| London on Frankfurt | |
| Spot | 1.8260/90 |
| 1 month | 60/55 |
| 2 month | 95/90 |
| 3 month | 145/140 |

At which centre, will be investment be made & what will be the net gain (to the nearest pound) to the bank on the invested funds?

**Mergers and Acquisition**

18. Using the chop-shop approach (or Break-up value approach), assign a value for Cranberry Ltd. whose stock is currently trading at a total market price of €4 million. For Cranberry Ltd, the accounting data set forth three business segments: consumer wholesale, retail and general centers. Data for the firm's three segments are as follows:

| Business Segment | Segment Sales | Segment Assets | Segment Operating Income |
|---|---|---|---|
| Wholesale | €225,000 | €600,000 | €75,000 |
| Retail | €720,000 | €500,000 | €150,000 |
| General | € 2,500,000 | €4,000,000 | €700,000 |

Industry data for "pure-play" firms have been compiled and are summarized as follows:

| Business Segment | Sales/ Capitalization | Assets/ Capitalization | Operating Income/ Capitalization |
|---|---|---|---|
| Wholesale | 1.18 | 1.43 | 0.11 |
| Retail | 0.83 | 1.43 | 0.125 |
| General | 1.25 | 1.43 | 0.25 |

19. The following information is provided related to the acquiring Firm Mark Limited and the target Firm Mask Limited:

| | Firm Mark Limited | Firm Mask Limited |
|---|---|---|
| Earning after tax (₹) | 2,000 lakhs | 400 lakhs |
| Number of shares outstanding | 200 lakhs | 100 lakhs |
| P/E ratio (times) | 10 | 5 |

Required:

(i) What is the Swap Ratio based on current market prices?

(ii) What is the EPS of Mark Limited after acquisition?

(iii) What is the expected market price per share of Mark Limited after acquisition, assuming P/E ratio of Mark Limited remains unchanged?

(iv) Determine the market value of the merged firm.

(v) Calculate gain/loss for shareholders of the two independent companies after acquisition.

20. Write short notes on:

(a) Interface of Financial Policy and Strategic Management

(b) Social Cost Benefit Analysis in relation to evaluation of an industrial project

(c) Green Shoe Option

(d) Debt/Asset Securitization

(e) Forfaiting versus Export Factoring

## SUGGESTED ANSWERS/HINTS

**1. (i) Calculation of NPV of XY Co.:**

| Project X | | *Cash flow* | *PVF* | *PV* |
|---|---|---|---|---|
| *Year* | | | | |
| 1 | (30 × 0.3) + (50 × 0.4) + (65 × 0.3) | 48.5 | 0.909 | 44.09 |
| 2 | (30 × 0.3) + (40 × 0.4) + (55 × 0.3) | 41.5 | 0.826 | 34.28 |
| 3 | (30 × 0.3) + (40 × 0.4) + (45 × 0.3) | 38.5 | 0.751 | 28.91 |
| | | | | 107.28 |
| | NPV: (107.28 – 70.00) = | | | (+) 37.28 |

Project Y (For 1-3 Years)

| | | | | |
|---|---|---|---|---|
| 1-3 | (40 × 0.2) + (45 × 0.5) + (50 × 0.3) | 45.5 | 2.487 | 113.16 |
| | NPV (113.16 – 80.00) | | | (+) 33.16 |

**(ii)** Calculation of Standard deviation σ

As per Hiller's model

$$M = \sum_{i=0}^{n} (1+r)^{-1} Mi$$

$$\sigma^2 = \sum_{i=0}^{n} (1+r)^{-2i} \sigma_i^2$$

Hence

Project X

Year

1 $\sqrt{(30-48.5)^2 0.30 + (50-48.5)^2 0.40 + (65-48.5)^2 0.30}$ $= \sqrt{185.25}$ =13.61

2 $\sqrt{(30-41.5)^2 0.30 + (40-41.5)^2 0.40 + (55-41.5)^2 0.30}$ $= \sqrt{95.25}$ = 9.76

3 $\sqrt{(30-38.5)^2 0.30 + (40-38.5)^2 0.40 + (45-38.5)^2 0.30}$ $= \sqrt{35.25}$ = 5.94

Standard Deviation about the expected value

$$= \sqrt{\frac{185.25}{(1+0.10)^2} + \frac{95.25}{(1+0.10)^4} + \frac{35.25}{(1+0.10)^6}}$$

$$= \sqrt{\frac{185.25}{1.21} + \frac{95.25}{1.4641} + \frac{35.25}{1.7716}} = \sqrt{153.10+65.06+19.90}$$

$$= \sqrt{238.06} = 15.43$$

Project Y (For 1-3 Years)

$$\sqrt{(40-45.5)^2 0.20 + (45-45.5)^2 0.50 + (50-45.5)^2 0.30} \quad = \sqrt{12.25} \quad = 3.50$$

Standard Deviation about the expected value

$$= \sqrt{\frac{12.25}{(1+0.10)^2} + \frac{12.25}{(1+0.10)^4} + \frac{12.25}{(1+0.10)^6}}$$

$$= \sqrt{\frac{12.25}{1.21} + \frac{12.25}{1.4641} + \frac{12.25}{1.7716}} = \sqrt{10.12+8.37+6.91}$$

$$= \sqrt{25.4} = 5.03$$

***Analysis:*** Project Y is less risky as its Standard Deviation is less than Project X.

**2. Workings**

| | | |
|---|---|---|
| (i) | Annual loan repayment: ₹ $\frac{60,000}{5}$ | ₹ 12,000 |
| (ii) | Residual sale value at year 5 | ₹ 1,500 |
| | (-) Commission at 8% | 120 |
| | Profit on sale | 1380 |
| | (-) Tax @ 30% | 414 |
| | Net cash flow (₹ 1,380 - ₹ 414) | ₹ 966 |

(iii) Net cash outflow under loan option –

| Year | 1 (₹) | 2 (₹) | 3 (₹) | 4 (₹) | 5 (₹) | Total (₹) |
|---|---|---|---|---|---|---|
| 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 | (2,160) | (1,728) | (1,296) | (864) | (432) | (6,480) |
| 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 (₹ 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 ₹ 42,425.

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

$₹ \frac{42,425}{3.696} = ₹11,479$

₹11479 post-tax = [ ₹ 11,479/(1-t)] pretax

= ₹ 11,479/(1 - 0.30) = ₹16,398

Therefore, maximum pre-tax annual rental should be ₹16,398

**3. A When dividend is paid**

(a) Price per share at the end of year 1

$100 = \frac{1}{1.10}(₹ 5 + P_1)$

$110 = ₹ 5 + P_1$

$P_1 = 105$

(b) Amount required to be raised from issue of new shares

₹ 10,00,000 – (₹ 5,00,000 – ₹ 2,50,000)

₹ 10,00,000 – ₹ 2,50,000 = ₹ 7,50,000

(c) Number of additional shares to be issued

$\frac{7,50,000}{105} = \frac{1,50,000}{21}$ shares or say 7143 shares

(d) Value of ABC Ltd.

(Number of shares × Expected Price per share)

i.e., (50,000 + 7,143) × ₹ 105 = ₹ 60,00,015

**B When dividend is not paid**

(a) Price per share at the end of year 1

$$100 = \frac{P_1}{1.10}$$

$P_1 = 110$

(b) Amount required to be raised from issue of new shares

₹ 10,00,000 – ₹ 5,00,000 = ₹ 5,00,000

(c) Number of additional shares to be issued

$\frac{5,00,000}{110} = \frac{50,000}{11}$ shares or say 4545 shares.

(d) Value of ABC Ltd.,

(50,000 + 4,545) × ₹110

= ₹ 59,99,950

Thus, as per M.M. approach the value of firm in both situations will be the same.

**4.**

| Qtrs. (1) | Sensex (2) | Sensex Return (%) (3) | Amount Payable (₹ Crore) (4) | Fixed Return (Receivable) (₹ Crore) (5) | Net (₹ Crore) (5) – (4) |
|---|---|---|---|---|---|
| 0 | 21,600 | - | - | - | - |
| 1 | 21,860 | 1.2037 | 4.8148 | 4.6000 | - 0.2148 |
| 2 | 21,780 | -0.3660 | -1.4640 | 4.6000 | 6.0640 |
| 3 | 22,080 | 1.3774 | 5.5096 | 4.6000 | - 0.9096 |
| 4 | 21,960 | -0.5435 | -2.1740 | 4.6000 | 6.7740 |

**5. (i)** Total premium paid on purchasing a call and put option

= (₹30 per share × 100) + (₹5 per share × 100).

= 3,000 + 500 = ₹3,500

In this case, X exercises neither the call option nor the put option as both will result in a loss for him.

Ending value = - ₹ 3,500 + zero gain = - ₹ 3,500

i.e. Net loss = ₹ 3,500

**(ii)** Since the price of the stock is below the exercise price of the call, the call will not be exercised. Only put is valuable and is exercised.

Total premium paid = ₹3,500

Ending value = – ₹ 3,500 + ₹[(450 – 350) × 100] = – ₹ 3,500 + ₹ 10,000 = ₹ 6,500

∴ Net gain = ₹6,500

**(iii)** In this situation, the put is worthless, since the price of the stock exceeds the put's exercise price. Only call option is valuable and is exercised.

Total premium paid = ₹ 3,500

Ending value = -3,500 +[(600 – 550) × 100]

Net Gain = -3,500 + 5,000 = ₹ 1,500

**6.** Future's Price = Spot + cost of carry – Dividend

F = 220 + 220 × 0.15 × 0.25 – 0.25** × 10 = 225.75

** Entire 25% dividend is payable before expiry, which is ₹ 2.50.

Thus we see that futures price by calculation is ₹ 225.75 which is quoted at ₹ 230 in the exchange.

**Analysis:**

Fair value of Futures less than Actual futures Price:

Futures Overvalued Hence it is advised to sell. Also do Arbitraging by buying stock in the cash market.

**Step I**

He will buy PQR Stock at ₹ 220 by borrowing at 15% for 3 months. Therefore, his outflows are:

| | |
|---|---|
| Cost of Stock | 220.00 |
| *Add*: Interest @ 15 % for 3 months i.e. 0.25 years (220 × 0.15 × 0.25) | 8.25 |
| Total Outflows (A) | 228.25 |

**Step II**

He will sell March 2000 futures at ₹ 230. Meanwhile he would receive dividend for his stock.

| | |
|---|---|
| Hence his inflows are | 230.00 |
| Sale proceeds of March 2000 futures | 2.50 |
| Total inflows (B) | 232.50 |

Inflow – Outflow = Profit earned by Arbitrageur

= 232.50 – 228.25 = 4.25

**7.** Value of share at present = $\frac{D_1}{k_e - g}$

$= \frac{2(1.06)}{0.08 - 0.06} =$ ₹ 106

However, if the Board implement its decision, no dividend would be payable for 3 years and the dividend for year 4 would be ₹ 2.50 and growing at 7% p.a. The price of the share, in this case, now would be:

$P_0 = \frac{2.50}{0.08 - 0.07} \times \frac{1}{(1 + 0.08)^3} =$ ₹ 198.46

So, the price of the share is expected to increase from ₹ 106 to ₹ 198.45 after the announcement of the project. The investor can take up this situation as follows:

| | | |
|---|---|---|
| Expected market price after 3 years | $= \frac{2.50}{0.08 - 0.07}$ | ₹ 250.00 |
| Expected market price after 2 years | $\frac{2.50}{0.08 - 0.07} \times \frac{1}{(1 + 0.08)}$ | ₹ 231.48 |
| Expected market price after 1 years | $\frac{2.50}{0.08 - 0.07} \times \frac{1}{(1 + 0.08)^2}$ | ₹ 214.33 |

In order to maintain his receipt at ₹ 2,000 for first 3 year, he would sell

| | |
|---|---|
| 10 shares in first year @ ₹ 214.33 for | ₹ 2,143.30 |
| 9 shares in second year @ ₹ 231.48 for | ₹ 2,083.32 |
| 8 shares in third year @ ₹ 250 for | ₹ 2,000.00 |

At the end of 3rd year, he would be having 973 shares valued @ ₹ 250 each i.e. ₹ 2,43,250. On these 973 shares, his dividend income for year 4 would be @ ₹ 2.50 i.e. ₹ 2,432.50.

So, if the project is taken up by the company, the investor would be able to maintain his receipt of at least ₹ 2,000 for first three years and would be getting increased income thereafter.

**8. (i) Calculation of Market price:**

$$TM = \frac{\text{Coupon interest} + \left(\frac{\text{Discount or premium}}{\text{Years left}}\right)}{\frac{\text{Face Value} + \text{Market value}}{2}}$$

Discount or premium – YTM is more than coupon rate, market price is less than Face Value i.e. at discount.

Let *x* be the market price

$$0.15 = \frac{110 + \left\{\frac{(1{,}000 - x)}{6}\right\}}{\frac{1{,}000 + x}{2}}$$

x = ₹ 834.48

**(ii) Duration**

| *Year* | *Cash flow* | *P.V. @ 15%* | | *Proportion of bond value* | *Proportion of bond value x time (years)* |
|---|---|---|---|---|---|
| 1 | 110 | .870 | 95.70 | 0.113 | 0.113 |
| 2 | 110 | .756 | 83.16 | 0.098 | 0.196 |
| 3 | 110 | .658 | 72.38 | 0.085 | 0.255 |
| 4 | 110 | .572 | 62.92 | 0.074 | 0.296 |
| 5 | 110 | .497 | 54.67 | 0.064 | 0.320 |
| 6 | 1110 | .432 | 479.52 | 0.565 | 3.39 |
| | | | 848.35 | 1.000 | 4.570 |

Duration of the Bond is 4.570 years

**(iii) Volatility**

$$\text{Volatility of the bond} = \frac{\text{Duration}}{(1 + \text{yields})} = \frac{4.570}{1.15} = 3.974$$

**(iv)** The expected market price if increase in required yield is by 100 basis points.

= ₹ 834.48× 1.00 (3.974/100) = ₹ 33.162

Hence expected market price is ₹ 834.48 – ₹ 33.162 = ₹ 801.318

Hence, the market price will decrease

**(v)** The expected market price if decrease in required yield is by 75 basis points.

= ₹ 834.48× 0.75 (3.974/100) = ₹ 24.87

Hence expected market price is ₹ 834.48 + ₹ 24.87 = ₹ 859.35

Hence, the market price will increase.

**9.** First we shall compute the β of Security X.

$$\text{Risk Free Rate} = \frac{\text{Coupon Payment}}{\text{Current Market Price}} = \frac{7}{140} = 5\%$$

Assuming equilibrium return to be equal to CAPM return then:

$15\% = R_f + \beta_X(R_m - R_f)$

$15\% = 5\% + \beta_X(15\% - 5\%)$

$\beta_X = 1$

or it can also be computed as follows:

$$\frac{R_m}{R_s} = \frac{15\%}{15\%} = 1$$

(i) Standard Deviation of Market Return

$$\beta_m = \frac{Cov_{X,m}}{\sigma_m^2} = \frac{225\%}{\sigma_m^2} = 1$$

$\sigma^2_m = 225$

$\sigma_m = \sqrt{225} = 15\%$

(ii) Standard Deviation of Security Return

$$\beta_X = \frac{\sigma_X}{\sigma_m} \times \rho_{Xm} = \frac{\sigma_X}{15} \times 0.75 = 1$$

$$\sigma_X = \frac{15}{0.75} = 20\%$$

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

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

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

Expected Return on 'B'

(0.40×20) + (0.30×15) +0.30× (-8) =10.1%

Expected Return on Market index

(0.40 × 18) + (0.30 × 13) + 0.30 × (-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

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

(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=106.20

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) i.e. 11.5 % – 9.924% = 1.576%

Alpha for Stock B

E (B) – R (B) 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.

**11.**

| ***Particulars*** | ***₹*** |
|---|---|
| Average level of Receivables = 3,20,00,000 × 90/360 | 80,00,000 |
| Factoring commission = 80,00,000 × 2/100 | 1,60,000 |
| Factoring reserve = 80,00,000 × 10/100 | 8,00,000 |
| Amount available for advance = ₹ 80,00,000 – (1,60,000 + 8,00,000) | 70,40,000 |
| Factor will deduct his interest @ 18%:- $= \frac{₹\ 70,40,000 \times 18 \times 90}{100 \times 360}$ | ₹ 3,16,800 |
| Advance to be paid = (₹ 70,40,000 – ₹ 3,16,800) | 67,23,200 |

| ***Annual Cost of Factoring to the Firm:*** | ***₹*** |
|---|---|
| Factoring commission (₹ 1,60,000 × 360/90) | 6,40,000 |
| Interest charges (₹ 3,16,800 × 360/90) | 12,67,200 |
| Total | 19,07,200 |
| **Firm's Savings on taking Factoring Service:** | ₹ |
| Cost of credit administration saved | 5,00,000 |
| Cost of Bad Debts (₹ 3,20,00,000 × 1.5/100) avoided | 4,80,000 |
| Total | 9,80,000 |
| Net cost to the Firm (₹ 19,07,200 – ₹ 9,80,000) | 9,27,200 |
| Effective rate of interest to the firm = $\frac{₹\ 9,27,200 \times 100}{67,23,200}$ | 13.79% |

**12.**

| | Amount in ₹ lakhs | Amount in ₹ lakhs | Amount in ₹ lakhs |
|---|---|---|---|
| Opening Bank (200 - 185 -12) | 3.00 | | |
| *Add*: Proceeds from sale of securities | 63.00 | | |
| *Add*: Dividend received | 2.00 | 68.00 | |
| Deduct: | | | |
| Cost of securities purchased | 56.00 | | |
| Fund management expenses paid (90% of 8) | 7.20 | | |

| | | | |
|---|---|---|---|
| Capital gains distributed = 80% of (63 – 60) | 2.40 | | |
| Dividend distributed =80% of 2.00 | 1.60 | 67.20 | |
| Closing Bank | | | 0.80 |
| Closing market value of portfolio | | | 198.00 |
| | | | 198.80 |
| *Less*: Arrears of expenses | | | 0.80 |
| Closing Net Assets | | | 198.00 |
| Number of units (Lakhs) | | | 20 |
| Closing NAV per unit (198.00/20) | | | 9.90 |

Rate of Earning (Per Unit)

| | Amount |
|---|---|
| Income received (₹ 2.40 + ₹ 1.60)/20 | ₹ 0.20 |
| Loss: Loss on disposal (₹ 200 - ₹ 198)/20 | ₹ 0.10 |
| Net earning | ₹ 0.10 |
| Initial investment | ₹ 10.00 |
| Rate of earning (monthly) | 1% |
| Rate of earning (Annual) | 12% |

**13.** In order to find out the NAV, the cash balance at the end of the year is calculated as follows-

| **Particulars** | **₹** |
|---|---|
| Cash balance in the beginning | |
| (₹ 100 lakhs – ₹ 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** | ₹ |
| Cash Balance | 10,51,000 |
| 7% Govt. Securities (at par) | 8,00,000 |

| | |
|---|---|
| 50,000 equity shares @ ₹ 175 each | 87,50,000 |
| 9% Debentures (Unlisted) at cost | 5,00,000 |
| 10% Debentures @90% | 4,50,000 |
| Total Assets | 1,15,51000 |
| No. of Units | 10,00,000 |
| NAV per Unit | ₹ 11.55 |

Calculation of NAV, if dividend of ₹ 0.80 is paid –

| | |
|---|---|
| Net Assets (₹ 1,15,51,000 – ₹ 8,00,000) | ₹ 1,07,51,000 |
| No. of Units | 10,00,000 |
| NAV per unit | ₹ 10.75 |

**14.** Nominal Interest or Bond Equivalent Yield = $\left[\frac{F-P}{P}\right]\times\frac{12}{M}\times 100$

Where

F= Face Vale

P= Issue Price

$= \frac{1,00,000-97,550}{97,550}\times\frac{12}{3}\times 100 = 0.025115 \times 4 \times 100 = 10.046 = 10.05\%$ p.a.

Effective interest rate = $[1+\frac{0.1005}{4}]^4 - 1 = 10.435\%$ p.a.

**Cost of Funds to the Company**

| | |
|---|---|
| Effective Interest | 10.435 |
| Brokerage (0.150 × 4) | 0.60% |
| Rating Charge | 0.50% |
| Stamp duty (0.175 × 4) | 0.70% |
| | 12.235 |

**15. Calculation of NPV**

| Year | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| Inflation factor in India | 1.00 | 1.10 | 1.21 | 1.331 |
| Inflation factor in Africa | 1.00 | 1.40 | 1.96 | 2.744 |
| Exchange Rate (as per IRP) | 6.00 | 7.6364 | 9.7190 | 12.3696 |
| Cash Flows in ₹ '000 | | | | |

| | | | | |
|---|---|---|---|---|
| Real | -50000 | -1500 | -2000 | -2500 |
| Nominal (1) | -50000 | -1650 | -2420 | -3327.50 |
| Cash Flows in African Rand '000 | | | | |
| Real | -200000 | 50000 | 70000 | 90000 |
| Nominal | -200000 | 70000 | 137200 | 246960 |
| In Indian ₹ '000 (2) | -33333 | 9167 | 14117 | 19965 |
| Net Cash Flow in ₹ '000 (1)+(2) | -83333 | 7517 | 11697 | 16637 |
| PVF@20% | 1 | 0.833 | 0.694 | 0.579 |
| PV | -83333 | 6262 | 8118 | 9633 |

NPV of 3 years = -59320 (₹ '000)

NPV of Terminal Value = $\frac{16637}{0.20} \times 0.579 = 48164$ (₹ '000)

Total NPV of the Project = -59320 (₹ '000) + 48164 (₹ '000) = -11156 (₹ '000)

**16. (A)** To cover payable and receivable in forward Market

| | |
|---|---|
| Amount payable after 3 months | $7,00,000 |
| Forward Rate | ₹ 48.45 |
| Thus Payable Amount (₹) (A) | ₹ 3,39,15,000 |
| Amount receivable after 2 months | $ 4,50,000 |
| Forward Rate | ₹ 48.90 |
| Thus Receivable Amount (₹) (B) | ₹ 2,20,05,000 |
| Interest @ 12% p.a. for 1 month (C) | ₹2,20,050 |
| Net Amount Payable in (₹) (A) – (B) – (C) | ₹ 1,16,89,950 |

**(B)** Assuming that since the forward contract for receivable was already booked it shall be cancelled if we lag the receivables. Accordingly any profit/ loss on cancellation of contract shall also be calculated and shall be adjusted as follows:

| | |
|---|---|
| Amount Payable ($) | $7,00,000 |
| Amount receivable after 3 months | $ 4,50,000 |
| Net Amount payable | $2,50,000 |
| Applicable Rate | ₹ 48.45 |
| Amount payable in (₹) (A) | ₹ 1,21,12,500 |
| Profit on cancellation of Forward cost (48.90 – 48.30) × 4,50,000 (B) | ₹ 2,70,000 |
| Thus net amount payable in (₹) (A) + (B) | ₹ 1,18,42,500 |

Since net payable amount is least in case of first option, hence the company should cover payable and receivables in forward market.

**Note**: In the question it has not been clearly mentioned that whether quotes given for 2 and 3 months (in point's terms) are premium points or direct quotes. Although above solution is based on the assumption that these are direct quotes, but students can also consider them as premium points and solve the question accordingly.

**17. (i) If investment is made at London**

| | |
|---|---|
| Convert US$ 5,00,000 at Spot Rate (5,00,000/1.5390) | = £ 3,24,886 |
| *Add:* £ Interest for 3 months on £ 324,886 @ 5% | = £ 4,061 |
| | = £ 3,28,947 |
| *Less:* Amount Invested $ 5,00,000 | |
| Interest accrued thereon | $ 5,000 |
| | = $ 5,05,000 |
| Equivalent amount of £ required to pay the above sum ($ 5,05,000/1.5430) | = £ 3,27,285 |
| Arbitrage Profit | = £ 1,662 |

**(ii) If investment is made at New York**

| | |
|---|---|
| Gain $ 5,00,000 (8% - 4%) x 3/12 | = $ 5,000 |
| Equivalent amount in £ 3 months ($ 5,000/ 1.5475) | £ 3,231 |

**(iii) If investment is made at Frankfurt**

| | |
|---|---|
| Convert US$ 500,000 at Spot Rate (Cross Rate) 1.8260/1.5390 | = € 1.1865 |
| Euro equivalent US$ 500,000 | = € 5,93,250 |
| *Add:* Interest for 3 months @ 3% | = € 4,449 |
| | = € 5,97,699 |
| 3 month Forward Rate of selling € (1/1.8150) | = £ 0.5510 |
| Sell € in Forward Market € 5,97,699 x £ 0.5510 | = £ 3,29,332 |
| *Less:* Amounted invested and interest thereon | = £ 3,27,285 |
| Arbitrage Profit | = £ 2,047 |

Since out of three options the maximum profit is in case investment is made in New York. Hence it should be opted.

**18.**

| Business Segment | Capital-to-Sales | Segment Sales | Theoretical Values |
|---|---|---|---|
| Wholesale | 0.85 | €225000 | €191250 |
| Retail | 1.2 | €720000 | €864000 |
| General | 0.8 | €2500000 | €2000000 |
| Total value | | | €3055250 |

| Business Segment | Capital-to-Assets | Segment Assets | Theoretical Values |
|---|---|---|---|
| Wholesale | 0.7 | €600000 | €420000 |
| Retail | 0.7 | €500000 | €350000 |
| General | 0.7 | €4000000 | €2800000 |
| Total value | | | €3570000 |

| Business Segment | Capital-to-Operating Income | Operating Income | Theoretical Values |
|---|---|---|---|
| Wholesale | 9 | €75000 | €675000 |
| Retail | 8 | €150000 | €1200000 |
| General | 4 | €700000 | €2800000 |
| Total value | | | €4675000 |

$$\text{Average theoretical value} = \frac{3055250 + 3570000 + 4675000}{3} = 3766750$$

Average theoretical value of Cranberry Ltd. = €3766750

**19.**

| **Particulars** | **Mark Ltd.** | **Mask Ltd.** |
|---|---|---|
| EPS | ₹ 2,000 Lakhs/ 200 lakhs = ₹ 10 | ₹ 400 lakhs / 100 lakhs ₹ 4 |
| Market Price | ₹ 10 × 10 = ₹ 100 | ₹ 4 × 5 = ₹ 20 |

**(i)** The Swap ratio based on current market price is

₹ 20 / ₹ 100 = 0.2 or 1 share of Mark Ltd. for 5 shares of Mask Ltd.

No. of shares to be issued = 100 lakh × 0.2 = 20 lakhs.

**(ii)** EPS after merger

$$= \frac{₹\ 2{,}000\ \text{lakhs} + ₹\ 400\ \text{lakhs}}{200\ \text{lakhs} + 20\ \text{lakhs}} = ₹\ 10.91$$

**(iii)** Expected market price after merger assuming P / E 10 times.

= ₹ 10.91 × 10 = ₹ 109.10

**(iv)** Market value of merged firm

= ₹ 109.10 market price × 220 lakhs shares = 240.02 crores

**(v)** Gain from the merger

| | |
|---|---|
| Post merger market value of the merged firm | ₹ 240.02 crores |
| *Less:* Pre-merger market value | |
| Mark Ltd. 200 Lakhs × ₹ 100 = 200 crores | |
| Mask Ltd. 100 Lakhs × ₹ 20 = 20 crores | ₹ 220.00 crores |
| Gain from merger | ₹ 20.02 crores |

Appropriation of gains from the merger among shareholders:

| | *Mark Ltd.* | *Mask Ltd.* |
|---|---|---|
| Post merger value | 218.20 crores | 21.82 crores |
| *Less:* Pre-merger market value | 200.00 crores | 20.00 crores |
| Gain to Shareholders | 18.20 crores | 1.82 crores |

**20. (a) Interface of Financial Policy and Strategic Management:** Financial policy of a company cannot be worked out in isolation of other functional policies. It has a wider appeal and closer link with the overall organizational performance and direction of growth.

- Sources of finance and capital structure are the most important dimensions of a strategic plan. The need for fund mobilization to support the expansion activity of firm is utmost important for any business.
- Policy makers should decide on the capital structure to indicate the desired mix of equity capital and debt capital.
- Another important dimension of strategic management and financial policy interface is the investment and fund allocation decisions.
- Dividend policy is yet another area for making financial policy decisions affecting the strategic performance of the company. A close interface is needed to frame the policy to be beneficial for all.

**(b) Social Cost Benefit Analysis in relation to evaluation of an industrial project:** This refers to the moral responsibility of both PSU and private sector enterprises to undertake socially desirable projects – that is, the social contribution aspect needs to be kept in view.

Industrial capital investment projects are normally subjected to rigorous feasibility analysis and cost benefit study from the point of view of the investors. Such projects, especially large ones often have a ripple effect on other sections of society, local environment, use of scarce national resources etc. Conventional cost-benefit analysis ignores or does not take into account or ignores the societal effect of such projects. Social Cost Benefit (SCB) is recommended and resorted to in such cases to bring under the scanner the social costs and benefits.

SCB sometimes changes the very outlook of a project as it brings elements of study which are unconventional yet very relevant. In a study of a famous transportation project in the UK from a normal commercial angle, the project was to run an annual deficit of more than 2 million pounds. The evaluation was adjusted for a realistic fare structure which the users placed on the services provided which changed the picture completely and the project got justified. Large public sector/service projects especially in under-developed countries which would get rejected on simple commercial considerations will find justification if the social costs and benefits are considered.

SCB is also important for private corporations who have a moral responsibility to undertake socially desirable projects, use scarce natural resources in the best interests of society, generate employment and revenues to the national exchequer.

Indicators of the social contribution include

(i) Employment potential criterion;

(ii) Capital output ratio – that is the output per unit of capital;

(iii) Value added per unit of capital;

(iv) Foreign exchange benefit ratio.

**(c) Green Shoe Option:** It is an option that allows the underwriting of an IPO to sell additional shares if the demand is high. It can be understood as an option that allows the underwriter for a new issue to buy and resell additional shares upto a certain pre-determined quantity.

Looking to the exceptional interest of investors in terms of over-subscription of the issue, certain provisions are made to issue additional shares or bonds to underwriters for distribution. The issuer authorises for additional shares or bonds. In common parlance, it is the retention of over-subscription to a certain extent. It is a special feature of euro-issues. In euro-issues the international practices are followed.

In the Indian context, green shoe option has a limited connotation. SEBI guidelines governing public issues contain appropriate provisions for accepting over-subscriptions, subject to a ceiling, say, 15 per cent of the offer made to public. In certain situations, the green-shoe option can even be more than 15 per cent.

**Examples:**

- IDBI had come–up earlier with their Flexi bonds (Series 4 and 5). This is a debt-instrument. Each of the series was initially floated for ₹ 750 crores. SEBI had permitted IDBI to retain an excess of an equal amount of ₹ 750 crores.
- ICICI had launched their first tranche of safety bonds through unsecured redeemable debentures of ₹ 200 crores, with a green shoe option for an identical amount.

  More recently, Infosys Technologies has exercised the green shoe option to purchase upto 7,82,000 additional ADSs representing 3,91,000 equity shares. This offer initially involved 5.22 million depository shares, representing 2.61 million domestic equity shares.

**(d) Debt/Asset Securitization:** Debt Securitisation is a method of recycling of funds. This method is mostly used by finance companies to raise funds against financial assets such as loan receivables, mortgage backed receivables, credit card balances, hire purchase debtors, lease receivables, trade debtors, etc. and thus beneficial to such financial intermediaries to support their lending volumes. Thus, assets generating steady cash flows are packaged together and against this assets pool market securities can be issued. Investors are usually cash-rich institutional investors like mutual funds and insurance companies.

The process can be classified in the following three functions:

1. **The origination function –** A borrower seeks a loan from finance company, bank, housing company or a financial institution. On the basis of credit worthiness repayment schedule is structured over the life of the loan.
2. **The pooling function –** Many similar loans or receivables are clubbed together to create an underlying pool of assets. This pool is transferred in favour of a SPV (Special Purpose Vehicle), which acts as a trustee for the investor. Once the assets are transferred they are held in the organizers portfolios.
3. **The securitisation function –** It is the SPV's job to structure and issue the securities on the basis of asset pool. The securities carry coupon and an expected maturity, which can be asset base or mortgage based. These are generally sold to investors through merchant bankers. The investors interested in this type of securities are generally institutional investors like mutual fund, insurance companies etc. The originator usually keeps the spread available (i.e. difference) between yield from secured asset and interest paid to investors.

Generally, the process of securitisation is without recourse i.e. the investor bears the credit risk of default and the issuer is under an obligation to pay to investors only if the cash flows are received by issuer from the collateral.

**(e) Forfaiting versus Export Factoring**

(i) A forfaiter discounts the entire value of the note/bill. In a factoring arrangement the extent of financing available is 75-80%.

(ii) The forfaiter's decision to provide financing depends upon the financing standing of the availing bank. On the other hand in a factoring deal the export factor bases his credit decision on the credit standards of the exporter.

(iii) Forfaiting is a pure financial agreement while factoring includes ledger administration as well as collection.

(iv) Factoring is a short-term financial deal. Forfaiting spreads over 3-5 years.