

## Gurukripa's Guideline Answers for May 2015 Exam Questions CA Final –Strategic Financial Management

Question No.1 is Compulsory. Answer any 5 Questions from the remaining 6 Questions. Answer any 4 out of 5 in Q.7.  
**Note:** Page Number References are from "Padhuka's Students' Referencer on Strategic Financial Management"

**Question 1(a): Forward vs Future vs No Hedge****6 Marks**

EFD Ltd is an Export Business House. The Company prepares Invoice in customers' currency. Its Debtors of US\$ 10,000,000 is due on 1<sup>st</sup> April 2015.

Market Information as at 1<sup>st</sup> January 2015 is:

| Exchange Rates US\$ / INR |          | Currency Futures US\$ / INR |          |
|---------------------------|----------|-----------------------------|----------|
| Spot                      | 0.016667 | Contract Size: ₹ 24,816,975 |          |
| 1-month forward           | 0.016529 | 1-month                     | 0.016519 |
| 3-months forward          | 0.016129 | 3-months                    | 0.016118 |

|          | Initial Margin | Interest rates in India |
|----------|----------------|-------------------------|
| 1-month  | ₹ 17,500       | 6.5%                    |
| 3-months | ₹ 22,500       | 7%                      |

On 1<sup>st</sup> April 2015, the Spot Rate US\$ / INR is 0.016136 and Currency Future Rate is 0.016134.

Which of the following methods would be most advantageous to EFD Ltd?

- (i) Using Forward Contract
- (ii) Using Currency Futures
- (iii) Not hedging the Currency Risk

**Solution:**

Similar to Page No.17.80, Q.No.76 – [N 06]

### 1. Forward Contract Hedge

| Particulars  | Amount               |
|--|----------------------|
| Amount receivable in US Dollars                              | USD 1,00,00,000      |
| 3 months Forward Rate USD per ₹                              | 0.016129             |
| <b>Cash Inflow</b> in ₹ (USD 1,00,00,000 ÷ USD 0.016129 / ₹) | <b>₹62,00,01,240</b> |

### 2. Hedging using Currency Futures

**Facts:** USD 1,00,00,000 is receivable in 3-Months time. USD should be encashed into Rupees. Therefore, USD should be sold and Rupee should be bought. Therefore, the Company should **BUY Rupee Futures Contract**.

**Cash Flows:**

|                      |   |
|----------------------|---|
| Jan 1 (Now)          | Payment of Initial Margin in by borrowing in Rupees   |
| Apr 1 (3 Mths Later) | Settlement of Variable Margin based on Contracted Futures Rate and Futures Rate on Settlement Date for April 2015 Futures     |
| Apr 1 (3 Mths Later) | Purchase of Rupee by paying in US Dollars (received from the Overseas Customer) based on Spot Rate on the date of settlement. |
| Apr 1 (3 Mths Later) | Settlement of money borrowed in Rupees for payment of Margin along with interest  |

### (a) No. of Futures Contracts Required and Margin Money

| Particulars   | Amount                        |
|---|-------------------------------|
| Amount receivable in USD                                      | (A) USD 1,00,00,000           |
| Exchange Rate for April 2015 Futures [USD / ₹]                | (B) USD 0.016118              |
| Total Value Receivable in Rupees = <b>Rupees to be bought</b> | (C) = (A) ÷ (B) ₹62,04,24,370 |
| Contract Size   | ₹2,48,16,976                  |

| Particulars  | Amount    |
|--|-----------|
| <b>No. of Contracts Required</b> [Rupee required ₹62,04,24,370 ÷ Contract Size ₹2,48,16,975]         | 25        |
| Margin Money per April 2015 Rupee Futures Contract   | ₹22,500   |
| <b>Therefore, Total Margin Money payable</b> [₹22,500 per Contract × 25 Contracts] = Amount Borrowed | ₹5,62,500 |

**(b) Settlement of Variable Margin Money**

| Particulars  | Amount             |
|--|--------------------|
| 1. Total Value of Rupee Futures Bought [25 Contracts × ₹ 2,48,16,975]  | ₹62,04,24,400      |
| 2. Contracted Futures Rate [USD payable per Rupee]   | USD 0.016118       |
| 3. Total USD Payable for buying ₹ under Futures Contract based on contracted Apr 2015 Futures Rate<br>[1 × 2]                            | USD 1,00,00,000    |
| 4. Futures Rate on date of settlement or expiry [USD payable per Rupee]  | USD 0.016134       |
| 5. Total USD Payable for buying ₹ under Futures Contract based on Apr 2015 Futures Rate on the date of settlement                        | USD 1,00,09,927.27 |
| 6. <b>Amount of Gain</b> [Amount Payable under Futures Rate on Expiry Date Less Amount Payable under Contracted Futures Rate]<br>[5 – 3] | 9,927.27           |
| 7. Exchange Rate for Settlement of Amount of Gain [Spot Rate prevailing on the date of settlement]                                       | 0.016136           |
| 8. <b>Amount Receivable in Rupees</b> [Amount of Gain ÷ Exch. Rate] [6 ÷ 7]  | ₹ 6,15,225         |

**(c) Settlement of Futures Contract – Computation of USD Payable**

| Particulars  | Amount             |
|--|--------------------|
| 1. <b>Rupees to be bought = Amount receivable in Rupees</b>                            | ₹ 62,04,24,400     |
| 2. Exchange Rate [Spot Rate prevailing on date of settlement]                          | USD 0.016136       |
| 3. USD Required for buying Rupees [1 × 2]  | USD 1,00,11,168.12 |
| 4. <b>Less:</b> USD Received from Overseas Customer                                    | USD 1,00,00,000    |
| 5. <b>USD to be bought in Spot Market for settling Futures Contract</b> [3 – 4]        | USD 11,168.12      |
| 6. <b>Rate at which USD can be bought</b> [Spot Rate prevailing on date of settlement] | USD 0.016136       |
| 7. <b>Rupees Payable for buying USD</b> [5 ÷ 6]  | ₹ 6,92,124         |

**(d) Total Amount Receivable in Rupees [Cash Flows on Settlement Date]**

| Particulars   | ₹                   |
|---|---------------------|
| Amount Receivable on Settlement of Futures Contract   | 62,04,24,400        |
| <b>Add:</b> Amount Receivable on Settlement of Gain on account of Variable Margin                                     | 6,15,225            |
| <b>Less:</b> Amount payable to buy US Dollars for settlement of Futures Contract                                      | (6,92,124)          |
| <b>Less:</b> Interest Payable on money borrowed for payment of Initial Margin [₹5,62,500 × 7% p.a. × $\frac{3}{12}$ ] | (9,844)             |
| <b>Net Inflow under Futures Contract</b>  | <b>62,03,37,657</b> |

**Note:** Initial Margin of ₹5,62,500 and the corresponding borrowing is not considered above, since the sum borrowed and paid on 1<sup>st</sup> January will be received back on 1<sup>st</sup> April and used for settlement of the borrowing.

**3. No Hedge Situation**

| Particulars   | Amount               |
|---|----------------------|
| Amount receivable in US Dollars                                 | USD 1,00,00,000      |
| Exchange Rate on the date of settlement [Spot Rate] [USD per ₹] | 0.016136             |
| <b>Cash Inflow</b> in ₹ (USD 1,00,00,000 ÷ USD 0.016136/ ₹)     | <b>₹61,97,32,276</b> |

**4. Evaluation of Alternatives**

| Alternative                 | Cash Inflow   | Ranking |
|-----------------------------|---------------|---------|
| Forward Market Hedge (WN 1) | ₹62,00,01,240 | 2       |
| Futures Contract (WN 2 d)   | ₹62,03,37,657 | 1       |
| No Hedging (WN 3)           | ₹61,97,32,276 | 3       |

**Conclusion:** Expected Cash Inflows under Futures Contract Hedge is maximum and hence would be most advantageous.

**Question 1(b): Mutual Funds – Effective Yield****4 Marks**

TUV Ltd has invested in three Mutual Fund Schemes as per the details given below:

|   | Scheme X   | Scheme Y   | Scheme Z   |
|---|------------|------------|------------|
| Date of Investment                                  | 01-10-2014 | 01-01-2015 | 01-03-2015 |
| Amount of Investment (₹)                            | 15,00,000  | 7,50,000   | 2,50,000   |
| Net Asset Value at Entry Date                       | ₹ 12.50    | ₹ 36.25    | ₹ 27.75    |
| Dividend received up to 31 <sup>st</sup> March 2015 | ₹ 45,000   | ₹ 12,500   | Nil        |
| Net Asset Value as at 31 <sup>st</sup> March 2015   | ₹ 12.25    | ₹ 36.45    | ₹ 27.55    |

What will be the Effective Yield (per annum basis) for each of the above three schemes upto 31<sup>st</sup> March 2015?**Solution:****Similar to Page No.8.18, Q.No.11 – [RTP, N 04, N 09, M 13]****1. Computation of Net Value Added during the year ended 31.03.2015**

| Schemes  | Opening NAV (₹) | NAV as at Entry Date | Number of Units | NAV as at 31.03.2015 (₹) | Capital Appreciation (₹) |
|----------|-----------------|----------------------|-----------------|--------------------------|--------------------------|
| [1]      | [2]             | [3]                  | [4]=[2]÷[3]     | [5]                      | [7]=[5]–[3] × (4)        |
| Scheme X | 15,00,000       | ₹12.50               | 1,20,000        | 12.25                    | (-)30,000                |
| Scheme Y | 7,50,000        | ₹36.25               | 20,689.66       | 36.45                    | (+)4,137.93              |
| Scheme Z | 2,50,000        | ₹27.75               | 9,009.01        | 27.55                    | (-)1,801.80              |

**2. Effective Yield in %**

- Total Yield = Capital Appreciation + Dividend
- Effective Yield in % = (Total Yield ÷ Opening NAV) × (365 ÷ No. of days of holding)

| Schemes  | Dividend Received (₹) | Capital Appreciation (₹) | Total Yield(₹) | No. of days | Effective yield % p.a |
|----------|-----------------------|--------------------------|----------------|-------------|-----------------------|
| Scheme X | 45,000                | (-)30,000                | 15,000         | 182         | 2.01%                 |
| Scheme Y | 12,500                | (+)4,137.93              | 16,637.93      | 90          | 9%                    |
| Scheme Z | —                     | (-)1,801.80              | (-)1,801.80    | 31          | (8.49)%               |

**Question 1(c): Factoring–Effective Rate of Cost****6 Marks**

PQR Ltd has credit sales of ₹ 165 Crores during the Financial Year 2014–2015 and its Average Collection Period is 65 days. The past experience suggest that Bad Debt Losses are 4.28% of Credit Sales.

Administration Cost incurred in collection of its Receivables is ₹ 12,35,000 p.a. A Factor is prepared to buy the Company's Receivables by charging 1.95% Commission. The Factor will pay advance on Receivables to the Company at an interest rate of 16% p.a. after withholding 15% as Reserve.

Estimate the Effective Cost of Factoring to the Company assuming 360 days in a year.

**Solution:****Similar to Page No.4.12, Q.No.9 – [RTP, N 08]**

| Particulars  |   | ₹Crores        |
|--------------|---|----------------|
| Receivables  | [Total Sales ₹165Crores × Collection Period 65 / 360]                     | 29.7917        |
| <b>Less:</b> | 15% Factor Margin Money [₹29.7917 × 15%]                                  | (4.4688)       |
|              | Amount of Finance offered by Factor                                       | 25.3229        |
| <b>Less:</b> | Factor Commission [1.95% of Factored Debts of ₹29.7917]                   | (0.5809)       |
|              | <b>Amount Available for Advance</b>                                       | <b>24.7420</b> |
| <b>Less:</b> | Interest at 16% for 65 Days [₹25.3229 × 16% × 65 Days / 360 Days]         | (0.7316)       |
|              | <b>Net Amount Paid to the Firm</b> (Assumed Net of Commission & Interest) | <b>24.0104</b> |
|              | <b>Gross Cost of Factoring</b> = Commission + Interest = 0.5809 + 0.7316  | <b>1.3125</b>  |
| <b>Less:</b> | Savings on account of Factoring   |                |
|              | Cost of Credit Administration [Annual ₹12,35,000 × 65 ÷ 360]              | (0.0223)       |
|              | Bad Debts (assumed as avoided due to Factoring) [₹29.7917 × 4.28%]        | (1.2751)       |
|              | <b>Net Cost of Factoring for 65 days Period</b>                           | <b>0.0151</b>  |

| Particulars   |   | ₹Crores     |
|---|---|-------------|
| Net Cost of Factoring p.a. $0.0151 \times \frac{360}{65}$ |   | 0.0836      |
| (c)   | Effective Rate of Factoring Cost (based on Net Cost) = $\frac{0.0836}{24.7420}$                   | 0.338% p.a. |
| (d)   | Effective Rate of Factoring Cost (based on Gross Cost) = $\frac{1.3125 \times 360 / 65}{24.7420}$ | 29.38% p.a. |

**Question 1(d): Valuation of Shares –Gordon's Model****4 Marks**

The following information is collected from the Annual Reports of J Ltd.

|                   |               |                              |            |
|-------------------|---------------|------------------------------|------------|
| Profit before Tax | ₹ 2.50 Crores | Number of Outstanding Shares | 50,00,000  |
| Tax Rate          | 40 percent    | Equity Capitalization Rate   | 12 percent |
| Retention Ratio   | 40 percent    | Rate of Return on Investment | 15 percent |

What should be the Market Price per Share according to Gordon's Model of Dividend Policy?

**Solution:****Similar to Page No.10.15 Q.No.5**

- EPS (Year 0) =  $\frac{\text{Profit After Tax}}{\text{No. of Outstanding Shares}} = \frac{\text{₹ 2.5 Crores Less 40\%}}{50 \text{ Lakhs Shares}} = \text{₹ 3.}$
- Growth Rate (g) = b × r, i.e. Retention Ratio × Return on Investment = 40% × 15% = **6%**.
- EPS (Year 1) = E<sub>1</sub> = ₹ 3 + 6% = **₹ 3.18.**
- Market Price per Share =  $\frac{E_1 \times (1 - b)}{K_e - br} = \frac{\text{₹ } 3.18 \times (1 - 0.4)}{12\% - 6\%} = \frac{\text{₹ } 1.908}{6\%} = \text{₹ } 31.80$  [K<sub>e</sub> = Cost of Equity = 12%]

**Question 2(a):CAPM****8 Marks**

Mr. Shyam is holding the following Securities:

| Particulars of Securities | Cost ₹ | Dividend / Interest ₹ | Market Price ₹ | Beta |
|---------------------------|--------|-----------------------|----------------|------|
| Equity Shares:            |        |                       |                |      |
| Gold Ltd                  | 10,000 | 1,725                 | 9,800          | 0.6  |
| Silver Ltd                | 15,000 | 1,000                 | 16,200         | 0.8  |
| Bronze Ltd                | 14,000 | 700                   | 20,000         | 0.6  |
| GOI Bonds                 | 36,000 | 3,600                 | 34,500         | 1.0  |

Average Return of the Portfolio is 15.7%.

Using Average Beta, calculate:

- Expected Rate of Return in each case, using the Capital Asset Pricing Model (CAPM).
- Risk Free Rate of Return.

**Solution:****Similar to Page 7.35, Q. No. 18 [RTP, M 96, M 03, N 05, M 08]**

| Particulars of Securities | Cost ₹        | Dividend/ Interest ₹ | Capital Gain = Market Price – Cost |
|---------------------------|---------------|----------------------|------------------------------------|
| Gold Ltd                  | 10,000        | 1,725                | 9,800 – 10,000 = – 200             |
| Silver Ltd                | 15,000        | 1,000                | 16,200 – 15,000 = 1,200            |
| Bronze Ltd                | 14,000        | 700                  | 20,000 – 14,000 = 6,000            |
| GOI Bonds                 | 36,000        | 3,600                | 34,500 – 36,000 = –1,500           |
| <b>Total</b>              | <b>75,000</b> | <b>7,025</b>         | <b>5,500</b>                       |

- Actual Return on Market Portfolio** =  $\frac{\text{Dividend Earned + Capital Appreciation}}{\text{Initial Investment}} = \frac{\text{₹ } 7,025 + \text{₹ } 5,500}{75,000} = \text{16.7\%}$

2. **Weighted Average Beta** =  $\left(\frac{10,000}{75,000} \times 0.6\right) + \left(\frac{15,000}{75,000} \times 0.8\right) + \left(\frac{14,000}{75,000} \times 0.6\right) + \left(\frac{36,000}{75,000} \times 1.0\right) = \mathbf{0.832}$

3. **Computation of Risk Free Return (R<sub>f</sub>):**

(a) Beta of GOI Bonds (given as 1.00 in the question) is taken as Yield Beta, attributable to Market Rate and Price Fluctuations, and Income by way of Interest thereon.

(b) Hence, Risk Free Return is taken as the Rate of Interest on GOI Bonds =  $\frac{3,600}{36,000} = \mathbf{10\%}$ .

4. Average Return of Portfolio =  $R_f + \beta (R_m - R_f)$  Now, Beta = 0.832, and R<sub>f</sub> = 10% as above.  
 15.7% (Given) =  $10\% + 0.832 (R_m - 10\%)$  Solving, **R<sub>m</sub> = 16.85%**

5. **Expected Rate of Return for each Security (taking R<sub>f</sub> as 10%)**

| Particulars of Securities | Expected Return = $R_f + \beta (R_m - R_f)$ |
|---------------------------|---|
| Gold Ltd                  | $10 + 0.6 (16.85 - 10) = 14.11\%$           |
| Silver Ltd                | $10 + 0.8 (16.85 - 10) = 15.48\%$           |
| Bronze Ltd                | $10 + 0.6 (16.85 - 10) = 14.11\%$           |
| GOI Bonds                 | $10 + 1.0 (16.85 - 10) = 16.85\%$           |

**Note:** Instead of above Formula, GOI Bonds may be taken at **R<sub>f</sub> 10%**

**Question 2(b): Bond Valuation**

**8 Marks**

On 31<sup>st</sup> March 2013, the following information about Bonds is available:

| Name of Security | Face Value ₹ | Maturity Date               | Coupon Rate | Coupon Date(s)                                    |
|------------------|--------------|-----------------------------|-------------|---|
| Zero Coupon      | 10,000       | 31 <sup>st</sup> March 2023 | N.A.        | N.A.  |
| T-Bill           | 1,00,000     | 20 <sup>th</sup> June 2013  | N.A.        | N.A.  |
| 10.71% GOI 2023  | 100          | 31 <sup>st</sup> March 2023 | 10.71       | 31 <sup>st</sup> March                            |
| 10% GOI 2018     | 100          | 31 <sup>st</sup> March 2018 | 10.00       | 31 <sup>st</sup> March & 31 <sup>st</sup> October |

Calculate:

- If 10 years yield is 7.5% p.a., what price the Zero Coupon Bond would fetch on 31<sup>st</sup> March 2013?
- What will be the annualized yield if the T-Bill is traded @ 98500?
- If 10.71% GOI 2023 Bond having YTM is 8%, what Price would it fetch on 1<sup>st</sup> April 2013 (after Coupon Payment on 31<sup>st</sup> March)?
- If 10% GOI 2018 Bond having YTM is 8%, what Price would it fetch on 1<sup>st</sup> April 2013 (after Coupon Payment on 31<sup>st</sup> March)?

**Solution:**

1. **Zero Coupon Bond:** Cash Inflows at Maturity = ₹ 10,000, Life = 10 years, Yield = 7.5% p.a.

So, Price as on 31.3.2013 = PV of Cash Flows discounted at 7.5% p.a. =  $\frac{10,000}{(1 + 0.075)^{10}} = \frac{10,000}{(1.075)^{10}} = \frac{10,000}{2.0610} = ₹ 4,852.$

2. **Annualized Yield of T Bill:**

(a) Period from 31<sup>st</sup> March 2013 to 20<sup>th</sup> June 2013 = 30 + 31 + 20 = 81 days.

(b) Value of T Bill traded as on 31<sup>st</sup> March 2013 = ₹98,500(given).

(c) So, Annualized Yield =  $\frac{\text{Income from T Bill}}{\text{Price of T Bill}} \times \frac{365}{81} \times 100\% = \frac{\text{Redemption Price} - \text{Issue Price}}{\text{Issue Price}} \times \frac{365}{81} \times 100$   
 $= \frac{1,00,000 - 98,500}{98,500} \times \frac{365}{81} \times 100 = \mathbf{6.8622\%}$

3. **Price of 10.71% GOI 2023:** Face Value of the Bond = 100, Tenure of the Bond = 10 years, Interest Rate = 10.71%.

Fair Value of the Bond = Present Value of Future Cash Flows from the Bond

= (a) Interest Received every year =  $100 \times 10.71\% = 10.71$

(b) Redemption Value (Maturity Value) = ₹ 100 realised in 10<sup>th</sup> Year

| Details                       | Year                  | Cash Flow ₹ | PVF@ YTM Rate8% | DCF (₹)       |
|-------------------------------|-----------------------|-------------|-----------------|---------------|
| Interest                      | 1 to 10 Year          | 10.71       | 6.7101          | 71.87         |
| Maturity Value                | 10 <sup>th</sup> Year | 100         | 0.4632          | 46.32         |
| <b>Fair Value of the Bond</b> |                       |             |                 | <b>118.19</b> |

4. **Price of 10% GOI 2018 Bond:**

Fair Value of the Bond = Present Value of Future Cash Flows from the Bond  
= (a) Interest Received every year =  $100 \times ₹ 10 = ₹ 10$   
(b) Maturity Value = ₹ 100

| Details                       | Year                 | Cash Flow | PVF @ YTM Rate8% | DCF           |
|-------------------------------|----------------------|-----------|------------------|---------------|
| Interest                      | 1 to 5 Year          | 10        | 3.9927           | 39.93         |
| Maturity Value                | 5 <sup>th</sup> Year | 100       | 0.6806           | 68.06         |
| <b>Fair Value of the Bond</b> |                      |           |                  | <b>107.99</b> |

**Question 3(a): Breakup of EPS, Exchange Ratios, etc.****8 Marks**

R Ltd and S Ltd are Companies that operate in the same industry. The Financial Statements of both the Companies for the Current Financial Year are as follows:

**Balance Sheet**

| Equity & Liabilities                          | R Ltd (₹)        | S Ltd (₹)        | Assets                | R Ltd (₹)        | S Ltd (₹)        |
|---|------------------|------------------|-----------------------|------------------|------------------|
| 1. Shareholders' Fund                         |                  |                  | 1. Non-Current Assets | 20,00,000        | 10,00,000        |
| (a) Equity Capital (₹ 10 each)                | 20,00,000        | 16,00,000        | 2. Current Assets     | 28,00,000        | 20,00,000        |
| (b) Retained Earnings                         | 4,00,000         | -                |                       |                  |                  |
| 2. Non-Current Liabilities:16% Long Term Debt | 10,00,000        | 6,00,000         |                       |                  |                  |
| 3. Current Liabilities                        | 14,00,000        | 8,00,000         |                       |                  |                  |
| <b>Total</b>                                  | <b>48,00,000</b> | <b>30,00,000</b> | <b>Total</b>          | <b>48,00,000</b> | <b>30,00,000</b> |

**Income Statement**

| Particulars                        | R Ltd (₹) | S Ltd (₹) |
|------------------------------------|-----------|-----------|
| A. Net Sales                       | 69,00,000 | 34,00,000 |
| B. Cost of Goods Sold              | 55,20,000 | 27,20,000 |
| C. Gross Profit (A-B)              | 13,80,000 | 6,80,000  |
| D. Operating Expenses              | 4,00,000  | 2,00,000  |
| E. Interest                        | 1,60,000  | 96,000    |
| F. Earnings Before Taxes [C-(D+E)] | 8,20,000  | 3,84,000  |
| G. Taxes @ 35%                     | 2,87,000  | 1,34,400  |
| H. Earnings After Tax (EAT)        | 5,33,000  | 2,49,600  |
| I. No. of Equity Shares            | 2,00,000  | 1,60,000  |
| J. Dividend Payment Ratio (D/P)    | 20%       | 30%       |
| K. Market Price per Share          | ₹ 50      | ₹ 20      |

Assume that both Companies are in the process of negotiating a Merger through exchange of Equity Shares.

You are required to:

- Decompose the Share Price of both the Companies into EPS & P/E components. Also segregate their EPS Figures into Return on Equity (ROE) and Book Value / Intrinsic Value per Share components.
- Estimate Future EPS Growth Rates for both the Companies.
- Based on expected operating synergies, R Ltd estimated that the Intrinsic Value of S Ltd Equity Share would be ₹ 25 per Share on its acquisition. You are required to develop a range of justifiable Equity Share Exchange ratios that can be offered by R Ltd to the Shareholders of S Ltd. Based on your analysis on parts (i) and (ii), would you expect the negotiated terms to be closer to the upper or the lower exchange ratio limits and why?

**Solution:**

**Similar to Page No.18.58, Q.No.39 – [N 08]**

- Two-way analysis of EPS, (a) Market based (i.e. MPS × PE Ratio) & (b) Book based (i.e. ROE × Book Value Per Share)

| Particulars  | R Ltd                                  | S Ltd                                  |
|--|--|--|
| (a) Earnings Per Share = $\frac{\text{Equity Earnings i.e. EAT}}{\text{No. of Equity Shares}}$                           | $\frac{₹ 5,33,000}{2,00,000} = ₹2.665$ | $\frac{₹ 2,49,600}{1,60,000} = ₹1.56$  |
| (b) Market Price per Share (Given)   | ₹50.00                                 | ₹20.00                                 |
| (c) So, PE Multiple = $\frac{\text{MPS}}{\text{EPS}}$  | $\frac{50}{2.665} = 18.76$             | $\frac{20}{1.56} = 12.82$              |
| (d) Return on Equity [Based on PE Multiple] = $\frac{1}{\text{PE Ratio}}$  | $\frac{1}{18.76} = 5.33\%$             | $\frac{1}{12.82} = 7.80\%$             |
| Equity Capital   | 20,00,000                              | 16,00,000                              |
| <b>Add:</b> Retained Earnings  | 4,00,000                               | —                                      |
| (e) Book Value of Equity   | 24,00,000                              | 16,00,000                              |
| (f) Book Value per Share (Intrinsic Value) = $\frac{\text{Book Value of Equity}}{\text{No. of Equity Shares}}$           | $\frac{₹ 24,00,000}{2,00,000} = ₹12$   | $\frac{₹ 16,00,000}{1,60,000} = ₹10$   |
| (g) Return on Equity [Based on Book Value] = $\frac{\text{EAT}}{\text{Book Value of Equity}}$                            | $\frac{5,33,000}{24,00,000} = 22.21\%$ | $\frac{2,49,600}{16,00,000} = 15.60\%$ |
| (h) So, EPS = Book Value per Share × ROE as per Books, i.e.<br>This should match with EPS as per (a) = (b × d) = (f × g) | ₹2.665                                 | ₹1.56                                  |

### 2. Computation of Growth Rate

**Note:** It is assumed that the Debt Equity Ratio will be maintained in the future as well and there is no trading on equity. Therefore, Growth Rate in Equity Earnings is computed based on Return on Equity Investment and Retention Ratio. Alternatively, Sustainable Growth Rate model can be applied for computation of growth rate in Sales and Assets, which can be used as a proxy for Growth Rate in Equity Earnings as well.

Growth Rate = Return on Equity Investment × Retention Ratio (g=br)

R Ltd = 22.21% × 80% = **17.77%**

S Ltd = 15.60% × 70% = **10.92%**

### 3. Range of Justifiable Exchange Ratio based on Intrinsic Value

**Note:** The question states that because of synergies, **the Intrinsic Value** of S Ltd's Shares will be ₹25, i.e. Book Value per Share of S Ltd in the post merger scenario. Therefore, Exchange Ratio is computed based on Intrinsic Value, as Gain in Value due to Merger is expressed only for Intrinsic Value. Market Price per Share is ignored.

Range of justifiable Exchange Ratio is the range between the Minimum Exchange Ratio (from the point of Selling Company, i.e. S Ltd) and the Maximum Exchange Ratio (from the point of view of Buying Company i.e. R Ltd)

$$\text{Exchange Ratio} = \frac{[(V_S + G_S) \times S_B]}{[(V_B + G_B) \times S_S]}$$

Where,  $V_S$  = Value of Selling Company before Merger

$V_B$  = Value of Buying Company before Merger

$G_S$  = Share of Selling Company in the Gain on Value due to Merger

$G_B$  = Share of Buying Company in the Gain on Value due to Merger

$S_S$  = Shares outstanding in Selling Company before Merger

$S_B$  = Shares outstanding in Buying Company before Merger

#### (a) Computation of Value of Gain

| Particulars  | Value      |
|--|------------|
| Intrinsic Value per Share of S Ltd after Merger                              | ₹25        |
| <b>Less:</b> Intrinsic Value per Share of S Ltd before Merger                | (₹10)      |
| <b>Gain in Value per Share</b>   | <b>₹15</b> |
| Therefore, Value of Gain because of Merger [₹15 per Share × 1,60,000 Shares] | ₹24 Lakhs  |

#### (b) Exchange Ratios

| Minimum Exchange Ratio<br>(Entire Gain enjoyed by Buying Company)  | Maximum Exchange Ratio<br>(Entire Gain enjoyed by Selling Company)   |
|--|--|
| $\frac{₹ 16 \text{ Lakhs} + ₹ \text{NIL}}{₹ 24 \text{ Lakhs} + ₹ 24 \text{ Lakhs}} \times \frac{2 \text{ Lakh Shares}}{1.6 \text{ Lakh Shares}}$ | $= \frac{₹ 16 \text{ Lakhs} + ₹ 24 \text{ Lakhs}}{₹ 24 \text{ Lakhs} + ₹ \text{NIL}} \times \frac{2 \text{ Lakh Shares}}{1.6 \text{ Lakh Shares}}$ |
| <b>= 0.42 Shares of R Ltd per Share of S Ltd</b>   | <b>= 2.08 Shares of R Ltd per Share of S Ltd</b>   |

**(c) Exchange Ratios based on EPS and MPS**

|  | Based on EPS                    | Based on MPS               | Based on Intrinsic Value    |
|--|---------------------------------|----------------------------|-----------------------------|
| <b>Exchange Ratio</b> = $\frac{\text{Factor for Selling Co.}}{\text{Factor for Buying Co.}}$ | $\frac{₹ 1.56}{₹ 2.665} = 0.59$ | $\frac{₹ 20}{₹ 50} = 0.40$ | $\frac{₹ 10}{₹ 12} = 0.833$ |

**(d) Inference**

The Agreeable Exchange Ratio will be **closer** to the lower level, i.e. 0.42, because —

- (a) Growth Rate of Equity Earnings is greater for the Buying Company than the Selling Company.
- (b) Earnings Per Share and Return on Equity is also higher for the Buying Company than the Selling Company.
- (c) The Exchange Ratio based on Market Price per Share is also lower than the Minimum Exchange Ratio.

**Question 3(b): Beta, Portfolio Variance, etc.****8 Marks**

Following are the details of a portfolio consisting of three Shares:

| Share | Portfolio Weight | Beta | Expected Return in % | Total Variance |
|-------|------------------|------|----------------------|----------------|
| A     | 0.20             | 0.40 | 14                   | 0.015          |
| B     | 0.50             | 0.50 | 15                   | 0.025          |
| C     | 0.30             | 1.10 | 21                   | 0.100          |

Standard Deviation of Market Portfolio Returns = 10%

You are given the following additional data: Covariance (A, B) = 0.030, Covariance (A, C) = 0.020, Covariance (B, C) = 0.040

Calculate the following:

- (i) The Portfolio Beta, (ii) Residual Variance of each of the three Shares, (iii) Portfolio Variance using Sharpe Index Model, (iv) Portfolio Variance (on the basis of Modern Portfolio Theory given by Markowitz).

**Solution:**

**1. Determination of Portfolio Beta**

| Share Name            | Portfolio Weight | Beta | Weighted Beta |
|-----------------------|------------------|------|---------------|
| A                     | 0.20             | 0.40 | 0.08          |
| B                     | 0.50             | 0.50 | 0.25          |
| C                     | 0.30             | 1.10 | 0.33          |
| <b>Portfolio Beta</b> |                  |      | <b>0.66</b>   |

**2. Residual Variance(Using Variance Approach)**

| Particulars  | Share A                           | Share B                           | Share C                            |
|--|-----------------------------------|-----------------------------------|------------------------------------|
| Total Variance (Given)   | 0.015                             | 0.025                             | 0.100                              |
| <b>Less:</b> Systematic = Market Variance $\times \beta^2 = (SD)^2 \times \beta^2$ | $(0.1)^2 \times (0.4)^2 = 0.0016$ | $(0.1)^2 \times (0.5)^2 = 0.0025$ | $(0.1)^2 \times (1.10)^2 = 0.0121$ |
| <b>Unsystematic = Residual Variance</b>  | <b>0.0134</b>                     | <b>0.0225</b>                     | <b>0.0879</b>                      |

**3. Computation of Portfolio Variance using Sharpe Index Model**

(a) Systematic Variance of Portfolio = Market Variance  $\times (\text{Beta of Portfolio})^2 = (0.10)^2 \times (0.66)^2 = \mathbf{0.0044}$

(b) Unsystematic Variance of Portfolio = Weighted Average Unsystematic Risk of Individual Securities Portfolio

| Security     | Unsystematic Risk | Weight | Product       |
|--------------|-------------------|--------|---------------|
| A            | 0.0134            | 0.2    | 0.0027        |
| B            | 0.0225            | 0.5    | 0.0113        |
| C            | 0.0879            | 0.3    | 0.0264        |
| <b>Total</b> |                   |        | <b>0.0403</b> |

(c) **Portfolio Variance** = Systematic Variance of Portfolio + Unsystematic Variance of Portfolio = 0.0044 + 0.0403 = **0.0447**

**4. Markowitz Approach (Matrix Computation)****(a) Matrix**

| Securities |                | A                         | B                         | C                         |
|------------|----------------|---------------------------|---------------------------|---------------------------|
|            | <b>Weights</b> | $W_A = 0.20$              | $W_B = 0.50$              | $W_C = 0.30$              |
| A          | $W_A = 0.20$   | $(\sigma_A^2) = 0.015$    | $\text{Cov}(A,B) = 0.030$ | $\text{Cov}(A,C) = 0.020$ |
| B          | $W_B = 0.50$   | $\text{Cov}(A,B) = 0.030$ | $(\sigma_B^2) = 0.025$    | $\text{Cov}(B,C) = 0.040$ |
| C          | $W_C = 0.30$   | $\text{Cov}(A,C) = 0.020$ | $\text{Cov}(B,C) = 0.040$ | $(\sigma_C^2) = 0.100$    |



**(b) Computation of Portfolio Variance ( $\sigma_{ABC}^2$ )**

|  | Description                             | Computation                     | Product       |
|--|---|---------------------------------|---------------|
| 1  | $W_A \times W_A \times \sigma_A^2$      | $0.20 \times 0.20 \times 0.015$ | 0.0006        |
| 2  | $W_A \times W_B \times \text{Cov}(A,B)$ | $0.20 \times 0.50 \times 0.030$ | 0.0030        |
| 3  | $W_A \times W_C \times \text{Cov}(A,C)$ | $0.20 \times 0.30 \times 0.020$ | 0.0012        |
| 4  | $W_B \times W_A \times \text{Cov}(A,B)$ | $0.50 \times 0.20 \times 0.030$ | 0.0030        |
| 5  | $W_B \times W_B \times \sigma_B^2$      | $0.50 \times 0.50 \times 0.025$ | 0.0063        |
| 6  | $W_B \times W_C \times \text{Cov}(B,C)$ | $0.50 \times 0.30 \times 0.040$ | 0.0060        |
| 7  | $W_C \times W_A \times \text{Cov}(A,C)$ | $0.30 \times 0.20 \times 0.020$ | 0.0012        |
| 8  | $W_C \times W_B \times \text{Cov}(B,C)$ | $0.30 \times 0.50 \times 0.040$ | 0.0060        |
| 9  | $W_C \times W_C \times \sigma_C^2$      | $0.30 \times 0.30 \times 0.100$ | 0.0090        |
| <b>Variance of the Portfolio (<math>\sigma_{ABC}^2</math>)</b> |   |                                 | <b>0.0363</b> |

**Note:** Instead of Matrix Approach, Formula Approach can also be applied for computing Portfolio Variance.

**Question 4(a): Capital Budgeting****7 Marks**

A manufacturing unit engaged in the production of automobile parts is considering a proposal of purchasing one of the two Plants, details of which are given below:

| Particulars                 | Plant A     | Plant B     |
|-----------------------------|-------------|-------------|
| Cost                        | ₹ 20,00,000 | ₹ 38,00,000 |
| Installation Charges        | ₹ 4,00,000  | ₹ 2,00,000  |
| Life                        | 20 years    | 15 years    |
| Scrap Value after full life | ₹ 4,00,000  | ₹ 4,00,000  |
| Output per Minute (units)   | 200         | 400         |

The annual costs of the two Plants are as follows:

| Particulars             | Plant A   | Plant B   |
|-------------------------|-----------|-----------|
| Running Hours per annum | 2,500     | 2,500     |
| Costs: Wages            | ₹1,00,000 | ₹1,40,000 |
| Indirect Materials      | ₹4,80,000 | ₹6,00,000 |
| Repairs                 | ₹80,000   | ₹1,00,000 |
| Power                   | ₹2,40,000 | ₹2,80,000 |
| Fixed Costs             | ₹60,000   | ₹80,000   |

Will it be advantageous to buy Plant A or Plant B? Substantiate your answer with the help of comparative unit cost of the plants. Assume Interest on Capital at 10 percent. Make other relevant assumptions.

| Note: 10 percent Interest Tables                           | 20 Years | 15 Years |
|--|----------|----------|
| Present Value of ₹ 1                                       | 0.1486   | 0.2394   |
| Annuity of ₹ 1 (Capital Recovery Factor with 10% Interest) | 0.1175   | 0.1315   |

**Solution:****Computation of Equated Annual Cost for both Machines**

| Particulars                              | Cash Flow                                    | Time              | PV at 10%                   | DCF           |
|--|--|-------------------|-----------------------------|---------------|
| <b>Plant A</b>                           |  |                   |                             |               |
| Purchase Cost + Installation Charges     | (20,00,000+4,00,000)<br>= 24,00,000          | $Y_0$             | 1.0000                      | (24,00,000)   |
| Running Cost + Fixed Costs (Tax ignored) | (9,60,000)                                   | $Y_1$ to $Y_{20}$ | $\frac{1}{0.1175} = 8.5106$ | (81,70,176)   |
| Salvage Value at end                     | 4,00,000                                     | $Y_{20}$          | 0.1486                      | 59,440        |
| Total Discounted Cash Flow               |  |                   |                             | (1,05,10,736) |
| Equivalent Annual Outflow / Cost         | 1,05,10,736 × Capital Recovery Factor 0.1175 |                   |                             | (12,35,011)   |
| Output Per Annum                         | 200 Units × 2,500 Hours × 60 Minutes         |                   |                             | 3,00,00,000   |
| <b>Hence, EAC Per Unit</b>               |  |                   |                             | <b>0.0412</b> |
| <b>Plant B</b>                           |  |                   |                             |               |
| Purchase Cost + Installation Charges     | (38,00,000+2,00,000)<br>= 40,00,000          | $Y_0$             | 1.0000                      | (40,00,000)   |

| Particulars                              | Cash Flow                                    | Time                              | PV at 10%                   | DCF           |
|--|--|-----------------------------------|-----------------------------|---------------|
| Running Cost + Fixed Costs (Tax ignored) | (12,00,000)                                  | Y <sub>1</sub> to Y <sub>15</sub> | $\frac{1}{0.1315} = 7.6046$ | (91,25,520)   |
| Salvage Value at end                     | 4,00,000                                     | Y <sub>20</sub>                   | 0.1486                      | 95,760        |
| Total Discounted Cash Flow               |  |                                   |                             | (1,30,29,760) |
| Equivalent Annual Outflow / Cost         | 1,30,29,760 × Capital Recovery Factor 0.1315 |                                   |                             | (17,13,413)   |
| Output Per Annum                         | 400 Units × 2,500 Hours × 60 Minutes         |                                   |                             | 6,00,00,000   |
| <b>Hence, EAC Per Unit</b>               |  |                                   |                             | <b>0.0286</b> |

**Conclusion:** The Company may opt for Plant B, due to lower Equated Annual Cost per Unit.

**Question 4(b): Forward, Swap, Cancellation, etc.**

**9 Marks**

An Importer booked a Forward Contract with his Bank on 10<sup>th</sup> April for USD 2,00,000 due on 10<sup>th</sup> June @ ₹ 64.4000. The Bank covered its position in the market at ₹ 64.2800.

The Exchange Rates for Dollar in the Inter-Bank Market on 10<sup>th</sup> June and 20<sup>th</sup> June were:

|             | 10 <sup>th</sup> June | 20 <sup>th</sup> June |
|-------------|-----------------------|-----------------------|
| Spot USD 1  | ₹ 63.8000/8200        | ₹ 63.6800/7200        |
| Spot / June | ₹ 63.9200/9500        | ₹ 63.8000/8500        |
| July        | ₹ 64.0500/0900        | ₹ 63.9300/9900        |
| August      | ₹ 64.3000/3500        | ₹ 64.1800/2500        |
| September   | ₹ 64.6000/6600        | ₹ 64.4800/5600        |

Exchange Margin 0.10% and interest on Outlay of Funds @12%. The Importer requested on 20<sup>th</sup> June for extension of contract with due date on 10<sup>th</sup> August.

Rates rounded to 4 decimal in multiples of 0.0025.

On 10<sup>th</sup> June, Bank Swaps by selling spot and buying one month forward.

Calculate the following:

|                                    |  |
|------------------------------------|--|
| (i) Cancellation Rate              | (iv) Interest on Outlay of Funds, if any |
| (ii) Amount Payable on \$ 2,00,000 | (v) New Contract Rate                    |
| (iii) Swap Loss                    | (vi) Total Cost                          |

**Solution:**

The Importer originally agreed to buy 2,00,000 USD @ ₹ 64.40 per USD on 10<sup>th</sup> June. It is given that the Bank covered its position at ₹ 64.28 per USD. This means that the Bank has a buy contract for ₹ 64.28 per USD.

If the contract is not honoured on 10<sup>th</sup> June, the Banker will liquidate his holding, and the Importer has to bear the loss if any.

**1. Calculation of Swap Loss & Cancellation Rate:**

|   |                                 |
|---|---------------------------------|
| Rate at which USD bought = Given  | 64.2800                         |
| Banker will sell USD on 10 <sup>th</sup> June for   | (63.8000 – 0.10% margin)        |
| <b>Note:</b> Since the Banker has to sell based on that day's spot, – Bid Rate is relevant. | = 63.7362 = 63.7350             |
| Hence, Cancellation Rate = <b>63.7362 = 63.7350</b>   | (Rounded off to nearest 0.0025) |
| Loss of Banker (This will be borne by Importer) = Swap Loss on 10 <sup>th</sup> June        | 0.5450 per USD                  |
| Total Loss Amount in INR (This will be paid on 10 <sup>th</sup> June by Importer)           | 0.5450 × 2,00,000 = ₹1,09,000   |

On 10<sup>th</sup> June, the Bank rolled over the contract for one month, i.e. took a one month Forward to buy USD 2,00,000 at ₹64.0900. [Since the Banker's position is to buy and keep the FOREX ready, the Relevant Rate is Ask Rate.]

**2. Transaction on 20<sup>th</sup> June:** The Importer requests for extension till 10<sup>th</sup> August. Hence, the above contract will be reversed by taking as inverse position in the Spot Market. Any loss or gain to be borne by the Customer / Importer.

|   |           |
|---|-----------|
| Banker has agreed to buy 1 USD for  | ₹ 64.0900 |
| Banker has to enter into an agreement to sell 1 USD in July(63.9300 – 0.10% on 63.9300) rounded off | ₹ 63.8650 |
| Loss thereon (this will be borne by the Importer)   | 0.2250    |
| Total Loss Amount in INR (Importer has to pay on 20 <sup>th</sup> June) (0.2250 × 2,00,000)         | ₹ 45,000  |

### 3. New Contract Rate

|   |                |
|---|----------------|
| New Contract Rate entered on 20 <sup>th</sup> June(for the Importer, buy USD on 10 <sup>th</sup> Aug) | 64.2500        |
| (+) 0.10% Margin  | 0.06425        |
| Net Amount to Pay   | 64.3143        |
| Rounded off to nearest 0.0025   | <b>64.3150</b> |
| Amount Payable on USD 2,00,000(2,00,000 × 64.3150)  | ₹1,28,63,000   |

### 4. Interest Cost

| Time Period                                      | Days | Amount    | Interest                | ₹            |
|--|------|-----------|-------------------------|--------------|
| 10 <sup>th</sup> June to 10 <sup>th</sup> August | 71   | ₹1,09,000 | 1,09,000 × 12% × 71/365 | 2,568        |
| 20 <sup>th</sup> June to 10 <sup>th</sup> August | 51   | ₹45,000   | 45,000 × 12% × 51/365   | 755          |
| <b>Total Interest Cost</b>                       |      |           |                         | <b>3,322</b> |

**5. Total Cost**=Exchange Cost + Interest Cost + Swap Loss = 1,28,63,000 + 3,322 + 1,09,000 + 45,000 = ₹ **1,30,20,322**

### Question 5(a): Swap Ratio, Merger

11 Marks

Bank 'R' was established in 2005 and doing banking in India. The Bank is facing a DO OR DIE situation. There are problems of Gross NPA (Non-Performing Assets) at 40% & CAR/CRAR (Capital Adequacy Ratio/ Capital Risk Weight Asset Ratio) at 4%. The Net Worth of Bank is not good. Shares are not traded regularly. Last week, it was traded @ ₹ 8 per Share.

RBI Audit suggested that Bank has either to liquidate or to merge with other Bank.

Bank 'P' is a professionally managed Bank with low Gross NPA of 5%. It has Net NPA as 0% and CAR at 16%. Its Share is quoted in the market @ ₹ 128 per Share. The Board of Directors of Bank 'P' has submitted a proposal to RBI for takeover of Bank 'R' on the basis of Share Exchange Ratio.

The Balance Sheet details of both the Banks are as follows:

(₹Lakhs)

| Particulars              | Bank 'R'     | Bank 'P'      | Particulars              | Bank 'R'     | Bank 'P'      |
|--------------------------|--------------|---------------|--------------------------|--------------|---------------|
| Paid up Share Capital    | 140          | 500           | Cash in Hand & with RBI  | 400          | 2,500         |
| Reserves & Surplus       | 70           | 5,500         | Balance with Other Banks | -            | 2,000         |
| Deposits                 | 4,000        | 40,000        | Investments              | 1,100        | 15,000        |
| Other Liabilities        | 890          | 2,500         | Advances                 | 3,500        | 27,000        |
|                          |              |               | Other Assets             | 100          | 2,000         |
| <b>Total Liabilities</b> | <b>5,100</b> | <b>48,500</b> | <b>Total Assets</b>      | <b>5,100</b> | <b>48,500</b> |

It was decided to issue Shares at Book Value of Bank 'P' to the Shareholders of Bank 'R'. All Assets and Liabilities are to be taken over at Book Value.

For the Swap Ratio, Weights assigned to different parameters are as follows:

| Gross NPA | CAR | Market Price | Book Value |
|-----------|-----|--------------|------------|
| 30%       | 20% | 40%          | 10%        |

- What is the Swap Ratio based on above Weights?
- How many Shares are to be issued?
- Prepare the Balance Sheet after merger.
- Calculate CAR & Gross NPA % of Bank 'P' after Merger.

**Solution:**

#### 1. Computation of Swap Ratio

| Details      | P                       | R                   | Remarks                        | Swap Ratio          | Weight | Product       |
|--------------|-------------------------|---------------------|--------------------------------|---------------------|--------|---------------|
| GNPA         | 5                       | 40                  | R Ltd 8 times stronger (40/5)  | 1/8, i.e. 0.125:1   | 0.3    | 0.0375        |
| CAR          | 16                      | 4                   | R Ltd 4 times stronger (16/4)  | 1/4, i.e. 0.250:1   | 0.2    | 0.0500        |
| MPS          | 128                     | 8                   | R Ltd 16 times stronger(128/8) | 1/16, i.e. 0.0625:1 | 0.4    | 0.0250        |
| Book Value   | (5,500 +500)<br>= 6,000 | (140 + 70)<br>= 210 | P Ltd 3.5% of R Ltd in size    | 3.5%, i.e. 0.035:1  | 0.1    | 0.0035        |
| <b>Total</b> |                         |                     |                                |                     |        | <b>0.1160</b> |

So, **Swap Ratio = 0.116** Shares of R Ltd, for every 1 Share of P Ltd.

2. Total Share Capital of R Ltd = ₹ 140 Lakhs  
So, Share Capital to be issued by P Ltd = ₹ 140 Lakhs × 0.116 = = ₹ **16.24 Lakhs**

**3. Balance Sheet after Merger**

| Liabilities                     | Computation    | ₹Lakhs        | Assets                   | Computation     | ₹Lakhs        |
|---------------------------------|----------------|---------------|--------------------------|-----------------|---------------|
| Equity Share Capital            | (500+16.24)    | 516.24        | Cash in hand & with RBI  | (400+2,500)     | 2,900         |
| Reserves and Surplus            | (5,500+70)     | 5,570         | Balance with Other Banks |                 | 2,000         |
| Capital Reserve(on acquisition) | (Bal fig)      | 123.76        | Investments              | (11,000+15,000) | 16,100        |
| Deposits                        | (4,000+40,000) | 44,000        | Advances                 | (3,500+27,000)  | 30,500        |
| Other Liabilities               | (890+2500)     | 3,390         | Other Assets             | (100+2,000)     | 2,100         |
| <b>Total</b>                    |                | <b>53,600</b> | <b>Total</b>             |                 | <b>53,600</b> |

**4. Computation of CAR & Gross NPA (₹ Lakhs)**

|  | P Ltd                         | R Ltd                     | Total(after Merger) |
|--|-------------------------------|---------------------------|---------------------|
| Tier I +Tier II Capital(Capital +Reserves) | 5,500 + 500 = 6,000           | 140 + 70 = 210            | 6,210               |
| CAR  | 16%                           | 4%                        |                     |
| So, Risk Weighted Assets                   | $\frac{6,000}{16\%} = 37,500$ | $\frac{210}{4\%} = 5,250$ | 42,750              |
| Advances                                   | 27,000                        | 3,500                     | 30,500              |
| Gross NPA                                  | 27,000 × 5% = 1,350           | 3,500 × 40% = 1,400       | 2,750               |

$$\text{CAR (after Merger)} = \frac{6,210}{42,750} = 14.53\%$$

$$\text{Gross NPA (after merger) \%} = \frac{2,750}{30,500} = 9.02\%$$

**Question 5(b): Supplier Payment Decision**

**5 Marks**

DEF Ltd has imported goods to the extent of US\$ 1 Crore. The payment terms are 60 days Interest-free Credit. For additional credit of 30 days, Interest at the rate of 7.75% p.a. will be charged.

The Banker of DEF Ltd has offered a 30 days Loan at the rate of 9.5% p.a. Their quote for the Foreign Exchange is as follows:

|                               |       |
|-------------------------------|-------|
| Spot Rate INR/US\$            | 62.50 |
| 60 days Forward Rate INR/US\$ | 63.15 |
| 90 days Forward Rate INR/US\$ | 63.45 |

Which one of the following options would be better?

- Pay the Supplier on 60<sup>th</sup> day and avail Bank Loan for 30 days
- Avail the Supplier's offer of 90 days credit.

**Solution:**

**Similar to Page No.17.36, Q.No.20 – [RTP, N 12]**

| Particulars                      | Alternative 1                                     | Alternative 2                                       |
|----------------------------------|---|---|
| (a) Supplier's Credit            | 60 Days Nil Interest                              | 90 Days (30 Days Credit@ 7.75% p.a.)                |
| (b) Bank Loan                    | 30 Days @ 9.5% p.a.                               | NA  |
| (c) Amount in USD                | 1 Crore   | 1 Crore   |
| (d) Applicable Forward Rate      | 63.15   | 63.45   |
| (e) Amount in ₹ [(c)×(d)]        | 63.15 Crores                                      | 63.45 Crores  |
| (f) Interest in ₹                | $[63.15 \times 9.5\% \times 30/365] = 0.5$ Crores | $[63.45 \times 7.75\% \times 30/365] = 0.41$ Crores |
| (g) Total Cash Outflow [(e)+(f)] | 63.65 Crores                                      | ₹63.86 Crores                                       |

**Conclusion:** Alternative 1 is better because of lower Cash Outflow.

**Question 6(a): Lease vs Buy**

**8 Marks**

R Ltd requires a machine for 5 years. There are two alternatives either to take in on lease or buy. The Company is reluctant to invest initial amount for the project and approaches their Bankers. Bankers are ready to finance 100% of its initial required amount at 15% rate of interest for any of the alternatives.

Under Lease Option, upfront Security Deposits of ₹ 5,00,000 is payable to the Lessor which is equal to the Cost of the Machine. Out of which, 40% shall be adjusted equally against Annual Lease Rent. At the end of life of the machine, expected Scrap Value will be at Book Value after providing Depreciation @ 20% on Written Down Value as is.

Under Buying Option, Loan payment is in equal annual installments of principal amount, which is equal to Annual Lease Rent charges. However in case of Bank Finance for Lease Option, repayment of principal amount equal to Lease Rent is adjusted every year, and the balance at the end of 5<sup>th</sup> year.

Assume Income Tax Rate is 30%, Interest is payable at the end of every year and Discount Rate is @ 15% p.a. The following Discounting Factors are given:

| Year   | 1      | 2      | 3      | 4      | 5      |
|--------|--------|--------|--------|--------|--------|
| Factor | 0.8696 | 0.7562 | 0.6576 | 0.5718 | 0.4972 |

Which option would you suggest on the basis of Net Present Value?

**Solution:**

**Option 1: Borrow & Buy**

**Note:** Loan Amount = ₹5,00,000, repayable in 5 equal Annual Instalments i.e. 1,00,000 p.a. along with Interest at 15% p.a.

| Year  | 1                  | 2         | 3         | 4         | 5         |
|---|--------------------|-----------|-----------|-----------|-----------|
| 1. Loan Opening Balance                         | 5,00,000           | 4,00,000  | 3,00,000  | 2,00,000  | 1,00,000  |
| 2. Loan Principal Repayment                     | 1,00,000           | 1,00,000  | 1,00,000  | 1,00,000  | 1,00,000  |
| 3. Loan Closing Balance (1-2)                   | 4,00,000           | 3,00,000  | 2,00,000  | 1,00,000  | Nil       |
| 4. Interest at 15% on Opening Balance (15%×1)   | 75,000             | 60,000    | 45,000    | 30,000    | 15,000    |
| 5. Cost / Opening WDV                           | 5,00,000           | 4,00,000  | 3,20,000  | 2,56,000  | 2,04,800  |
| 6. Depreciation at 20% on opening WDV           | 1,00,000           | 80,000    | 64,000    | 51,200    | 40,960    |
| 7. Closing WDV (5-6)                            | 4,00,000           | 3,20,000  | 2,56,000  | 2,04,800  | 1,63,840  |
| 8. Total Expense = Interest + Depreciation(4+6) | 1,75,000           | 1,40,000  | 1,09,000  | 81,200    | 55,960    |
| 9. Tax saved at 30% on Expenses (30% × 8)       | 52,500             | 42,000    | 32,700    | 24,360    | 21,288    |
| 10. Cash Outflow (2+4-9)                        | 1,22,500           | 1,18,000  | 1,12,300  | 1,05,640  | 93,712    |
| 11. Salvage Value of Asset                      | Nil                | Nil       | Nil       | Nil       | 1,63,840  |
| 12. Net Cash Outflow (10-11)                    | 1,22,500           | 1,18,000  | 1,12,300  | 1,05,640  | 70,128    |
| 13. PV Factor at 15%                            | 0.8696             | 0.7562    | 0.6576    | 0.5718    | 0.4972    |
| 14. Discounted Cash Flow (12×13)                | 1,06,526           | 89,231.60 | 73,848.48 | 60,404.95 | 34,867.64 |
| <b>15. Total Cash Outflow</b>                   | <b>3,64,878.67</b> |           |           |           |           |

**Option 2: Borrow & Lease**

| Year   | 1                  | 2           | 3         | 4         | 5        |
|--|--------------------|-------------|-----------|-----------|----------|
| 1. Lease Rent p.a. (= Loan Principal)  | 1,00,000           | 1,00,000    | 1,00,000  | 1,00,000  | 1,00,000 |
| 2. Adjusted against Deposit (5,00,000×40%)                                     | 40,000             | 40,000      | 40,000    | 40,000    | 40,000   |
| 3. Net Lease Rent Paid   | 60,000             | 60,000      | 60,000    | 60,000    | 60,000   |
| 4. Loan Opening Balance  | 5,00,000           | 4,40,000    | 3,80,000  | 3,20,000  | 2,60,000 |
| 5. Loan Principal Repayment=Lease Rent as per (3), In Year 5 Balance Adjusted) | 60,000             | 60,000      | 60,000    | 60,000    | 2,60,000 |
| 6. Loan Closing Balance (1-2)  | 4,40,000           | 3,80,000    | 3,20,000  | 2,60,000  | Nil      |
| 7. Interest at 15% on Opening Balance (15%×1)                                  | 75,000             | 66,000      | 57,000    | 48,000    | 39,000   |
| 8. Total Expense = Lease Rent + Interest (1+7)                                 | 1,75,000           | 1,66,000    | 1,57,000  | 1,48,000  | 1,39,000 |
| 9. Tax saved at 30% on Expenses (30% × 8)                                      | 52,500             | 49,800      | 47,100    | 44,400    | 41,7000  |
| 10. Cash Outflow (3+5+7-9)   | 1,42,500           | 1,36,200    | 1,29,900  | 1,23,600  | 3,17,300 |
| 11. Refund of Security Deposit   | Nil                | Nil         | Nil       | Nil       | 3,00,000 |
| 12. Net Cash Outflow (10-11)   | 1,42,500           | 1,36,200    | 1,29,900  | 1,23,600  | 17,300   |
| 13. PV Factor at 15%   | 0.8696             | 0.7562      | 0.6576    | 0.5718    | 0.4972   |
| 14. Discounted Cash Flow (12×13)   | 1,23,918           | 1,02,994.44 | 85,422.24 | 70,674.48 | 8,601.56 |
| <b>16. Total Cash Outflow</b>  | <b>3,91,610.72</b> |             |           |           |          |

**Recommendation:** The Company should choose Option 1, i.e. Borrow and Buy the Asset, due to lower Cash Outflow.

**Question 6(b): Mutual Funds – Sharpe vs Treynor – Estimated NAV**

**8 Marks**

There are two Mutual Funds, viz. D Mutual Funds Ltd and K Mutual Fund Ltd, each having close-ended Equity Schemes.

NAV as on 31-12-2014 of Equity Schemes of D Mutual Fund Ltd is ₹ 70.71 (consisting 99% Equity and remaining cash balance) and that of K Mutual Fund Ltd, is ₹ 62.50 (consisting 96% Equity and balance in cash).

Following is the other information for the Equity Schemes.

| Particulars        | D Mutual Fund Ltd | K Mutual Fund Ltd |
|--------------------|-------------------|-------------------|
| Sharpe Ratio       | 2                 | 3.3               |
| Treynor Ratio      | 15                | 15                |
| Standard Deviation | 11.25             | 5                 |

There is no change in portfolios during the next month and Annual Average Cost is ₹ 3 per unit for the Schemes of both the Mutual Funds. If Share Market goes down by 5% within a month, calculate expected NAV after a month for the schemes of both the Mutual Funds. For calculation, consider 12 months in a year and ignore number of days for particular month.

**Solution:**

| Given Information  | D Mutual Fund  | K Mutual Fund   |
|--|--|---|
| 1. Sharpe Ratio = $\frac{\text{Return on Portfolio} - \text{Risk Free Return}}{\text{Standard Deviation of Portfolio}} = \frac{R_p - R_f}{\sigma_p}$ | $\frac{R_p - R_f}{11.25} = 2$<br>So, $R_p - R_f = 22.50$                         | $\frac{R_p - R_f}{5} = 3.3$<br>So, $R_p - R_f = 16.5$                             |
| 2. Treynor Ratio = $\frac{\text{Return on Portfolio} - \text{Risk Free Return}}{\text{Beta of Portfolio}} = \frac{R_p - R_f}{\beta_p}$               | $\frac{R_p - R_f}{\beta_p} = \frac{22.50}{\beta_p} = 15$<br>So, $\beta = 1.5$    | $\frac{R_p - R_f}{\beta_p} = \frac{16.5}{\beta_p} = 15$<br>So, $\beta = 1.10$     |
| 3. Meaning of Beta ( $\beta$ )   | If, Market goes down by 5%, Value of Share will reduce by $5 \times 1.5 = 7.5\%$ | If, Market goes down by 5%, Value of Share will reduce by $5 \times 1.10 = 5.5\%$ |
| 4. NAV as on 31.12.2014  | ₹ 70.71  | ₹ 62.50   |
| 5. Value of Equity Share   | 99% of 70.71 = ₹ 70.00   | 96% of 62.50 = ₹ 60.00  |
| 6. Value of Equity Share after 1 Month   | 70 less 7.5% = ₹ 64.75   | 60 less 5.5% = ₹ 56.70  |
| 7. Cash Balance as on 31.12.2014 (4 - 5)   | 0.71   | 2.50  |
| 8. Average Cost = $\frac{\text{₹ 3 p.u p.a}}{12}$  | (0.25)   | (0.25)  |
| 9. <b>Net Asset Value as on 31.01.2015 = 6 + 7 - 8</b>   | <b>₹ 65.21</b>   | <b>₹ 58.95</b>  |

**Question 7: Theory – Answer any four out of five.**

(4 × 4 = 16 Marks)

| Questions   | Answer / Reference  |
|---|---|
| (a) Explain the meaning of the following relating to Swap transactions:<br>(i) Plain Vanilla Swaps<br>(ii) Basis Rate Swaps<br>(iii) Asset Swaps<br>(iv) Amortising Swaps | Refer Page No.16.4, Q. No.6<br>Refer Answer below<br>Refer Answer below<br>Refer Answer below |
| (b) Distinction between Open ended Schemes and Closed ended Schemes.  | Refer Page No.8.6, Q. No.13   |
| (c) State any four assumptions of Black Scholes Model.  | Refer Page No.15.8, Q. No.10  |
| (d) Give the meaning of Caps, Floors and Collar options with respect to Interest.   | Refer Page No.16.11, Q. No.20, 21   |
| (e) Global Depository Receipts.   | Refer Page No.17.20, Q. No.34   |

**Answer to Question 7(a):**

- (ii) **Basis Rate Swaps:** These are similar to Plain Vanilla Swaps. However, in a Basis Rate Swap, both legs are Floating Rates but measured against different benchmarks. For example, a US Corporate that has a Floating Rate Bond benchmarked to US 10 year Treasury Notes could swap the Floating Interest to LIBOR (which itself is a Floating Rate). In Basis Swaps, the Initial Value of the Swap is not equal to Zero.
- (iii) **Asset Swaps:** These can be either a Plain Vanilla or a Basis Rate Swap. Instead of swapping the interest payments on the Liability, one of the parties to the Swap is swapping the Interest Receipts on an asset.
- (iv) **Amortizing Swaps:** These are Swaps for which the Notional Principal falls over its term. They are particularly useful for Borrowers who have issued Redeemable Debt. It enables them to match Interest Rate Hedging with the Redemption Profile of the Bonds.

## Additional Questions for Practice

### Question 1: Index Futures – Missing figures

RTP

Mr. Ram was employed with ABC Portfolio Consultants. The work profile of Mr. Ram involves advising the Clients about taking position in Future Market to obtain hedge in the position they are holding. Mr. Hari, their regular Client purchased 1,00,000 Shares of X Co. at a price of ₹ 22 and sold 50,000 Shares of A Co for ₹40 each having Beta 2. Mr. Ram advised Mr. Hari to take short position in Index Future trading at ₹1,000 each contract.

Though Mr. Ram noted the name of A Co. along with its Beta Value during discussion with Mr. Hari, but forgot to record the Beta Value of X Co.

On next day Mr. Hari closed out his position when:

- (a) Share Price of X Co. dropped by 2%
- (b) Share Price of A Co appreciated by 3%
- (c) Index Future dropped by 1.5%

Mr. Hari, informed Mr. Ram that he has made a loss of ₹ 1,14,500 due to the position taken. Since record of Mr. Ram was incomplete, he approached you to help him to find the number of Future Contract he advised Mr. Hari to be short to obtain a complete hedge and Beta Value of X Co.

You are required to find these values.

#### Solution: 1. Computation of Number of Future Contracts short

Let the number of Index Future Contracts short be y.

| Particulars                 | Rate  | Amount    | % of Variation | Amount                | Gain / Loss |
|-----------------------------|-------|-----------|----------------|-----------------------|-------------|
| 1,00,000 Shares of X Co     | 22    | 22,00,000 | 2%             | 44,000                | Loss        |
| 50,000 Shares of A Co       | 40    | 20,00,000 | 3%             | 60,000                | Loss        |
| 'y' Number of Index Futures | 1,000 | 1,000y    | 1.5%           | 15y                   | Loss        |
| <b>Net Effect</b>           |       |           |                | <b>1,04,000 + 15y</b> | <b>Loss</b> |

Total Loss = 1,04,000 + 15y = 1,14,500 (Given). Hence, y = 700. So, Number of Future Contract Short is **700**.

#### 2. Computation of Beta (β)

Let Beta of Shares of X Co. be β.

$$\text{Number of Contracts} = \frac{\text{Portfolio Index} \times \text{Beta of Portfolio}}{\text{Value per Future Contract}} = \frac{1,00,000 \times 22 \times \beta}{1,000} - \frac{50,000 \times 40 \times 2}{1,000} = -700$$

700 [Negative Sign indicates Sale (Short) Position]

$$\text{Beta of Shares of X Co.} = \beta = \mathbf{1.5}$$

### Question 2: Bond Valuation

RTP

Suppose Mr. A is offered a 10% Convertible Bond (Par Value ₹ 1,000) which either can be redeemed after 4 years at a premium of 5% or get converted into 25 Equity Shares currently trading at ₹ 33.50 and expected to grow by 5% each year. You are required to determine the Minimum Price Mr. A shall be ready to pay for the Bond, if his Expected Rate of Return is 11%.

#### Solution: 1. Computation of Conversion Value (CV)

CV = C (1 + g)<sup>n</sup> × R where: C = Current Market Price, R = Conversion Ratio, g = Growth Rate of Price, n = No. of years

$$\text{So, CV} = ₹ 33.50 \times (1.05)^4 \times 25 = ₹ 33.50 \times 1.2155 \times 25 = ₹ 1,017.98$$

#### 2. Computation of Value of Bond

| Year  | PVAF @ 11% | Based on Conversion Value |          |               | Based on Redemption Value         |        |                 |
|-------|------------|---------------------------|----------|---------------|-----------------------------------|--------|-----------------|
|       |            | Cash Flow                 | Amount   | PV            | Cash Flow                         | Amount | PV              |
| 1 – 4 | 3.102      | Interest (₹ 1,000 × 10%)  | 100      | 310.20        | Interest                          | 100    | 310.20          |
| 4     | 0.659      | Conversion Value          | 1,017.98 | 670.85        | Redemption Value (₹ 1,000 × 105%) | 1,050  | 691.95          |
|       |            |                           |          | <b>981.05</b> |                                   |        | <b>1,002.15</b> |

**Minimum Price:** Since Conversion Value of Bond is based on expectation of Growth in Market Price which may or may not happen as per expectations, redemption at premium shall still be guaranteed and the bond may be bought at its Floor Value based on its Redemption Value, i.e. **₹ 1,002.15**.

**Question 3: Bond Valuation**

RTP

The following data is related to 8.5% Fully Convertible (into Equity Shares) Debentures issued by JAC Ltd at ₹ 1,000.

|  |       |
|--|-------|
| Market Price of Debenture                              | ₹ 900 |
| Conversion Ratio                                       | 30    |
| Straight Value of Debenture                            | ₹ 700 |
| Market Price of Equity Share on the date of Conversion | ₹ 25  |
| Expected Dividend Per Share                            | ₹ 1   |

You are required to calculate:

- |                                   |  |
|-----------------------------------|--|
| (a) Conversion Value of Debenture | (e) Premium over Straight Value of Debenture |
| (b) Market Conversion Price       | (f) Favourable Income Differential per share |
| (c) Conversion Premium per Share  | (g) Premium Payback Period                   |
| (d) Ratio of Conversion Premium   |  |

**Solution:**

(a) Conversion Value of Debenture = Market Price of one Equity Share × Conversion Ratio = ₹ 25 × 30 = **₹ 750**

(b) Market Conversion Price =  $\frac{\text{Market Price of Convertible Debenture}}{\text{Conversion Ratio}} = \frac{₹ 900}{30} = \text{₹ } 30$

(c) Conversion Premium per Share = Market Conversion Price – Market Price of Equity Share = ₹ 30 – ₹ 25 = **₹ 5**

(d) Ratio of Conversion Premium =  $\frac{\text{Conversion Premium per Share}}{\text{Market Price of Equity Share}} = \frac{₹ 5}{₹ 25} = \text{20\%}$

(e) Premium over Straight Value of Debenture =  $\frac{\text{Market Price of Convertible Bond}}{\text{Straight Value of Bond}} - 1 = \frac{₹ 900}{₹ 700} - 1 = 28.6\%$

(f) Favourable Income differential per Share =  $\frac{\text{Coupon Interest from Debenture} - \text{Conversion Ratio} \times \text{Dividend Per Share}}{\text{Conversion Ratio}}$   
 $= \frac{₹ 85 - 30 \times ₹ 1}{30} = \text{₹ } 1.833$

(g) Premium Pay Back Period =  $\frac{\text{Conversion Premium per share}}{\text{Favourable Income Differential Per Share}} = \frac{₹ 5}{₹ 1.833} = \text{2.73 Years}$

**Question 4: Financial Services**

RTP

A Ltd has an export sale of ₹ 50 Crores of which 20% is paid by Importers in advance of despatch and for balance the average collection period is 60 days. However, it has been observed that these payments have been running late by 18 days. The past experience indicates that Bad Debt Losses are 0.6% on Sales. The expenditure incurred for efforts in Receivable Collection are ₹ 60,00,000 p.a.

So far, A Ltd had no specific arrangements to deal with Export Receivables. Following two proposals are under consideration:

- A Non-Recourse Export Factoring Agency is ready to buy A Ltd's receivables at an Interest Rate of MIBOR + 1.75% after withholding 20% as Reserve. Factoring Commission = 2%.
- Insu Ltd, an Insurance Company, has offered a Comprehensive Insurance Policy at a Premium of 0.45% of the sum insured covering 85% of risk of non-payment. A Ltd can assign its right to a Bank in return of an advance of 75% of the value insured at MIBOR+1.50%.

Assuming that MIBOR is 6% and A Ltd can borrow from its Bank at MIBOR+2% by using existing Overdraft Facility, determine the which of the two proposal should be accepted by A Ltd (1 Year = 360 days).



**Solution:** **1. Basic Computations**

|  |               |
|--|---------------|
| Total Annual Export Sales  | ₹ 50 Crores   |
| <b>Less:</b> Cash Received in Advance (20%)                                | ₹ 10 Crores   |
| Balance on 60 days credit (80%)  | ₹ 40 Crores   |
| Average Export Debtors = ₹ 40 Crores $\times \frac{78}{360}$ <b>(Note)</b> | ₹ 8.67 Crores |

**Note:** Since the payments have been running late by 18 days, Average Collection Period is taken as 60+18=78 days.

**2. Evaluation of Proposals(₹ in Crores)**

| Particulars                    | Present System                               | Non Recourse Factoring  | Insurance  |
|--------------------------------|--|---|--|
| Bad Debts                      | 0.6% × ₹40 Crores<br>(Credit Portion) = 0.24 | Nil   | 15% of 0.24 = 0.036  |
| Administration Costs           | 0.60   | Nil   | 0.60   |
| Interest on Export Debtors     | ₹8.67 Crores × 8%<br>= 0.6936                | ₹8.67 Crores × 80% × 7.75% +<br>₹8.67 Crores × 20% × 8%<br>= 0.6763 | ₹8.67 Crores × 75% × 7.5% +<br>₹8.67 Crores × 25% × 8%<br>= 0.6611 |
| Commission / Insurance Premium | Nil  | 2% × ₹40 Crores = 0.80  | 0.45% × ₹40 Crores = 0.180   |
| <b>Total Cost</b>              | <b>1.5336</b>                                | <b>1.4763</b>   | <b>1.4771</b>  |

**Conclusion:** Since, Cost of Factoring option is least, it should be accepted.

**Question 5:Capital Rationing**

**RTP**

JHK Private Ltd is considering 3 projects (not mutually exclusive) has no Cash Reserves, but could borrow upto ₹ 60 Crores at of 10% p.a. Though borrowing above this amount is also possible, but it shall be at a much higher rate of interest. The initial Capital Outlay required, the NPV and the duration of each of these project is as follows:

|           | Initial Capital Outlay (₹Crores) | NPV (₹Crores) | Duration (Years) |
|-----------|----------------------------------|---------------|------------------|
| Project X | 30.80                            | 5.50          | 6                |
| Project Y | 38.00                            | 7.20          | 7                |
| Project Z | 25.60                            | 6.50          | Indefinite       |

Other information:

1. Cost of Capital of JHK is 12%.
2. Applicable Tax Rate is 30%.
3. All Projects are indivisible in nature and cannot be postponed.

You are required to:

- (a) Comment whether given scenario is a case of Hard Capital Rationing or Soft Capital Rationing.
- (b) Which project (or combination thereof) should be accepted if these investment opportunities are likely to be repeated in future also?
- (c) Assuming that these opportunities are not likely to be available in future, and Government is ready to support Project Y on following terms then which projects should be accepted?
  - (i) A Cash Subsidy of ₹ 7 Crores shall be available.
  - (ii) 50% of Initial Cash Outlay shall be available at subsidized rate of 8% and repaid in 8 equal installments payable at the end of each year.

**Solution:** **1. Capital Rationing**

| Hard Capital Rationing   | Soft Capital Rationing  |
|--|---|
| It is a situation wherein an Entity could not raise funds beyond a certain point due to <b>external</b> circumstances / factors. | When an Entity is unable to raise funds beyond a certain limits due to reasons <b>internal</b> to the organization is the case of Soft Capital Rationing. For example, it may due to budgetary ceiling, difficulty in planning and control etc. |

**Conclusion:** Since in the given case the limitation of Loan upto ₹ 30 Crores due to unwillingness to take loan at expensive rate, it will be a case of Soft Capital Rationing.

**2. If the Projects are likely to be repeated in future**

|   | Project X | Project Y | Project Z  |
|---|-----------|-----------|------------|
| (a) NPV (₹Crore)  | 5.50      | 7.20      | 6.50       |
| (b) Duration  | 6 years   | 7 years   | Indefinite |
| (c) PVAF@12%  | 4.111     | 4.564     | 8.33       |
| (d) Equivalent Cash Inflow (₹Crore) ((a) ÷ (c)) or Equivalent NPV | 1.34      | 1.58      | 0.780      |
| (e) Ranking   | II        | I         | III        |

**Recommendation:** Since Equivalent Cash Inflow is maximum for Project Y, it should be accepted.

**3. If the projects are not repeated in the future**

**(a) Computation based on Base NPV**

| Combinations | Initial Investments (₹Crores) | NPV (₹Crores)     | Possibility  | Ranking |
|--------------|-------------------------------|-------------------|--------------|---------|
| X            | 30.80                         | 5.50              | Possible     | IV      |
| Y            | 38.00                         | 7.20              | Possible     | II      |
| Z            | 25.60                         | 6.50              | Possible     | III     |
| X & Y        | 30.80+38.00 = 68.80           | 5.50+7.20 = 12.70 | Not Possible | –       |
| Y & Z        | 38.00+25.60 = 63.60           | 7.20+6.50 = 13.70 | Not Possible | –       |
| X & Z        | 30.80+25.60 = 56.40           | 5.50+6.50 = 12.00 | Possible     | I       |

**(b) Computation based on Adjusted NPV (APV)**

|   | ₹Crore         |
|---|----------------|
| Base NPV  | 7.2000         |
| <b>Add:</b> Cash Subsidy                          | 7.0000         |
| <b>Add:</b> PV of side effect of financing (Note) | 3.1423         |
| <b>Adjusted NPV (APV)</b>                         | <b>17.3423</b> |

**Note:** Present Value of Side Effect of Financing, i.e. Subsidized Loan 50% (₹ 38 crore – ₹ 7 crore) = ₹ 15.50 crore

|  | ₹Crore        |
|--|---------------|
| Tax Benefit on Interest (₹ 15.50 Crore x 8% x 30%)                               | 0.372         |
| Post-Tax Saving of Interest [₹ 15.50 crores x 2% x (1-30%)]                      | 0.217         |
|  | 0.589         |
| Present Value of Side Effect of Financing (0.589 x 5.335 PVAF @ 10% for 8 years) | <b>3.1423</b> |

**Recommendation:** Since APV of Project Y is more than Combination X & Z, Project Y should be accepted.

**Question 6: Mergers and Acquisitions**

**RTP**

X Ltd and Y Ltd operating in same industry are not experiencing any rapid growth but providing a steady stream of Earnings. X Ltd's management is interested in acquisition of Y Ltd due to its excess plant capacity. Share of Y Ltd is trading in the market at ₹4 each. Other data relating to Y Ltd is as follows:

| Particulars                     | X Ltd      | Y Ltd      | Combined Entity |
|---------------------------------|------------|------------|-----------------|
| Profit after tax                | ₹48,00,000 | ₹3,00,000  | ₹92,00,000      |
| Residual Net Cash Flow per year | ₹60,00,000 | ₹40,00,000 | ₹1,20,00,000    |
| Required return on Equity       | 12.5%      | 11.25%     | 12.00%          |

**Summary Balance Sheet of Y Ltd**

| Assets                       | Amount(₹)          | Liabilities  | Amount(₹)          |
|------------------------------|--------------------|--|--------------------|
| Current Assets               | 2,73,00,000        | Current Liabilities                                | 1,34,50,000        |
| Other Assets                 | 55,00,000          | Long Term Liabilities                              | 1,11,00,000        |
| Property, Plant & Equipments | 2,15,00,000        | Reserve & Surplus                                  | 2,47,50,000        |
|                              |                    | Share Capital (5 Million Equity shares at ₹1 each) | 50,00,000          |
| <b>Total</b>                 | <b>5,43,00,000</b> | <b>Total</b>                                       | <b>5,43,00,000</b> |

You are required to compute:

- Minimum Price per Share Y Ltd should accept from X Ltd.
- Maximum Price per Share X Ltd shall be willing to offer to Y Ltd.
- Floor Value of per Share of Y Ltd. Whether it shall play any role in decision for its acquisition by X Ltd?

**Solution:** **1. Computation of Value of the Firm** = Value of the Firm =  $\left(\frac{FCFF}{K_e - g}\right)$

| X Ltd   | Y Ltd  | Combined Entity  |
|---|--|--|
| $\frac{60 \text{ Lakhs}}{0.125 - 0} = \text{₹}480.00 \text{ Lakhs}$ | $\frac{40 \text{ Lakhs}}{0.1125 - 0} = \text{₹}355.56 \text{ Lakhs}$ | $\frac{12 \text{ Lakhs}}{0.12 - 0} = \text{₹}1,000.00 \text{ Lakhs}$ |

**2. Computation of Gain on Merger**

| Particulars                                  | ₹Lakhs        |
|--|---------------|
| Value of Merged Entity                       | 1000.00       |
| <b>Less:</b> Value of X Ltd before Merger    | (480.00)      |
| <b>Less:</b> Value of Y Ltd before Merger    | (355.56)      |
| <b>Gain on Merger (for Synergy Benefits)</b> | <b>164.44</b> |

**3. Computation of Value of Y Ltd Shares**

| Basis                  | Book Value   | Value of the Firm   | Synergy Benefits   |
|------------------------|--|---|--|
| <b>Value Per share</b> | $\frac{297.5 \text{ Lakhs}}{50 \text{ Lakhs}} = \text{₹} 5.95$ | $\frac{355.56 \text{ Lakhs}}{50 \text{ Lakhs}} = \text{₹} 7.11$ | $\frac{355.56 \text{ Lakhs} + 164.44 \text{ Lakhs}}{50 \text{ Lakhs}} = \text{₹}10.40$ |

**4. Conclusion**

| Particulars  | Valuation Basis      | Value            |
|--|----------------------|------------------|
| Minimum Price per Share Y Ltd should accept from X Ltd   | Current Book Value   | ₹ 5.95 per share |
| Maximum Price per Share X Ltd shall be willing to offer to Y Ltd   | Synergy Benefits     | ₹10.40 per share |
| Floor Value per Share of Y Ltd (It shall not play any role in decision for the acquisition of Y Ltd as it is lower than its Current Book Value.) | Current Market Price | ₹4 per share     |

**Question 7: Mergers and Acquisitions**

RTP

ArunLtd and Kumar Ltd operate in the same field, manufacturing newly born babies's clothes. Although Kumar Ltd also has interests in communication equipments, ArunLtd is planning to take over Kumar Ltd and the Shareholders of Kumar Ltd do not regard it as a hostile bid.

The following information is available about the two companies.

| Particulars                            | Arun Ltd.     | Kumar Ltd.    |
|--|---------------|---------------|
| Current Earnings                       | ₹ 6,50,00,000 | ₹ 2,40,00,000 |
| Number of Shares                       | 50,00,000     | 15,00,000     |
| Percentage of Retained Earnings        | 20%           | 80%           |
| Return on New Investment               | 15%           | 15%           |
| Return required by Equity Shareholders | 21%           | 24%           |

Dividends have just been paid and the Retained Earnings have already been re-invested in new projects. ArunLtd plans to adopt a policy of retaining 35% of Earnings after Takeover and expects to achieve a 17% Return on New Investment.

Saving due to economies of scale are expected to be ₹ 85,00,000 per annum.

Required Return to Equity Shareholders will fall to 20% due to portfolio effects.

**Requirements**

- Calculate the existing Share Prices of Arun Ltd and Kumar Ltd.
- Find the value of ArunLtd after the takeover,
- Advise ArunLtd on the maximum amount it should pay for Kumar Ltd.

**Solution:**

**1. Calculation of Growth Rate (g)**

Growth Rate (g) = Retention Ratio (b) x Return on Investments (r) i.e.  $g = r \times b$

| Arun Ltd   | Kumar Ltd  | Arun Ltd after Takeover                               |
|--|--|---|
| $r = 15\%, b = 20\%$<br>$g = 0.15 \times 0.2 = 0.03$ or 3% | $r = 15\%, b = 8\%$<br>$g = 0.15 \times 0.8 = 0.12$ or 12% | $R = 17\%, b = 35\%$<br>$g = 0.17 \times 0.35 = 0.06$ |

**2. Calculation of Market Value**

$$\text{Ex-dividend Market Value of the Firm} = \frac{\text{Next year's dividend}}{k_e - g} = \frac{\text{Current Year's earnings} \times g \times (1 - b)}{k_e - g}$$

| Arun Ltd   | Kumar Ltd  | Arun Ltd after Takeover                              |
|--|--|--|
| $= \frac{650 \text{ Lakhs} \times 0.8 \times 1.03}{0.21 - 0.03} = ₹2,975.56 \text{ Lakhs}$ | $= \frac{240 \text{ Lakhs} \times 0.2 \times 1.12}{0.24 - 0.12} = ₹ 448 \text{ Lakhs}$ | $= \frac{665.145 \text{ Lakhs (Note)}}{0.20 - 0.06}$ |
| Market Value per Share   | Market Value per Share   |  |
| $= \frac{₹ 2975.56 \text{ Lakhs}}{50 \text{ Lakhs}} = ₹ 59.51$                             | $= \frac{₹ 448 \text{ Lakhs}}{15 \text{ Lakhs}} = ₹ 29.87$                             | $= ₹ 4,751.04 \text{ Lakhs}$                         |

**Note:** Both Companies have already re-invested their Retained Earnings at the current rate of return. Next year's earnings would be computed as follows –

|  | Computation    | ₹ Lakhs  |
|--|----------------|----------|
| Reinvested by Arun Ltd @ 3%                | 650 x 1.03     | 669.50   |
| Reinvested by Kumar Ltd @ 12%              | 240 x 1.12     | 268.80   |
| <b>Add:</b> Cost Savings                   |                | 85.00    |
| <b>Next Year's Earnings</b>                | <b>(1)</b>     | 1,023.30 |
| <b>Payout Ratio [1-Retention Ratio(b)]</b> | <b>(2)</b>     | 65%      |
| <b>Next year's dividend</b>                | <b>(1)x(2)</b> | 665.145  |

**3. Maximum Price for Kumar Ltd**

|  | ₹ Lakhs         |
|--|-----------------|
| Combined Value                                   | 4,751.04        |
| <b>Less:</b> Present Value of Arun Ltd           | 2,975.56        |
| <b>Maximum Arun Ltd should pay for Kumar Ltd</b> | <b>1,775.48</b> |

**Question 8: Mergers and Acquisitions**

RTP

A Ltd (Acquirer Company's) Equity Capital is ₹ 2,00,00,000. Both A Ltd and T Ltd (Target Company) have arrived at an understanding to maintain Debt Equity Ratio at 0.30 : 1 of the Merged Company. Pre-Merger Debt outstanding of A Ltd stood at ₹ 20,00,000 and T Ltd at ₹ 10,00,000 and Marketable Securities of both Companies stood at ₹ 40,00,000.

You are required to determine whether the liquidity of the merged Company shall remain comfortable if A Ltd acquires T Ltd against cash payment at mutually agreed price of ₹ 65,00,000.

**Solution:**

| Particulars  | ₹                |
|--|------------------|
| Debt Capacity of merged Company (2,00,00,000 × 0.30) = Target Debt | 60,00,000        |
| <b>Less:</b> Present Debt of A Ltd and T Ltd                       | 30,00,000        |
| Balance Amount Eligible for Borrowing                              | <b>30,00,000</b> |
| <b>Add:</b> Marketable Securities of both Companies                | 40,00,000        |
| <b>Total Cash &amp; Cash Equivalents available</b>                 | <b>70,00,000</b> |

**Conclusion:** Since the combined liquidity of the Merged Company > ₹ 65 Lakhs, it is feasible to pay cash for acquiring T Ltd at the price of ₹ 65 Lakhs.

**Question 9: Portfolio Management****RTP**

Following data is related to Company X, Market Index and Treasury Bonds for the current year and last 4 years:

| Year                | Company X               |                        | Market Index         |                       | Return on Treasury Bonds |
|---------------------|-------------------------|------------------------|----------------------|-----------------------|--------------------------|
|                     | Average Share Price (P) | Dividend Per Share (D) | Average Market Index | Market Dividend Yield |                          |
| 2010                | ₹ 139                   | ₹ 7.00                 | 1300                 | 3.00%                 | 7.00%                    |
| 2011                | ₹ 147                   | ₹ 8.50                 | 1495                 | 5.00%                 | 9.00%                    |
| 2012                | ₹ 163                   | ₹ 9.00                 | 1520                 | 5.50%                 | 8.00%                    |
| 2013                | ₹ 179                   | ₹ 9.50                 | 1640                 | 4.75%                 | 8.00%                    |
| 2014 (Current Year) | ₹ 203.51                | ₹ 10.00                | 1768                 | 5.50%                 | 8.00%                    |

With the above data, estimate the Beta of Company X's Share.

**Solution:****1. Computation of Average Capital Gain**

$$MP_n = CP (1+g)^n$$
 where,  $MP_n$  = Market Price at Year n, CP = Current Market Price, g = Growth Rate

| From Company X  | From Market   |
|---|---|
| $203.51 = 139 (1+g)^4$<br>$(1+g)^4 = 1.464$<br>$g = (1.464)^{1/4} - 1 = 1.10 - 1$<br>$g = 10\%$ | $1768 = 1300 (1+g)^4$<br>$(1+g)^4 = 1.36$<br>$g = (1.36)^{1/4} - 1 = 1.08 - 1$<br>$g = 8\%$ |

**2. Computation of Average Annual Dividend Yield:** Dividend Yield =  $\frac{\text{Dividend (₹)}}{\text{Share Price}} \times 100$ 

| Year          | From X Co.               |                | From Market                | Risk-Free Rate of Return |
|---------------|--------------------------|----------------|----------------------------|--------------------------|
|               | Dividend/Share Price     | Dividend Yield | Dividend Yield             | (R <sub>f</sub> )        |
| 2010          | ₹7.00 ÷ ₹139             | 5%             | 3%                         | 7%                       |
| 2011          | ₹8.50 ÷ ₹147             | 5.8%           | 5%                         | 9%                       |
| 2012          | ₹9.00 ÷ ₹163             | 5.5%           | 5.5%                       | 8%                       |
| 2013          | ₹9.50 ÷ ₹179             | 5.3%           | 4.75%                      | 8%                       |
| 2014          | ₹10.00 ÷ ₹203.51         | 4.9%           | 5.5%                       | 8%                       |
| <b>Total</b>  |                          | <b>26.5</b>    | <b>23.75</b>               | <b>40</b>                |
| Average Yield | $\frac{26.5}{5} = 5.3\%$ |                | $\frac{23.75}{5} = 4.75\%$ | $\frac{40}{5} = 8\%$     |

**3. Computation of Expected return**

Expected Return = Average Annual Capital Gain + Average Annual Dividend

|  |                 |            |        |
|--|-----------------|------------|--------|
| Expected Return from Shares of Company X | ER <sub>x</sub> | 10% + 5.3% | 15.30% |
| Expected Return from Market              | ER <sub>m</sub> | 8% + 4.75% | 12.75% |

**4. Computation of Beta (β)**

As per CAPM  $ER_x = R_f + \beta (ER_m - R_f)$   
 $15.3\% = 8\% + \beta (12.75\% - 8\%)$ . Hence,  $\beta = 1.54$

**Question 10: Economic Value Added****RTP**

ABC Ltd has divisions A, B & C. Division C has recently reported on Annual Operating Profit of ₹ 20,20,00,000. This figure arrived at after charging ₹ 3 Crores full cost of Advertisement Expenditure for launching a new product. The benefits of this expenditure is expected to be lasted for 3 years.

The Cost of Capital of Division C is 11% and Cost of Debt is 8%.

The Net Assets (Invested Capital) of Division C as per latest Balance Sheet is ₹60 Crores, but Replacement Cost of these Assets is estimated at ₹84 Crores. You are required to compute EVA of the Division C.

**Solution: 1. Computation of Operating Profits after Tax (OPAT)**

| Particulars |  | ₹            |
|-------------|--|--------------|
|             | Profit (as Given)  | 20,20,00,000 |
| <b>Add:</b> | Reversal of unutilized Advertisement Expenditure for the next 2 Years (₹3 x 2/3) | 2,00,00,000  |
|             |  | 22,20,00,000 |

**2. Computation of Economic Value Added (EVA)**

Invested Capital (as per Replacement Cost) is ₹ 84 Crores.

$$\begin{aligned} \text{EVA} &= \text{Operating Profit} - (\text{Invested Capital} \times \text{Cost of Capital}) \\ &= ₹ 22,20,00,000 - ₹ 84 \text{ Crores} \times 11\% \\ &= ₹ 22.2 \text{ Crores} - ₹ 9.24 \text{ Crores} \\ &= ₹ 12.96 \text{ Crores} \end{aligned}$$

**Question 11: Interest Rate Guarantee**

RTP

Two Companies ABC Ltd and XYZ Ltd approach the DEF Bank for FRA (Forward Rate Agreement). They want to borrow a sum of ₹ 100 Crores after 2 years for a period of 1 year. Bank has calculated Yield Curve of both Companies as follows:

| Year | XYZ Ltd | ABC Ltd |
|------|---------|---------|
| 1    | 3.86    | 4.12    |
| 2    | 4.20    | 5.48    |
| 3    | 4.48    | 5.78    |

The difference in Yield Curves due to the lower credit rating of ABC Ltd compared to XYZ Ltd.

- You are required to calculate the Rate of Interest DEF Bank would quote under 2V3 FRA, using the Company's Yield information as quoted above.
- The Bank offers Interest Rate Guarantee for a premium of 0.1% of the amount of Loan, you are required to calculate the Interest Payable by XYZ Ltd if interest in 2 years turns out to be –(a) 4.50%(b) 5.50%

**Solution: 1. 2V3 FRA – 1 Year FRA at 2 Years Forward**

| Company         | Computation   | Interest Rate |
|-----------------|---|---------------|
| <b>XYZ Ltd.</b> | $= \frac{R_2 T_2 - R_1 T_1}{T_2 - T_1} = \frac{4.48\% \times 3 \text{ Yrs} - 4.20\% \times 2 \text{ Yrs}}{3 \text{ Yrs} - 2 \text{ Yrs}} = \frac{13.44\% - 8.40\%}{1}$  | 5.04% p.a.    |
| <b>ABC Ltd.</b> | $= \frac{R_2 T_2 - R_1 T_1}{T_2 - T_1} = \frac{5.78\% \times 3 \text{ Yrs} - 5.48\% \times 2 \text{ Yrs}}{3 \text{ Yrs} - 2 \text{ Yrs}} = \frac{17.34\% - 10.96\%}{1}$ | 6.38% p.a.    |

**2. Interest Payable by XYZ Ltd**

|                          |                      | 4.50%– Allow to Lapse | 5.50%– Exercise |
|--------------------------|----------------------|-----------------------|-----------------|
| Interest                 | ₹ 100 Crores × 4.50% | ₹ 4.50 Crores         | –               |
|                          | ₹ 100 Crores × 5.04% | –                     | ₹ 5.04 Crores   |
| Premium (Cost of Option) | ₹ 100 Crores × 0.1%  | ₹ 0.10 Crores         | ₹ 0.10 Crores   |
| <b>Total</b>             |                      | 4.60 Crores           | 5.14 Crores     |

**Question 12: Leasing**

RTP

AGD Co is a profitable Company, which is considering the purchase of a Machine costing ₹ 32,00,000. If purchased, AGD Co would incur Annual Maintenance Costs of ₹ 2,50,000. The Machine would be used for three years and at the end of this period would be sold for ₹ 5,00,000. Alternatively, the Machine could be obtained under an operating Lease for an Annual Lease Rental of ₹ 12,00,000 per year, payable in advance. AGD Co can claim Depreciation @ 25% on WDV basis. Annual Lease Rental will be paid in the beginning of each year.

The Company pays tax on profits at an annual rate of 30% and all Tax Liabilities are paid one year in arrears.

**Required:**

- Using an After-Tax Borrowing Rate of 7%, evaluate whether AGD Co should purchase or lease the new machine.
- Suppose a bank had offered to lend AGD Co ₹ 32,00,000 for a period of five years interest payable every six months, then you are required to:
  - Calculate the Annual Percentage Rate (APR) implied by the Bank's offer with interest payable every six months.
  - Calculate the amount of installment payable at the end of each six-month period, if the offered loan is to be repaid in equal installments.

**Solution:**

**1. Tax Benefits on Depreciation**

| Year | Opening WDV | Deprn./ STCL      | Closing WDV | Tax Benefit=30% of Deprn./STCL | Taken in Yr |
|------|-------------|-------------------|-------------|--------------------------------|-------------|
| 1    | 32,00,000   | Deprn. = 8,00,000 | 24,00,000   | 2,40,000                       | 2           |
| 2    | 24,00,000   | Deprn. = 6,00,000 | 18,00,000   | 1,80,000                       | 3           |
| 3    | 18,00,000   | STCL = 13,00,000  | Nil         | 3,90,000                       | 4           |

**Note:** In year 3, Asset with WDV ₹ 18 Lakhs, sold for ₹ 5 Lakhs. Hence, Short term Capital Loss ₹ 13 lakhs.

**1. Evaluation of Buy Option by borrowing at 7% post tax.**

|   | Year 0      | Year 1     | Year 2     | Year 3     | Year 4   |
|---|-------------|------------|------------|------------|----------|
| (Acquisition) / Disposal                              | (32,00,000) |            |            | 5,00,000   |          |
| Tax Benefit on Depreciation / STCL                    |             |            | 2,40,000   | 1,80,000   | 3,90,000 |
| Maintenance Cost                                      |             | (2,50,000) | (2,50,000) | (2,50,000) |          |
| Tax benefit of Maintenance Cost                       |             |            | 75,000     | 75,000     | 75,000   |
| Total Cash Flow                                       | (32,00,000) | (2,50,000) | 65,000     | 5,05,000   | 4,65,000 |
| PVF@7%  | 1.00        | 0.935      | 0.873      | 0.816      | 0.763    |
| PV of Cash Flow                                       | (32,00,000) | (2,33,750) | 56,745     | 4,12,080   | 3,54,795 |
| <b>PV of Borrowing to Buy = ₹ 26,10,130 (Outflow)</b> |             |            |            |            |          |

**2. Evaluation of Lease Option**

|   | Year 0      | Year 1      | Year 2      | Year 3   | Year 4   |
|---|-------------|-------------|-------------|----------|----------|
| Lease Rental (beginning of each year)               | (12,00,000) | (12,00,000) | (12,00,000) |          |          |
| Tax Benefit on Lease Rental                         |             |             | 3,60,000    | 3,60,000 | 3,60,000 |
| Total Cash Flow                                     | (12,00,000) | (12,00,000) | (8,40,000)  | 3,60,000 | 3,60,000 |
| PVF@7%  | 1.00        | 0.935       | 0.873       | 0.816    | 0.763    |
| PV of Cash Flow                                     | (12,00,000) | (11,22,000) | (7,33,320)  | 2,93,760 | 2,74,680 |
| <b>PV of leasing Option = ₹ 24,86,880 (Outflow)</b> |             |             |             |          |          |

**Recommendation:** Lease option is preferable, since PV of outflow is lower.

**3. Computation of Annual Percentage Rate (APR)**

|  |          |
|--|----------|
| Actual Borrowing Rate = $\frac{\text{After Tax Borrowing Rate}}{100\% - \text{Tax Rate}} = \frac{7\%}{100\% - 30\%}$ | 10% p.a. |
| Interest Payable every six months  | 5%       |
| Equivalent Annual Percentage Rate = $[(1.05)^2 - 1] \times 100$  | 10.25%   |

**4. Computation of Amount of Instalment**

|  |            |
|--|------------|
| Loan Amount  | ₹32,00,000 |
| Amount of Instalment = $32,00,000 \div \text{PVAF}(10.25\%, 10) = 32,00,000 \div 7.72$ | ₹4,14,400  |

**Question 13: Capital Budgeting**

**RTP**

XYZ Food Ltd, a Franchisee of "Dosa-at-Doorstep" is considering a proposal of acquiring a fleet of motorbikes for delivery of Dosas at home of customers. Since Dosas are also delivered in late night and bikes are handled by different delivery boys (due shift working) the use of fleet will be very heavy. Hence, it is expected that the motorbike shall be virtually worthless and scrapped after a period of 3 years. However, they are taken out of services before 3 years, there will be a positive 'abandonment' Cash Flow.

The Initial Cost of the Bike will be ₹1,00,000. The expected Post Tax Benefit (Cash Inflows) from the use of Bike and Abandonment Cash Inflows are as follows:

| Year | Operating Cash Flows (₹) | Abandonment Cash Flows at end of year (₹) |
|------|--------------------------|---|
| 1    | 42,000                   | 62,000                                    |
| 2    | 40,000                   | 40,000                                    |
| 3    | 35,000                   | 0   |

The Cost of Capital of XYZFood Ltd is 10%. You are required to evaluate the proposal of acquisition of Bikes, and recommend the preferable life of the same.

**Solution:**

**1. NPV of the motor bike if operated 3 years**

| Particulars        | Year | Cash Flows (₹) | PVF @ 10% | PV of Cash Flows (₹) |
|--------------------|------|----------------|-----------|----------------------|
| Initial Investment | 0    | (1,00,000)     | 1.00      | (1,00,000)           |
| Cash Flows         | 1    | 42,000         | 0.909     | 38,178               |
|                    | 2    | 40,000         | 0.826     | 33,040               |
|                    | 3    | 35,000         | 0.751     | 26,285               |
| <b>NPV</b>         |      |                |           | <b>(2,497)</b>       |

**2. NPV of the motor bike if operated 2 years**

| Particulars        | Year | Cash Flows (₹)           | PVF @ 10% | PV of Cash Flows (₹) |
|--------------------|------|--------------------------|-----------|----------------------|
| Initial Investment | 0    | (1,00,000)               | 1.00      | (1,00,000)           |
| Cash Flows         | 1    | 42,000                   | 0.909     | 38,178               |
|                    | 2    | 40,000 + 40,000 = 80,000 | 0.826     | 66,080               |
| <b>NPV</b>         |      |                          |           | <b>4,258</b>         |

**3. NPV of the motor bike if operated 1 year**

| Particulars        | Year | Cash Flows (₹)             | PVF @ 10% | PV of Cash Flows (₹) |
|--------------------|------|----------------------------|-----------|----------------------|
| Initial Investment | 0    | (1,00,000)                 | 1.00      | (1,00,000)           |
| Cash Flows         | 1    | 42,000 + 62,000 = 1,04,000 | 0.909     | 94,536               |
| <b>NPV</b>         |      |                            |           | <b>(5,464)</b>       |

**Recommendation:** The preferable life of the Motor Bike is 2 Years, due to the highest +NPV.

**Question 14: Foreign Exchange Risk Management**

RTP

Followings are the Spot Exchange Rates quoted at three different Forex Markets:

|         |                          |
|---------|--------------------------|
| USD/INR | 59.25/ 59.35 in Mumbai   |
| GBP/INR | 102.50/ 103.00 in London |
| GBP/USD | 1.70/ 1.72 in New York   |

The Arbitrageur has USD1,00,00,000. Assuming that the Bank wishes to retain an Exchange Margin of 0.125%, explain whether there is any arbitrage gain possible from the quoted Spot Exchange Rates.

The Arbitrageur can proceed as stated below to realize Arbitrage Gains.

**Solution:**

| Step   | Computation   | Result  |
|--|---|---|
| 1. Buy GBP at New York for USD 1,00,00,000         | GBP/USD = 1.72 + Exchange Margin @ 0.125%<br>= 1.72 + 0.002 = 1.722     | GBP acquired in exchange of USD<br>= USD 1,00,00,000 ÷ 1.722<br>= GBP 58,07,200 |
| 2. Sell the above GBP at London Market and get INR | GBP/INR = 102.50 – Exchange Margin @ 0.125%<br>= 102.50 – 0.13 = 102.37 | INR on conversion of GBP<br>= GBP 58,07,200 × 102.37<br>= INR 59,44,83,064      |
| 3. Acquire USD by selling INR at Mumbai            | USD/INR = 59.35 + Exchange Margin @ 0.125%<br>= 59.35 + 0.07 = 59.42    | USD acquired in exchange of INR<br>= 59,44,83,064 ÷ 59.42<br>= USD 1,00,04,763  |

**Conclusion: Net Gain = USD 1,00,04,763 – USD 1,00,00,000 = USD 4,763**