

# Business Valuation [8 Marks]

PART I EVA & MVA

PART II Valuation of Business

PART III Gearing of Beta

## PART I Economic Value added

EVA means surplus after providing cost to Capital providers

Step 1 Calculate Net operating profit after tax (NOPAT)

EBIT  
(-) Tax  
NOPAT

xx  
xx  

---

xxx

OR  $NOPAT = EBIT(1-t)$

Step 2 Calculate EVA

$EVA = NOPAT - \text{Invested Capital} \times WACC$

### Example - 01

ESC (50,000 share @ 10) = ₹ 5,00,000

12 % PSC = ₹ 3,00,000

10% debentures = ₹ 2,00,000

EBIT = ₹ 2,40,000

Tax = 30%

$R_f$  = 6%

$R_m$  = 11%

Beta = 1.25

Calculate Economic Value Added.

(Page No. 01)

### 1 Calculate NOPAT

$$\begin{aligned} \text{NOPAT} &= \text{EBIT} (1-t) \\ &= 240000 (1-0.30) \\ &= ₹ 168000 \end{aligned}$$

### 2. WACC

$$\begin{aligned} K_e &= R_f + \beta (R_m - R_f) \\ &= 6 + 1.25 (11 - 6) = 12.25\% \end{aligned}$$

$$K_d = I(1-t) = 10 (1-0.30) = 7\%$$

$$\begin{aligned} \text{WACC} &= \frac{(500000 \times 12.25) + (300000 \times 10) + (200000 \times 7)}{1000000} \\ &= 11.125\% \end{aligned}$$

### 3 EVA

$$\begin{aligned} \text{EVA} &= \text{NOPAT} - \text{Invested Capital} \times \text{WACC} \\ &= ₹ 168000 - (100000 \times 11.125\%) \\ &= ₹ 56750 \end{aligned}$$

### QUESTION - 01

Delta Ltd.'s current financial year's income statement reports its net income as ₹ 15,00,000. Delta's marginal tax rate is 40% and its interest expense for the year was ₹ 15,00,000. The company has ₹ 1,00,00,000 of invested capital, of which 60% is debt. In addition, Delta Ltd. tries to maintain a Weighted Average Cost of Capital (WACC) of 12.6%.

- (i) Compute the operating income or EBIT earned by Delta Ltd. in the current year.
- (ii) What is Delta Ltd.'s Economic Value Added (EVA) for the current year?
- (iii) Delta Ltd. has 2,50,000 equity shares outstanding. According to the EVA you computed in (ii), how much can Delta pay in dividend per share before the value of the company would start to decrease? If Delta does not pay any dividends, what would you expect to happen to the value of the company?

(Study Material & PM)

(Page No. 01)

### ① EBIT

$$(EBIT - Int) (1 - t) = PAT$$

$$(x - 1500000) (1 - 0.40) = 1500000$$

$$x = \frac{1500000}{0.60} + 1500000$$

$$= ₹ 4000000$$

### ② EVA

$$\begin{aligned} EVA &= EBIT(1 - t) - \text{Invested Capital} \times WACC \\ &= 4000000(1 - 0.40) - (10000000 \times 12.6\%) \\ &= 2400000 - 1260000 = ₹ 1140000 \end{aligned}$$

24%

### (iii) EVA Dividend

$$\text{EVA dividend} = \frac{\text{₹}1140000}{250000} = \text{₹}4.56$$

Since Expected Return (24%) is more than WACC (12.6%), then Company should not pay dividend. If delta does not pay dividend value of firm will increase

### QUESTION - 02

The following data pertains to XYZ Inc. engaged in software consultancy business as on 31 December 2010.

(\$ Million)

|                         |               |
|-------------------------|---------------|
| Income from consultancy | 935.00        |
| EBIT                    | 180.00        |
| Less: Interest on Loan  | <u>18.00</u>  |
| EBT                     | 162.00        |
| Tax @ 35%               | <u>56.70</u>  |
|                         | <u>105.30</u> |

### Balance Sheet

(\$ Million)

| Liabilities                                  | Amount     | Assets                 | Amount     |
|--|------------|------------------------|------------|
| Equity Stock (10 million share @ \$ 10 each) | 100        | Land and Building      | 200        |
| Reserves & Surplus                           | 325        | Computers & Software's | 295        |
| Loans  | 180        | Current Assets:        |            |
| Current Liabilities                          | 180        | Debtors                | 150        |
|  |            | Bank                   | 100        |
|  |            | Cash                   | <u>40</u>  |
|  | <u>785</u> |                        | <u>290</u> |
|  |            |                        | <u>785</u> |

With the above information and following assumption you are required to compute

## 1 EVA

$$\begin{aligned} \text{NOPAT} &= \text{EBIT}(1-t) \\ &= \$180(1-0.35) = \$117 \end{aligned}$$

$$\begin{aligned} C/E &= \$100 + \$325 + \$180 \\ &= \$605 \end{aligned}$$

$$\begin{aligned} \text{EVA} &= \text{NOPAT} - C/E \times WACC \\ &= \$117 - \$605 \times 12\% \\ &= \$44.40 \text{ millions} \end{aligned}$$

(a) Economic Value Added

(b) Market Value Added.

Assuming that:

(i) WACC is 12%.

(ii) The share of company currently quoted at \$ 50 each

(Study Material & PM)

(Page No. 02)

$$\begin{aligned} \text{MVA} &= \text{M.V. of C/E} - \text{B.V. of C/E} \\ &= \$680 - \$605 \\ &= \$75 \text{ m} \end{aligned}$$

## (ii) MVA

### Method I

$$\text{mva} = \frac{\text{EVA}}{\text{WACC}} = \frac{\$44.40}{12\%} = \$370 \text{M}$$

### Method II (ICAT)

|      | B.V.         | M.V.               |
|------|--------------|--------------------|
| ESC  | \$100        | \$500 (10m x \$50) |
| RFS  | \$325        | -                  |
| Loan | \$180        | \$180              |
|      | <u>\$605</u> | <u>\$680</u>       |

### QUESTION – 03

Herbal Gyan is a small but profitable producer of beauty cosmetics using the plant Aloe Vera. This is not a high-tech business, but Herbal's earnings have averaged around ₹ 12 lakh after tax, largely on the strength of its patented beauty cream for removing the pimples.

The patent has eight years to run, and Herbal has been offered ₹ 40 lakhs for the patent rights. Herbal's assets include ₹ 20 lakhs of working capital and ₹ 80 lakhs of property, plant, and equipment. The patent is not shown on Herbal's books. Suppose Herbal's cost of capital is 15 percent. What is its Economic Value Added (EVA)?

(Study Material & PM)

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EVA

Invested Capital

$$(80 + 20 + 40) = 140 \text{ lakh}$$

$$\begin{aligned} \text{EVA} &= 12 - (140 \times 15\%) \\ &= 9 \text{ L} \end{aligned}$$

### QUESTION - 04

Constant Engineering Ltd. has developed a high tech product which has reduced the Carbon emission from the burning of the fossil fuel. The product is in high demand. The product has been patented and has a market value of ₹ 100 Crore, which is not recorded in the books. The Net Worth (NW) of Constant Engineering Ltd. is ₹ 200 Crore. Long term debt is ₹ 400 Crore. The product generates a revenue of ₹ 84 Crore. The rate on 365 days Government bond is 10 percent per annum. Market portfolio generates a return of 12 percent per annum. The stock of the company moves in tandem with the market. Calculate Economic Value added of the company.

(SM, PM & Exam May - 2018)

(Page No. 05)

### EVA

$$\text{NOPAT} = ₹ 84 \text{ cr.}$$

Invested Capital

$$\text{NW} = 200 + 100 = 300$$

$$\text{Loan} = \frac{400}{700}$$

$$K_e = 12\% \quad K_d = 10\%$$

$$\text{WACC} = \frac{(300 \times 12) + (400 \times 10)}{700} = 10.85\%$$

$$\begin{aligned} \text{EVA} &= 84 - 700 \times 10.85\% \\ &= 8.05 \text{ cr.} \end{aligned}$$

### QUESTION - 05

The following information is given for 3 companies that are identical except for their capital structure:

|                         | Orange   | Grape    | Apple    |
|-------------------------|----------|----------|----------|
| Total invested capital  | 1,00,000 | 1,00,000 | 1,00,000 |
| Debt/assets ratio       | 0.8      | 0.5      | 0.2      |
| Shares outstanding      | 6,100    | 8,300    | 10,000   |
| Pre tax cost of debt    | 16%      | 13%      | 15%      |
| Cost of equity          | 26%      | 22%      | 20%      |
| Operating Income (EBIT) | 25,000   | 25,000   | 25,000   |

The tax rate is uniform 35% in all cases.

- Compute the Weighted average cost of capital for each company.
- Compute the Economic Value Added (EVA) for each company.
- Based on the EVA, which company would be considered for best investment? Give reasons.
- If the industry PE ratio is 11x, estimate the price for the share of each company.
- Calculate the estimated market capitalization for each of the Companies.

(SM, PM & MTP April - 2022) (Page No. 06)

### ① WACC

|                  | O      | G       | A      |
|------------------|--------|---------|--------|
| Invested Capital | 100000 | 100000  | 100000 |
| Debt             | 80000  | 50000   | 20000  |
| $K_d = i(1-t)$   | 10.4%  | 8.45%   | 9.75%  |
| Equity           | 20000  | 50000   | 80000  |
| $K_e$            | 26%    | 22%     | 20%    |
| WACC             | 13.52% | 15.225% | 17.95% |

## ② EVA

$$EVA = EBIT(1-t) - \text{Invested Cap.} \times WACC$$

$$\text{Orange} = 25000(1-0.35) - 100000 \times 13.52\% = 2730$$

$$\text{Grape} = 25000(1-0.35) - 100000 \times 15.225\% = 1025$$

$$\text{Apple} = 25000(1-0.35) - 100000 \times 17.95\% = -1700$$

③ on the basis of EVA, Company/Orange will be considered for best Investment due to the highest EVA & lowest WACC.

## ④ Estimated MPS

|                 | O     | G     | A     |
|-----------------|-------|-------|-------|
| EBIT            | 25000 | 25000 | 25000 |
| (-) Intt        | 12800 | 6500  | 3000  |
| EBT             | 12200 | 18500 | 22000 |
| (-) Tax @ 35%   | 4270  | 6475  | 7700  |
| EAT             | 7930  | 12025 | 14300 |
| ÷ No. of shares | 6100  | 8300  | 10000 |
| EPS             | 1.30  | 1.45  | 1.43  |
| (x) P/E         | 11    | 11    | 11    |
| MPS             | 14.30 | 15.95 | 15.73 |

## (v) Market Cap

$$O = 6100 \times 14.30$$

$$= ₹ 87230$$

$$G = 8300 \times 15.95$$

$$= ₹ 132385$$

$$A = 10000 \times 15.73$$

$$= ₹ 157300$$

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### QUESTION – 06

Tender Ltd has earned a net profit of ₹ 15 lacs after tax at 30%. Interest cost charged by financial institutions was ₹ 10 lacs. The invested capital is ₹ 95 lacs of which 55% is debt. The company maintains a weighted average cost of capital of 13%.

Required:

- (a) Compute the operating income.
- (b) Compute the Economic Value Added (EVA).
- (c) Tender Ltd. has 6 lac equity shares outstanding. How much dividend can the company pay before the value of the entity starts declining?

(Study Material & PM)

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### QUESTION - 07

With the help of the following information of Jatayu Limited compute the Economic Value Added:

|                    |                      |             |
|--------------------|----------------------|-------------|
| Capital Structure  | Equity capital       | ₹ 160 Lakhs |
|                    | Reserves and Surplus | ₹ 140 lakhs |
|                    | 10% Debentures       | ₹ 400 lakhs |
| Cost of equity     | 14%                  |             |
| Financial Leverage | 1.5 times            |             |
| Income Tax Rate    | 30%                  |             |

(Study Material & PM)

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### NOPAT

$$DFL = \frac{EBIT}{EBT}$$

$$1.5 = \frac{EBIT}{EBIT - 40}$$

$$1.5 EBIT - 60 = EBIT$$

$$0.5 EBIT = 60$$

$$EBIT = \frac{60}{0.5} = 120$$

## WACC

$$K_d = I(1-t)$$

$$= 10(1-0.30) = 7\%$$

$$WACC = \frac{(300 \times 14) + (400 \times 7)}{700}$$
$$= 10\%$$

$$EVA = EBIT(1-t) - C/E \times WACC$$

$$= 120(1-0.30) - 700 \times 10\%$$

$$= ₹ 14 \text{ lakhs}$$

## QUESTION – 08

Compute Economic Value Added (EVA) of Good luck Ltd. from the following information:

### **Profit & Loss Statement**

| Particulars                              | (₹ in Lakh) |
|--|-------------|
| (a) Income –<br>Revenue from Operations  | 2000        |
| (b) Expenses –<br>Direct Expenses        | 800         |
| Indirect Expenses                        | 400         |
| (c) Profit before interest & tax (a – b) | 800         |
| (d) Interest                             | 30          |
| (e) Profit before tax (c – d)            | 770         |
| (f) Tax                                  | 231         |
| (g) Profit after tax (e – f)             | 539         |

### **Balance Sheet**

| Particulars                                      | (₹ in Lakh) |
|--|-------------|
| <b>Equity and Liabilities :</b>                  |             |
| (a) Shareholder's Fund –<br>Equity Share Capital | 1000        |
| Reserve and Surplus                              | 600         |

## WACC

$$K_d = I(1-t)$$
$$= 15(1-0.30) = 10.5\%$$

$$WACC = \frac{(1600 \times 12) + (200 \times 10.5)}{1800}$$
$$= 11.83\%$$

## NOPAT

|               |                |
|---------------|----------------|
| EBIT          | 800            |
| (-) Tax       | 231            |
| (+) provision | 40             |
|               | <hr/>          |
| NOPAT =       | <u>₹ 609 L</u> |

|  |             |
|--|-------------|
| (b) Non- Current Liabilities –<br>Long Term Borrowings | 200         |
| (c) Current Liabilities                                | 800         |
| <b>Total</b>   | <b>2600</b> |
| <b>Assets :</b>  |             |
| (a) Non - Current Assets                               | 2000        |
| (b) Current Assets                                     | 600         |
| <b>Total</b>   | <b>2600</b> |

Other Information:

- (1) Cost of Debts is 15%.
- (2) Cost of Equity (i.e. shareholders' expected return) is 12%.
- (3) Tax Rate is 30%.
- (4) Bad Debts Provision of ₹ 40 lakhs is included in indirect expenses and ₹ 40 lakhs reduced from receivables in current assets.

(Exam May – 2019)

(Page No. 09)

$$\begin{aligned}
 \text{EVA} &= \text{NOPAT} - \text{Invested Capital} \times \text{WACC} \\
 &= ₹ 609 - (1840 \times 11.83\%) \\
 &= ₹ 391.33 \text{ Lakhs}
 \end{aligned}$$

| <u>Invested Capital</u> |                     |
|-------------------------|---------------------|
| Equity                  | 1600 + provision 40 |
| Debt                    | 200                 |
|                         | <u>1840</u>         |

### QUESTION – 09

Herbal Box is a small but profitable producer of beauty cosmetics using the plant Aloe Vera. Though it is not a high-tech business, yet Herbal's earnings have averaged around ₹ 18.50 lakhs after tax, mainly on the strength of its patented beauty cream to remove the pimples.

The patent has nine years to run, and Herbal Box has been offered ₹ 50 lakhs for the patent rights. Herbal's assets include ₹ 50 lakhs of property, plant and equipment, and ₹ 25 lakhs of working capital. However, the patent is not shown on the books of Herbal Box. Assuming Herbal's cost of capital being 14 percent, calculate its Economic Value Added (EVA).

(Exam November - 2018, 2020 & RTP May-2022)

(Page No. 11)

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### QUESTION - 11

Following is the information of M/s. DY Ltd. for the year ending 31/03/2021:

| Particulars                                    |             |
|--|-------------|
| Sales  | ₹ 1000 Lakh |
| Operating Expenses Including Interest          | ₹ 620 Lakh  |
| 8% Debentures                                  | ₹ 250 Lakh  |
| Equity Share Capital (Face Value of ₹ 10 each) | ₹ 250 Lakh  |
| Reserves and Surplus                           | ₹ 250 Lakh  |
| Market Value of DY Ltd.                        | ₹ 900 Lakh  |
| Corporate Tax Rate                             | 30%         |
| Risk Free Rate of Return                       | 7%          |
| Market Rate of Return                          | 12%         |
| Equity Beta                                    | 1.4         |

You are required to

- Calculate Weighted Average Cost of Capital of DY Ltd.
- Calculate Economic Value Added
- Calculate Market Value Added

(Exam December - 2021) (Page No. 13)

### 1 WACC

$$K_e = R_f + (R_m - R_f)\beta$$

$$= 7 + (12 - 7)1.4 = 14\%$$

$$K_d = I(1 - t)$$

$$= 8(1 - 0.30) = 5.6\%$$

$$WACC = \frac{(500 \times 14) + (250 \times 5.6)}{750}$$

$$= 11.2\%$$

## (ii) EVA

|                     |             |
|---------------------|-------------|
| Sales =             | ₹ 1000 L    |
| (-) Operating Exp = | ₹ 600 L     |
| [620 - 20]          | <hr/>       |
| EBIT                | 400         |
| (-) Tax @ 30%       | <hr/>       |
|                     | 120         |
| NOPAT               | <hr/> <hr/> |
|                     | 280         |

$$\begin{aligned} \text{EVA} &= \text{NOPAT} - \text{C/E} \times \text{WACC} \\ &= 280 - 750 \times 11.2\% \\ &= 196 \text{ Lakhs} \end{aligned}$$

## (iii) MVA

$$\begin{aligned} \text{MVA} &= \text{M.V. of CE} - \text{B.V. of CE} \\ &= 900 - 750 \\ &= ₹ 150 \text{ L} \end{aligned}$$

# PART II Valuation of firm

## (I) Asset Based Valuation

1. Net Asset Method  
(Book Value Method)

$$V_B = \text{Asset} - \text{Liabilities} \text{ [B.V.]}$$

2. Realisable Value Method

$$V_f = \text{Asset} - \text{Liab.} \text{ [M.V.]}$$

3. Replacement Method

$$V_p = A - L \text{ (Replacement Value)}$$

## (II) Earnings Based Valuation

- (1.) Price Earning Model

$$V_B = \text{Earnings} \times \text{P/E Ratio}$$

- (2.) Earning Capitalization Method

$$V_B = \frac{\text{Earnings}}{K_0}$$

## (III) Cash Flows Based Valuation

- FCFF Model

3 most imp

# Free Cash flows for firm

- 9.1 Capital Budgeting Cash flows are Calculated as under

|                                    |     |
|------------------------------------|-----|
| Sales                              | xxx |
| (-) operating Exp<br>Excluding Dep | xxx |
| EBITDA                             | xxx |
| (-) Dep                            | xx  |
| EBIT                               | xxx |
| (-) Tax                            | xxx |
| NOPAT                              | xxx |
| (+) Dep                            | xxx |
| CFAT                               | xxx |

CFF

## FCFF

|                               |     |
|-------------------------------|-----|
| CFAT                          | xxx |
| (-) Capital Expenditure       | xxx |
| (-) change in Working Capital | xxx |
| FCFF                          | xxx |

Discounting with WACC

$$V = VF$$

$$V_E = V_F - V_D$$

## FCFE

(Free Cash flows for Equity)

|         |     |
|---------|-----|
| EBIT    | xxx |
| (-) Int | xxx |
| EBT     | xxx |
| (-) Tax | xxx |
| PAT     | xxx |
| (+) Dep | xxx |
| CFAT    | xxx |

(only Equity portion)

FCFE  
Disc. with  $r_e = V_E$

### Example - 02

Calculate Value of Business  
Free Cash For Firm (FCFF)

Year 1      8,00,000

Year 2      12,00,000

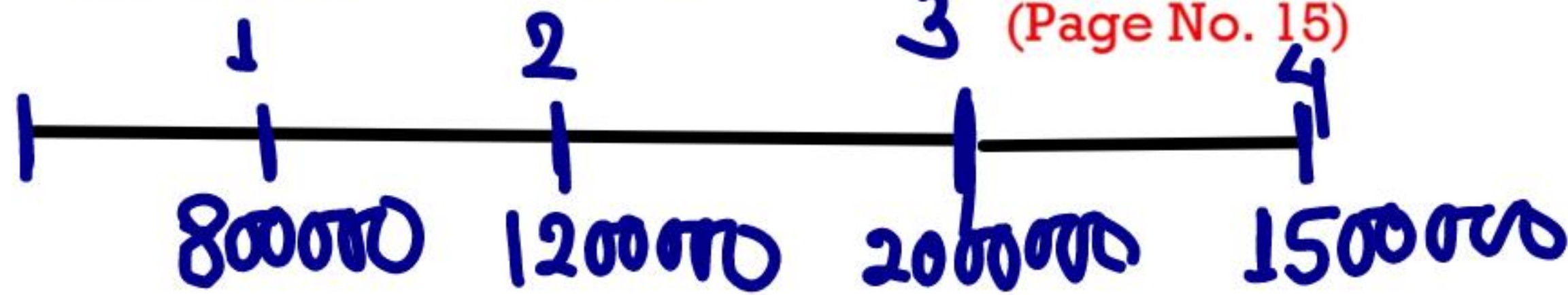
Year 3      20,00,000

FCFF at the end of 4<sup>th</sup> years = 15,00,000 p.a

$K_0 = 12\%$

$g = 4\%$  p.a. after 4 years.

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### Terminal Value

$$\begin{aligned} TV_4 &= \frac{FCFF_5}{K_0 - g} \\ &= \frac{15,00,000(1.04)}{0.12 - 0.04} \\ &= ₹ 19,50,000 \end{aligned}$$

$$\begin{aligned} V_F &= \frac{8,00,000}{(1.12)^1} + \frac{12,00,000}{(1.12)^2} \\ &+ \frac{20,00,000}{(1.12)^3} + \frac{15,00,000}{(1.12)^4} + \frac{19,50,000}{(1.12)^4} \\ &= 12,79,73,781 \end{aligned}$$

**Example - 03**

Sales 25,00,000 p.a.

VC @ 30%

Fixed Cost = 2,00,000 p.a.

(Excluding depreciation)

Depreciation = ₹ 1,25,000 p.a.

Interest = 1,12,000

Tax = 30%

Calculate FCFF.

Capital  
Exp = 180000  
ΔWC = 32000

FCFF

Sales = 2500000

(-) operating  
Cost  
(750000 + 200000) 950000

EBITDA 1550000

(-) Dep 125000

EBIT 1425000

(-) Tax @ 30% 427500

NOPAT 997500

(+) Dep 125000

CFAT 1122500

(-) CE 180000

(-) ΔWC 32000

FCFF 910500

FCFF

NOPAT

(-) [C.E - Dep]  
(180000 - 125000)

(-) ΔWC

FCFF

997500

55000

32000

910500

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**Example - 04**

✓ EBIT = ₹ 3,00,000

Tax = 40%

Capital Expenditure = 75,000

Depreciation = 75,000

Change in working capital = 0

Calculate FCFF.

If C.E = Dep means  
C.E. offsets Dep.

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|               | <u>FCFF</u>   |
|---------------|---------------|
| EBIT          | 300000        |
| (-) Tax @ 40% | <u>120000</u> |
| NO PAT / FCFF | <u>180000</u> |

### Example - 05

Base Year

Sales = ₹ 5,00,000

Operating Expenditure = ₹ 1,25,000 (Including Depreciation)

Tax = 30%

Capital Expenditure = 1,45,000

Depreciation = 30,000

Sales & operating expenditure will grow by ~~20~~<sup>15%</sup> in next 3 years & there after 10% p.a. perpetual.

Capital Expenditure net of depreciation will grow by 15% in next 3 years & from 4<sup>th</sup> year capital expenditure is equal to depreciation.

Working Capital should be 10% of sales

$K_0 = 15\%$

Calculated (1) Value of Firm

(2) ~~Value of Equity~~

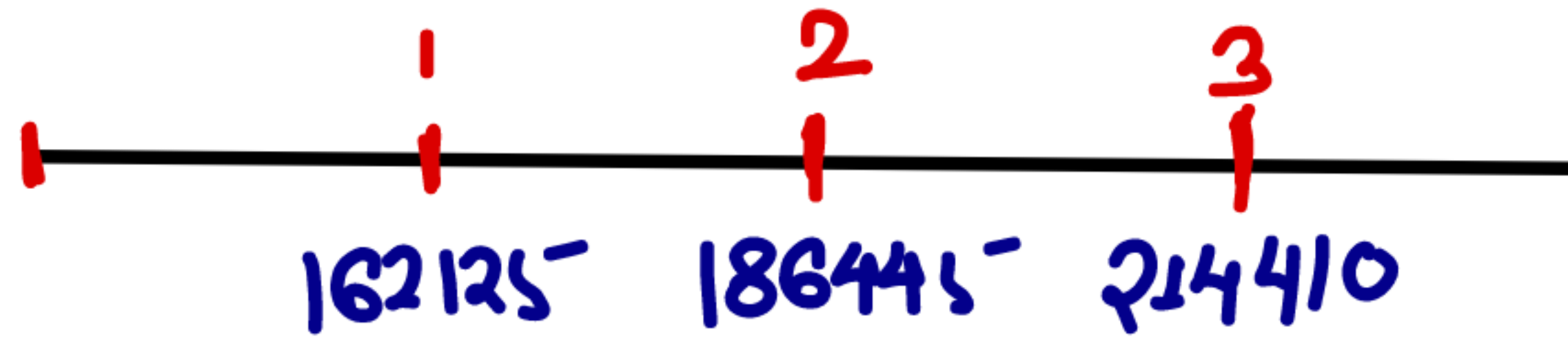
(Page No. 16)

## Calculation of FCFF

|                             | 1      | 2      | 3      | 4      |
|-----------------------------|--------|--------|--------|--------|
| Sale (500000)               | 575000 | 661250 | 760438 | 836481 |
| (-) operating Cost (125000) | 143750 | 165312 | 190109 | 209120 |
| EBIT (375000)               | 431250 | 495938 | 570329 | 627361 |
| (-) Tax @ 30%               | 131175 | 148781 | 171099 | 188208 |
| NOPAT                       | 301875 | 347157 | 399230 | 439153 |
| (-) (C.E - Dep) (15000)     | 132250 | 152087 | 174901 | -      |
| 7500                        | 7500   | 8695   | 9919   | 7604   |
| (-) ΔWC (W.N.L)             |        |        |        |        |
| FCFF                        | 162125 | 186445 | 214410 | 431549 |

# W.N.1 change in Working Capital

|                   | 0      | 1      | 2      | 3      | 4      |
|-------------------|--------|--------|--------|--------|--------|
| <b>Sales</b>      | 500000 | 575000 | 661250 | 760438 | 836481 |
| WC maintain @ 10% | 50000  | 57500  | 66125  | 76044  | 83648  |
| $\Delta$ in WC    | -      | 7500   | 8625   | 9919   | 7604   |



$$\begin{aligned}
 V_f &= \frac{162125}{(1.15)^1} + \frac{186445}{(1.15)^2} \\
 &+ \frac{214410}{(1.15)^3} + \frac{8630820}{(1.15)^3} \\
 &= ₹6097840
 \end{aligned}$$

A dashed horizontal line with a tick mark on the left side.

$$\begin{aligned}
 TV_3 &= \frac{fcff_4}{k_0 - g} \\
 TV_3 &= \frac{431541}{0.15 - 0.10} = 8630820
 \end{aligned}$$

### QUESTION - 15

Following information are available in respect of XYZ Ltd. which is expected to grow at a higher rate for 4 years after which growth rate will stabilize at a lower level:

Base year information:

|                     |                  |
|---------------------|------------------|
| Revenue             | - ₹ 2,000 crores |
| EBIT                | - ₹ 300 crores   |
| Capital expenditure | - ₹ 280 crores   |
| Depreciation        | - ₹ 200 crores   |

Information for high growth and stable growth period are as follows:

|  | High Growth | Stable Growth                                  |
|--|-------------|--|
| Growth in Revenue & EBIT                       | 20%         | 10%  |
| Growth in capital expenditure and depreciation | 20%         | Capital expenditure are offset by depreciation |

### W.N. 1 WACC (K<sub>0</sub>)

$$K_e = R_f + (R_m - R_f) \beta$$

$$K_d = I(1-t)$$

#### High Growth

$$K_e = 10 + 6 \times 1.15 = 16.9\%$$

$$K_d = 13(1 - 0.30) = 9.1\%$$

$$WACC = (16.9 \times 0.5) + (9.1 \times 0.5) = 13\%$$

#### Stable Growth

$$K_e = 9 + 5 \times 1 = 14\%$$

$$K_d = 12.86(1 - 0.30) = 9\%$$

$$WACC = (14 \times 0.6) + (9 \times 0.4) = 12\%$$

|                      |       |        |
|----------------------|-------|--------|
| Risk free rate       | 10%   | 9%     |
| Equity beta          | 1.15  | 1      |
| Market risk premium  | 6%    | 5%     |
| Pre tax cost of debt | 13%   | 12.86% |
| Debt equity ratio    | 1 : 1 | 2 : 3  |

For all time, working capital is 25% of revenue and corporate tax rate is 30%. What is the value of the firm?

(SM & MTP March – 2022)

(Page No. 20)

## FCFF (Cr.)

|                    | 1          | 2             | 3             | 4             | Terminop<br>YEAR |
|--------------------|------------|---------------|---------------|---------------|------------------|
| EBIT (300)         | 360        | 432           | 518.40        | 622.08        | 684.29           |
| (-) Tax @ 30%      | 108        | 129.60        | 155.52        | 186.62        | 205.29           |
| <b>NOPAT</b>       | <b>252</b> | <b>302.40</b> | <b>362.88</b> | <b>435.46</b> | <b>479.00</b>    |
| (-) [C.E-Dep] (80) | 96         | 115.20        | 138.24        | 165.89        | —                |
| (-) ΔWC (W.N.2)    | 100        | 120           | 144           | 172.80        | 103.68           |
| <b>FCFF</b>        | <b>56</b>  | <b>67.20</b>  | <b>80.64</b>  | <b>96.77</b>  | <b>375.32</b>    |

$$\begin{aligned}
 T.V_4 &= \frac{FCFF_5}{k_0 - g} \\
 &= \frac{375.32}{0.12 - 0.10} = ₹ 18766 \text{ Cr.}
 \end{aligned}$$

10%

## W.N.2 $\Delta$ WC

|             | 0    | 1    | 2    | 3    | 4       | T. YEAR |
|-------------|------|------|------|------|---------|---------|
| Revenue     | 2000 | 2400 | 2880 | 3456 | 4147.20 | 4561.92 |
| WC<br>@ 25% | 500  | 600  | 720  | 864  | 1036.80 | 1140.48 |
| $\Delta$ WC | -    | 100  | 120  | 144  | 172.80  | 103.68  |

## Value of firm (cr.)

| YEAR | CF    | PVF (13%) | PV.                   |
|------|-------|-----------|-----------------------|
| 1    | 56.00 | 0.885     | 49.56                 |
| 2    | 67.20 | 0.783     | 52.62                 |
| 3    | 80.64 | 0.693     | 55.88                 |
| 4    | 96.77 | 0.613     | 59.32                 |
| 4    | 18766 | 0.613     | 11503.56              |
|      |       | Vf        | <u>₹ 11720.94 cr.</u> |

### QUESTION – 16

Following information is available pertaining to ABC Ltd. which is expected to grow at a higher rate for 3 years after which growth rate will stabilize at a lower level.

Base year information is –

| Revenues    | EBIT<br>(After<br>Depreciation) ✓ | Capital<br>Expenditure | Depreciation |
|-------------|-----------------------------------|------------------------|--------------|
| ₹ 1,000 Cr. | ₹ 150 Cr.                         | ₹ 140 Cr.              | ₹ 100 Cr.    |

Information for high growth and stable growth period are as follows:

#### **Stable Growth**

| Particulars                                    | High Growth | Stable Growth                                  |
|--|-------------|--|
| Growth in Revenue & EBIT                       | 20%         | 10%  |
| Growth in Capital Expenditure and Depreciation | 20%         | Capital Expenditure are offset by Depreciation |
| Risk free rate                                 | 10%         | 9%   |
| Equity Beta                                    | 1.15        | 1.00   |
| Market Risk Premium                            | 6%          | 5%   |
| Pre Tax cost of Debt                           | 13%         | 12.86%   |
| Debt Equity Ratio                              | 1:1         | 2:3  |

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Working capital is 25% of Revenue for all time.

Corporate Tax Rate is 30%.

You are requested to find out the value of ABC Ltd.

(Exam May-2022)

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### QUESTION - 17

Following information is given in respect of WXY Ltd., which is expected to grow at a rate of 20% p.a. for the next three years, after which the growth rate will stabilize at 8% p.a. normal level, in perpetuity.

NET 150  
EBIT 2250

|  | <b>For the year ended<br/>March 31, 2014</b> |
|--|--|
| Revenues   | ₹ 7,500 Crores                               |
| Cost of Goods Sold (COGS)                        | ₹ 3,000 Crores                               |
| Operating Expenses                               | ₹ 2,250 Crores                               |
| Capital Expenditure                              | ₹ 750 Crores                                 |
| Depreciation<br>(included in Operating Expenses) | ₹ 600 Crores                                 |

During high growth period, revenues & Earnings before Interest & Tax (EBIT) will grow at 20% p.a. and capital expenditure net of depreciation will grow at 15% p.a. From year 4 onwards, i.e. normal growth period revenues and EBIT will grow at 8% p.a. and incremental capital expenditure will be offset by the depreciation. During both high growth & normal growth period, net working capital requirement will be 25% of revenues.

The Weighted Average Cost of Capital (WACC) of WXY Ltd. is 15%.

Corporate Income Tax rate will be 30%.

Required:

Estimate the value of WXY Ltd. using Free Cash Flows to Firm (FCFF) & WACC methodology.

The PVIF @ 15 % for the three years are as below:

| Year | t <sub>1</sub> | t <sub>2</sub> | t <sub>3</sub> |
|------|----------------|----------------|----------------|
| PVIF | 0.8696         | 0.7561         | 0.6575         |

(Study Material & PM)

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### QUESTION – 18

Mantra Ltd. is planning to buy Alay Ltd. Following information is given in respect of Alay Ltd. which is expected to grow at a rate of 18% p.a. for the next three years, after which the growth rate will stabilize at 8% p.a. normal level, in perpetuity:

| <b>Particulars</b>                           | <b>For the year ended<br/>March 31, 2022</b> |
|--|--|
| Revenues                                     | ₹ 6,800 Crores                               |
| Cost of Goods Sold (COGS)                    | ₹ 2,800 Crores                               |
| Operating Expenses                           | ₹ 2,100 Crores                               |
| Capital Expenditure                          | ₹ 750 Crores                                 |
| Depreciation<br>(included in Operating Exp.) | ₹ 600 Crores                                 |

During high growth period, Revenues & Earnings Before Interest & Tax (EBIT) will grow at 18% p.a. and capital expenditure net of depreciation will grow at 12% p.a. From 4<sup>th</sup> year onwards, i.e. normal growth period revenues and EBIT will grow at 8% p.a. and incremental capital expenditure will be offset by the depreciation. During both high growth

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& normal growth period, net working capital requirement will be 25% of revenues.

Corporate Income Tax rate is 30%.

The Weighted Average Cost of Capital (WACC) for both the companies is 15%.

You are required to estimate the value of Alay Ltd. using Free Cash Flows to Firm (FCFF) & WACC methodology.

The PVIF for the three years are as below:

| <b>Year</b> | <b>t1</b> | <b>t2</b> | <b>t3</b> |
|-------------|-----------|-----------|-----------|
| PVIF @ 15%  | 0.870     | 0.756     | 0.658     |

(Exam Nov-2022)

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### QUESTION - 32

ABC (India) Ltd., a market leader in printing industry, is planning to diversify into defense equipment businesses that have recently been partially opened up by the GOI for private sector. In the meanwhile, the CEO of the company wants to get his company valued by a leading consultants, as he is not satisfied with the current market price of his scrip.

He approached consultant with a request to take up valuation of his company with the following data for the year ended 2009:

|                              |                |
|------------------------------|----------------|
| Share Price                  | ₹ 66 per share |
| Outstanding debt             | 1934 lakh      |
| Number of outstanding shares | 75 lakh        |
| Net income (PAT)             | 17.2 lakh      |
| EBIT                         | 245 lakh       |
| Interest expenses            | 218.125 lakh   |
| Capital expenditure          | 234.4 lakh     |

### 1 WACC

$$K_e = 16\%$$

$$K_d = I(1-t)$$

$$I = \frac{218.125}{1934} \times 100 = 11.28\%$$

### Tax Rate

$$\text{EBIT} = 245$$

$$(-) \text{INT} = 218.125$$

$$\text{EBT} = \underline{26.875}$$

$$\text{Tax} = \frac{26.875 - 17.20}{26.875} \times 100 = 36\%$$

$$K_d = 11.28(1-0.36) = 7.22\%$$

|                                    |                                     |
|------------------------------------|-------------------------------------|
| Depreciation                       | 234.4 lakh                          |
| Working capital                    | 44 lakh                             |
| Growth rate 8% (from 2010 to 2014) |                                     |
| Growth rate 6% (beyond 2014)       |                                     |
| Free cash flow                     | 240.336 lakh<br>(year 2014 onwards) |

The capital expenditure is expected to be equally offset by depreciation in future and the debt is expected to decline by 30% in 2014.

Required:

Estimate the value of the company and ascertain whether the ruling market price is undervalued as felt by the CEO based on the foregoing data. Assume that the cost of equity is 16%, and 30% of debt repayment is made in the year 2014.

(Practice Manual)

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$$\begin{aligned}
 \text{Equity } (\text{₹}66 \times 754) &= \text{₹}4950 \text{ Lakhs} \\
 \text{Debt} &= \text{₹}1934 \text{ Lakh} \\
 &= \underline{\underline{6884 \text{ Lakh}}}
 \end{aligned}$$

$$\begin{aligned}
 K_0 &= \frac{(16 \times 4950) + (7.22 \times 1934)}{6884} \\
 &= 13.53\%
 \end{aligned}$$

## FCFF

(₹ in Lacs)

|                                   | 2010    | 2011    | 2012    | 2013    | 2014     |
|-----------------------------------|---------|---------|---------|---------|----------|
| EBIT(1-t)(156.80)                 | 169.344 | 182.892 | 197.523 | 213.325 | 230.391  |
| Change in WC<br>(W.N.2)           | 3.52    | 3.802   | 4.106   | 4.434   | 4.788    |
| Repayment of debt<br>(1934 x 30%) | -       | -       | -       | -       | 580.20   |
| FCFF                              | 165.824 | 179.09  | 193.417 | 208.891 | -354.597 |
| PVF (13.53%)                      | 0.881   | 0.776   | 0.683   | 0.602   | 0.530    |

$$PVCI = ₹ 354.99 \text{ Lakh}$$

## W.N.2 Working Capital

|             | 2009 | 2010  | 2011   | 2012   | 2013   | 2014   |
|-------------|------|-------|--------|--------|--------|--------|
| WC          | 44   | 47.52 | 51.322 | 55.427 | 59.862 | 64.650 |
| $\Delta$ WC | -    | 3.52  | 3.802  | 4.106  | 4.434  | 4.788  |

## WACC after 2014

$$E = (66 \times 75) = 4950$$

$$D = (1934 \times 70\%) = \frac{1353.80}{6303.80}$$

$$K_0 = \frac{(16 \times 4950) + (7.22 \times 1353.80)}{6303.80}$$

$$= 14.11\%$$

$$TV_5 = \frac{FCFF_6}{K_0 - g} = \frac{240.336}{0.1411 - 0.06} = ₹ 2963.452$$

$$V_F = ₹ 354.99 + (2963.452 \times 0.530) \\ = ₹ 1925.620 \text{ Lakhs}$$

$$V_E = V_F - V_D \\ = ₹ 1925.620 - (1934 \times 70\%) \\ = ₹ 571.82$$

$$\text{Value per share} = \frac{₹ 571.82}{75} \\ = ₹ 7.624 \text{ Overpriced}$$

### QUESTION - 34

Calculate the value of share from the following information:

|   |                  |
|---|------------------|
| Profit after tax of the company             | ₹ 290 crores     |
| Equity capital of company                   | ₹ 1,300 crores   |
| Par value of share                          | ₹ 40 each        |
| Debt ratio of company (Debt/ Debt + Equity) | 27%              |
| Long run growth rate of the company         | 8%               |
| Beta 0.1; risk free interest rate           | 8.7%             |
| Market returns                              | 10.3%            |
| Capital expenditure per share               | ₹ 47             |
| Depreciation per share                      | ₹ 39             |
| Change in Working capital                   | ₹ 3.45 per share |

(RTP May - 2020)

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### Value per share

$$\text{No. of shares} = \frac{1300 \text{ cr.}}{40} = 32.50 \text{ cr.}$$

$$\text{EPS} = \frac{290 \text{ cr.}}{32.50 \text{ cr.}} = ₹ 8.923$$

### FCFE per share

$$\text{EPS} \quad ₹ 8.923$$

$$\begin{aligned} \text{(-) Net Capex} & \\ [47 - 39] (1 - 0.27) & \quad ₹ 5.84 \end{aligned}$$

$$\begin{aligned} \text{(+) } \Delta \text{WC } 3.45 (1 - 0.27) & \quad ₹ 2.5185 \\ \hline \text{FCFE per share} & \quad \underline{₹ 0.5695} \end{aligned}$$

$$\begin{aligned}K_e &= R_f + (R_m - R_f)\beta \\ &= 8.70 + (10.3 - 8.70)0.1 \\ &= 8.86\%\end{aligned}$$

$$P_0 = \frac{FCFE_1}{K_e - g}$$

$$= \frac{0.5645(1.08)}{0.0886 - 0.08}$$

$$= 270.89$$

### QUESTION – 35

Calculate the value of share from the following information:

|                                     |                  |
|-------------------------------------|------------------|
| Profit of the Company (After Tax)   | ₹ 560 crores     |
| Equity share capital of the Company | ₹ 1,900 crores   |
| Par value of share                  | ₹ 50 each        |
| Debt ratio (Debt/Debt + Equity)     | 43%              |
| Long run growth rate of the Company | 7%               |
| Beta 0.1 (Risk free Interest rate)  | 9.5%             |
| Market return                       | 12.6%            |
| Capital expenditure per share       | ₹ 53             |
| Depreciation per share              | ₹ 45             |
| Increase in working capital         | ₹ 4.62 per share |

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(Exam May-2022)

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### QUESTION - 12

The valuation of Hansel Limited has been done by an investment analyst. Based on an expected free cash flow of ₹ 54 lakhs for the following year and an expected growth rate of 9 percent, the analyst has estimated the value of Hansel Limited to be ₹ 1800 lakhs. However, he committed a mistake of using the book values of debt and equity.

The book value weights employed by the analyst are not known, but you know that Hansel Limited has a cost of equity of 20 percent and post tax cost of debt of 10 percent. The value of equity is thrice its book value, whereas the market value of its debt is nine-tenths of its book value. What is the correct value of Hansel Ltd ?

(Study Material & PM)

(Page No. 17)

### • Existing Cost of Capital ( $K_0$ )

$$V_F = \frac{FCFF_1}{K_0 - g}$$

$$1800 = \frac{54}{K_0 - 0.09}$$

$$K_0 - 0.09 = \frac{54}{1800}$$

$$K_0 = 0.03 + 0.09 = 0.12 \text{ i.e. } 12\%$$

$$(20 \times w_A) + 10(1 - w_A) = 12$$

$$20w_A + 10 - 10w_A = 12$$

$$10w_A = 2$$

$$w_A = \frac{2}{10} = 0.2 \quad w_B = 0.8$$

$$\text{B.V. Weights} = w_E = 0.2 \quad w_D = 0.8$$

## Market Value Weights

$$\text{Market Value of Equity (0.2} \times 3 \text{ times)} = 0.60$$

$$\text{Market Value of debt (0.8} \times \frac{9}{10}) = 0.72$$

$$K_0 = \frac{(20 \times 0.60) + (10 \times 0.72)}{1.32} = 14.545\%$$

or

$$W_E = \frac{0.60}{1.32} = 0.454 \quad W_D = \frac{0.72}{1.32} = 0.545$$

$$K_0 = (20 \times 0.454) + (10 \times 0.545) = 14.545\%$$

## Correct Value of firm

$$V_F = \frac{54}{0.1454 - 0.09}$$
$$= ₹ 974.73 \text{ lakhs}$$

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### **QUESTION – 13**

An established company is going to be de merged in two separate entities. The valuation of the company is done by a well-known analyst. He has estimated a value of ₹ 5,000 lakhs, based on the expected free cash flow for next year of ₹ 200 lakhs and an expected growth rate of 5%. While going through the valuation procedure, it was found that the analyst has made the mistake of using the book values of debt and equity in his calculation. While you do not know the book value weights he used, you have been provided with the following information:

- (i) The market value of equity is 4 times the book value of equity, while the market value of debt is equal to the book value of debt,
- (ii) Company has a cost of equity of 12%,
- (iii) After tax cost of debt is 6%.

You are required to advise the correct value of the company.

### QUESTION – 14

A valuation done of an established company by a well-known analyst has estimated a value of ₹ 500 lakhs, based on the expected free cash flow for next year of ₹ 20 lakhs and an expected growth rate of 5%.

While going through the valuation procedure, you found that the analyst has made the mistake of using the book values of debt and equity in his calculation. While you do not know the book value weights he used, you have been provided with the following information:

- (i) Company has a cost of equity of 12%,
- (ii) After tax cost of debt is 6%,
- (iii) The market value of equity is three times the book value of equity, while the market value of debt is equal to the book value of debt.

You are required to estimate the correct value of the company.

(RTP May – 2020)

(Page No. 19)

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### QUESTION - 25

T Ltd. Recently made a profit of ₹ 50 crore and paid out ₹ 40 crore (slightly higher than the average paid in the industry to which it pertains). The average PE ratio of this industry is 9. As per Balance Sheet of T Ltd., the shareholder's fund is ₹ 225 crore and number of shares is 10 crore. In case company is liquidated, building would fetch ₹ 100 crore more than book value and stock would realize ₹ 25 crore less.

The other data for the industry is as follows:

Projected Dividend Growth

4%

Risk Free Rate of Return

6%

Market Rate of Return

11%

Average Dividend Yield

6%

The estimated beta of T Ltd. is 1.2. You are required to calculate value of T Ltd. using

PAT 50cr.

Dividend 40cr.

$$P/E = 9$$

$$NW = 225cr. (BV)$$

$$\begin{array}{r} \text{Real } 225 \\ + 100 \\ - 25 \\ \hline 300 \text{ cr} \end{array}$$

(i) P/E Ratio  $50 \times 9 = 450 \text{cr.}$

(ii) Dividend Yield  $40/6\% = 666.66\%$

(iii) Valuation as per:

(a) Dividend Growth Model  $520 \text{cr.}$

(b) Book Value  $225 \text{cr.}$

(c) Net Realizable Value  $300 \text{cr.}$

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$$\frac{40(1.04)}{0.12 - 0.04}$$

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## **QUESTION – 22**

Sun Ltd. recently made a profit of ₹ 200 crore and paid out ₹ 80 crore (slightly higher than the average paid in the industry to which it pertains). The average PE ratio of this industry is 9. The estimated beta of Sun Ltd. is 1.2. As per Balance Sheet of Sun Ltd., the shareholder's fund is ₹ 450 crore and number of shares is 10 crore. In case the company is liquidated, building would fetch ₹ 200 crore more than book value and stock would realize ₹ 50 crore less.

The other data for the industry is as follows:

|                           |     |
|---------------------------|-----|
| Projected Dividend Growth | 4%  |
| Risk Free Rate of Return  | 6%  |
| Market Rate of Return     | 11% |

Calculate the valuation of Sun Ltd. using

- (a) P/E Ratio
- (b) Dividend Growth Model
- (c) Book Value
- (d) Net Realizable Value

(RTP May – 2021)  
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### QUESTION - 23

ABC Co. is considering a new sales strategy that will be valid for the next 4 years. They want to know the value of the new strategy Following information relating to the year which has just ended, is available:

| <b>Income Statement</b>                              | <b>₹</b>     |
|--|--------------|
| Sales  | 20,000       |
| Gross margin (20%)                                   | 4,000        |
| Administration, Selling & distribution expense (10%) | 2,000        |
| <b>EBIT</b> PBT                                      | <u>2,000</u> |
| Tax (30%)  | 600          |
| <b>NOPAT</b> PAT                                     | <u>1,400</u> |
| <b><u>Balance Sheet Information</u></b>              |              |
| Fixed Assets   | 8,000        |
| Current Assets                                       | 4,000        |

|        |        |
|--------|--------|
| Equity | 12,000 |
|--------|--------|

If it adopts the new strategy, sales will grow at the rate of 20% per year for three years. From 4th year onward Cash Flow will be stabilized. The gross margin ratio, Assets turnover ratio, the Capital structure and the income tax rate will remain unchanged.

Depreciation would be at 10% of net fixed assets at the beginning of the year.

The Company's target rate of return is 15%.

Determine the incremental value due to adoption of the strategy.

(Study Material, PM & RTP May - 2020)

(Page No. 33)

### QUESTION - 23

ABC Co. is considering a new sales strategy that will be valid for the next 4 years. They want to know the value of the new strategy. Following information relating to the year which has just ended, is available:

| Income Statement                                     | ₹      |
|--|--------|
| Sales  | 20,000 |
| Gross margin (20%)                                   | 4,000  |
| Administration, Selling & distribution expense (10%) | 2,000  |
| <b>PBT</b>   | 2,000  |
| Tax (30%)  | 600    |
| <b>PAT</b>   | 1,400  |
| Balance Sheet Information                            |        |
| Fixed Assets   | 8,000  |
| Current Assets                                       | 4,000  |

### 1. Pre strategy Value of Business

$$V_B = \frac{PAT}{k_0} = \frac{1400}{15\%} = ₹9333$$

### 2. Post strategy Value of Business

|                    | 1     | 2     | 3     | 4     |
|--------------------|-------|-------|-------|-------|
| Fixed Asset (8000) | 9600  | 11520 | 13824 | 13824 |
| CA (4000)          | 4800  | 5760  | 6912  | 6912  |
|                    | 14400 | 17280 | 20736 | 20736 |
| Equity (12000)     | 14400 | 17280 | 20736 | 20736 |

## Calculation of FCFF

|              | 1    | 2    | 3        | 4       |
|--------------|------|------|----------|---------|
| NOPAT (1400) | 1680 | 2016 | 2419.20  | 2419.20 |
| (+) Dep.     | 800  | 960  | 1152     | 1382.40 |
| (-) FA       | 2400 | 2880 | 3456     | 1382.40 |
| (-) CA       | 800  | 960  | 1152     | —       |
| FCFF         | -720 | -864 | -1036.80 | 2419.20 |

$$TV_3 = \frac{FCFF_4}{k_0} = \frac{2419.20}{15\%} = ₹ 16128$$

$$\begin{aligned} \text{Cost Strategy)} &= (-720 \times 0.870) + (-864 \times 0.756) \\ &+ (-1036.80 \times 0.658) + (16128 \times 0.658) \\ &= ₹ 8650.42 \end{aligned}$$

$$\begin{aligned} \text{Value of strategy} &= 8650.42 - 9333.33 \\ &= (\text{₹ } 682.91) \end{aligned}$$

### QUESTION - 24

(a) Following details are available for X Ltd.

Income Statement for the year ended 31<sup>st</sup> March, 2018

| Particulars             | Amount |
|-------------------------|--------|
| Sales                   | 40,000 |
| Gross Profit            | 12,000 |
| Administrative Expenses | 6,000  |
| Profit Before tax       | 6,000  |
| Tax @ 30%               | 1,800  |
| Profit After Tax        | 4,200  |

Balance sheet as on 31<sup>st</sup> March, 2018

| Particulars          | Amount |
|----------------------|--------|
| Fixed Assets         | 10,000 |
| Current Assets       | 6,000  |
| Total Assets         | 16,000 |
| Equity Share Capital | 15,000 |
| → Sundry Creditors   | 1,000  |
| Total Liabilities    | 16,000 |

The Company is contemplating for new sales strategy as follows :



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- (i) Sales to grow at 30% per year for next four years.
- (ii) Assets turnover ratio, net profit ratio and tax rate will remain the same.
- (iii) Depreciation will be 15% of value of net fixed assets at the beginning of the year.
- (iv) Required rate of return for the company is 15%

Evaluate the viability of new strategy

(Exam November – 2018)

(Page No. 36)

### QUESTION - 19

Eagle Ltd. reported a profit of ₹ 77 lakhs after 30% tax for the financial year 2011-12. An analysis of the accounts revealed that the income included extraordinary items of ₹ 8 lakhs and an extraordinary loss of ₹10 lakhs. The existing operations, except for the extraordinary items, are expected to continue in the future. In addition, the results of the launch of a new product are expected to be as follows:

|               | ₹ In <u>Lakhs</u> |
|---------------|-------------------|
| Sales         | 70                |
| Material Cost | 20                |
| Labour Cost   | 12                |
| Fixed Cost    | 10                |

held

28 PBT

You are required to:

- (i) Calculate the value of the business, given that the capitalization rate is 14%.

## (i) Value of Business

### Income Statement

Existing Business

$$PBT = \frac{77}{(1-0.30)} = ₹110$$

(-) Extraordinary Income = ₹8

(+) Extraordinary Loss = ₹10

PBT

New product

(70 - 42)

Total PBT

(-) Tax @ 30%  
FMP

|      |
|------|
| ₹112 |
| ₹28  |
| ₹140 |
| 42   |
| ₹98  |

$$V_B = \frac{98}{14\%}$$

$$= ₹700 \text{ lakh}$$

(ii) Determine the market price per equity share, with Eagle Ltd.'s share capital being comprised of 1,00,000 13% preference shares of ₹ 100 each and 50,00,000 equity shares of ₹ 10 each and the P/E ratio being 10 times.

(Study Material & PM)

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## (ii) Market price

|  |           |
|--|-----------|
| PAT                                      | ₹ 9800000 |
| (-) Pref. dividend<br>(₹ 10000000 × 13%) | ₹ 1300000 |
| Earnings                                 | ₹ 8500000 |
| ÷ No. of Equity                          | 5000000   |
| EPS                                      | 1.70      |
| (X) P/E                                  | 10        |
| m.p.s                                    | ₹ 17      |

### QUESTION - 20

Excellent Ltd. reported a profit of ₹ 154 lakhs after 30% tax for the financial year 2019- 20. An analysis of the accounts revealed that there is an extraordinary loss of ₹ 20 lakhs and the income included extraordinary items of ₹ 16 lakhs. The existing operations, except for the extraordinary items, are expected to continue in the future. In addition, the results of the launch of a new product are expected to be as follows:

|                | ₹ in lakhs |
|----------------|------------|
| Sales          | 140        |
| Material costs | 40         |
| Labour costs   | 24         |
| Fixed costs    | 20         |

You are required to:

- (i) Calculate the value of the business, given that the capitalization rate is 14%.



H.W  
H.W  
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(ii) Determine the market price per equity share, with Excellent Ltd.'s share capital being comprised of 2,00,000 at 13% preference shares of ₹ 100 each and 10,00,000 equity shares of ₹ 10 each and the P/E ratio being 12 times. (Ignoring Corporate Dividend Tax).

(Exam July – 2021)

(Page No. 30)

### QUESTION - 21

The closing price of LX Ltd. is ₹ 24 per share as on 31st March, 2019 on NSE Ltd. The Price Earnings Ratio was 6. It was found that an amount of ₹ 24 Lakhs as income and an extraordinary loss of ₹ 9 lakhs were included in the books of accounts. The existing operations except for the extraordinary items are expected to continue in future. Further the company has launched a new product during the year with the following expectations:

|               | (₹ in Lakhs) |
|---------------|--------------|
| Sales         | 150          |
| Material Cost | 40           |
| Labour Cost   | 34           |
| Fixed Cost    | 24           |

The company has 500,000 equity shares of ₹ 10 each and 100,000 9% Preference Shares of ₹ 100 each. The Price Earnings Ratio is 6 times. Post tax cost of capital is 10 per cent per annum. Tax

H.W  
H.W  
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rate is 34 per cent. You are required to determine:

- (i) Existing Profit from old operations
- (ii) The value of business

(Exam May – 2019)

(Page No. 31)

# Comparative Valuation Method

Cement



944

Asset  $450 \times 1.771 = 796.95$

Sales  $800 \times 0.441 = 352.80$

576.875 L



844

M.V. = ₹ 500L

Asset = ₹ 300L

1.667

Sales = 1200L



844

M.V. = 650L

Asset = 350L

1.875

Sales = 1400L

M.V to Sales  
0.417

0.464

0.441

### QUESTION - 26

XY Ltd., a Cement manufacturing Company has hired you as a financial consultant of the company. The Cement Industry has been very stable for some time and the cement companies SK Ltd. & AS Ltd. are similar in size and have similar product market mix characteristic. Use comparable method to value the equity of XY Ltd. In performing analysis, use the following ratios:

- (i) Market to book value
- (ii) Market to replacement cost
- (iii) Market to sales
- (iv) Market to Net Income

The following data are available for your analysis:

(Amount in ₹)

|                  | <b>SK Ltd</b> | <b>AS Ltd.</b> | <b>XY Ltd.</b> |
|------------------|---------------|----------------|----------------|
| Market Value ✓   | 450           | 400            |                |
| Book Value ✓     | 400           | 300            | 250            |
| Replacement Cost | 600           | 550            | 500            |
| Sales            | 550           | 450            | 500            |
| Net Income       | 18            | 16             | 14             |

(Exam November - 2019)

(Page No. 39)

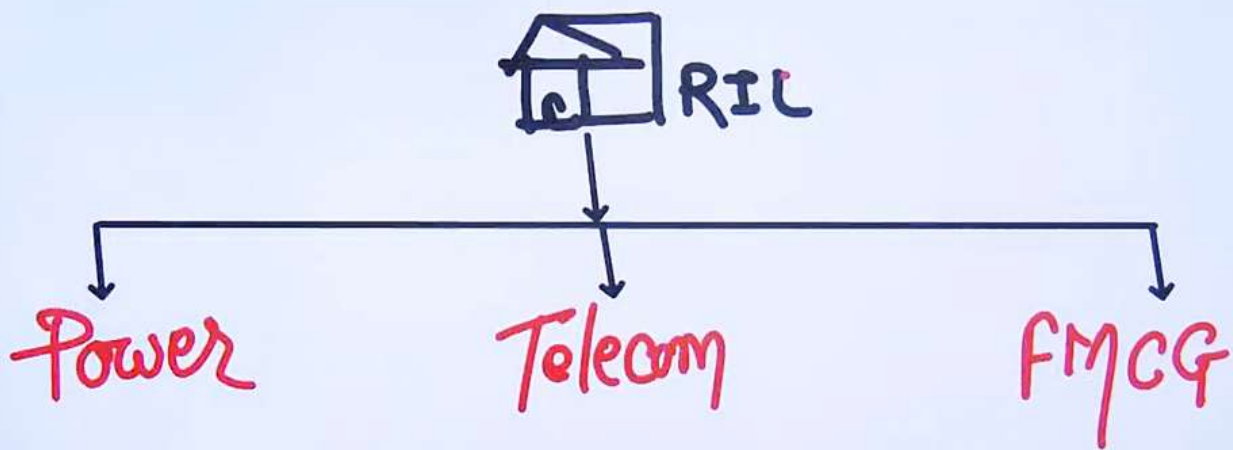
## Calculation of Ratio

| Ratio             | SK 49 | AS 49 | Avg   |
|-------------------|-------|-------|-------|
| Market to B.V.    | 1.125 | 1.333 | 1.229 |
| Market to Replace | 0.75  | 0.727 | 0.739 |
| Market to Sales   | 0.818 | 0.889 | 0.854 |
| Market to NI      | 25    | 25    | 25    |

## Value of XY 49

| Basis       | Amb | Ratio      | Amb x Ratio       |
|-------------|-----|------------|-------------------|
| Book Value  | 250 | 1.229      | 307.25            |
| Replacement | 500 | 0.739      | 369.50            |
| Sales       | 500 | 0.854      | 427               |
| NI          | 14  | 25         | 350               |
|             |     | $\sqrt{B}$ | <u>363.44</u> 194 |

# Chop-Shop Approach (Breakup Value Approach)



### **QUESTION – 36**

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

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

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



| <b>Business Segment</b> | <b>Capitalization/Sales</b> | <b>Capitalization/Assets</b> | <b>Capitalization/Operating Income</b> |
|-------------------------|-----------------------------|------------------------------|--|
| Wholesale               | 0.85                        | 0.7                          | 9                                      |
| Retail                  | 1.2                         | 0.7                          | 8                                      |
| General                 | 0.8                         | 0.7                          | 4                                      |

(Practice Manual)

(Page No. 59)

## on the basis of Sales

| Segment | Sales    | Ratio | Sales × ratio    |
|---------|----------|-------|------------------|
| W       | € 225000 | 0.85  | 191250           |
| R       | € 720000 | 1.20  | 864000           |
| G       | € 250000 | 0.8   | 200000           |
|         |          | VB    | <u>€ 3055250</u> |

(HW)



### QUESTION - 41

Given below is the Balance Sheet of S Ltd. as on 31.3.2008:

| Liabilities                      | ₹ (in lakh) | Assets              | ₹ (in lakh) |
|----------------------------------|-------------|---------------------|-------------|
| Share capital<br>(share of ₹ 10) | 100         | Land and building   | 40          |
| Reserves and surplus             | 40          | Plant and machinery | 80          |
| Long Term Debts                  | 30          | Investments         | 10          |
|                                  |             | Stock               | 20          |
|                                  |             | Debtors             | 15          |
|                                  |             | Cash at bank        | 5           |
|                                  | <u>170</u>  |                     | <u>170</u>  |

You are required to work out the value of the Company's, shares on the basis of Net Assets method and Profit-earning capacity (capitalization) method and arrive at the fair price of the shares, by considering the following information:

- (i) Profit for the current year ₹ 64 lakhs includes ₹ 4 lakhs extraordinary income and ₹ 1 lakh income from investments of surplus funds; such surplus funds are unlikely to recur.

### 1 Net Assets Method

|                        |                  |
|------------------------|------------------|
| L & B                  | 96               |
| P & M                  | 100              |
| Investments            | 10               |
| Stock                  | 20               |
| Debtors                | 15               |
| Cash                   | 5                |
| (-) Debt               | 30               |
|                        | <u>216 Lakhs</u> |
| Net Asset              |                  |
| ÷ No. of Equity shares | 10               |
| Value per share        | ₹ 21.60          |

(ii) In subsequent years, additional advertisement expenses of ₹ 5 lakhs are expected to be incurred each year.

(iii) Market value of Land and Building and Plant and Machinery have been ascertained at ₹ 96 lakhs and ₹ 100 lakhs respectively. This will entail additional depreciation of ₹ 6 lakhs each year.

(iv) Effective Income-tax rate is 30%.

(v) The capitalization rate applicable to similar businesses is 15%.

(Practice Manual)

(Page No. 69)

It is assumed that given profit is PBT

## 2. Profit Earnings Capacity

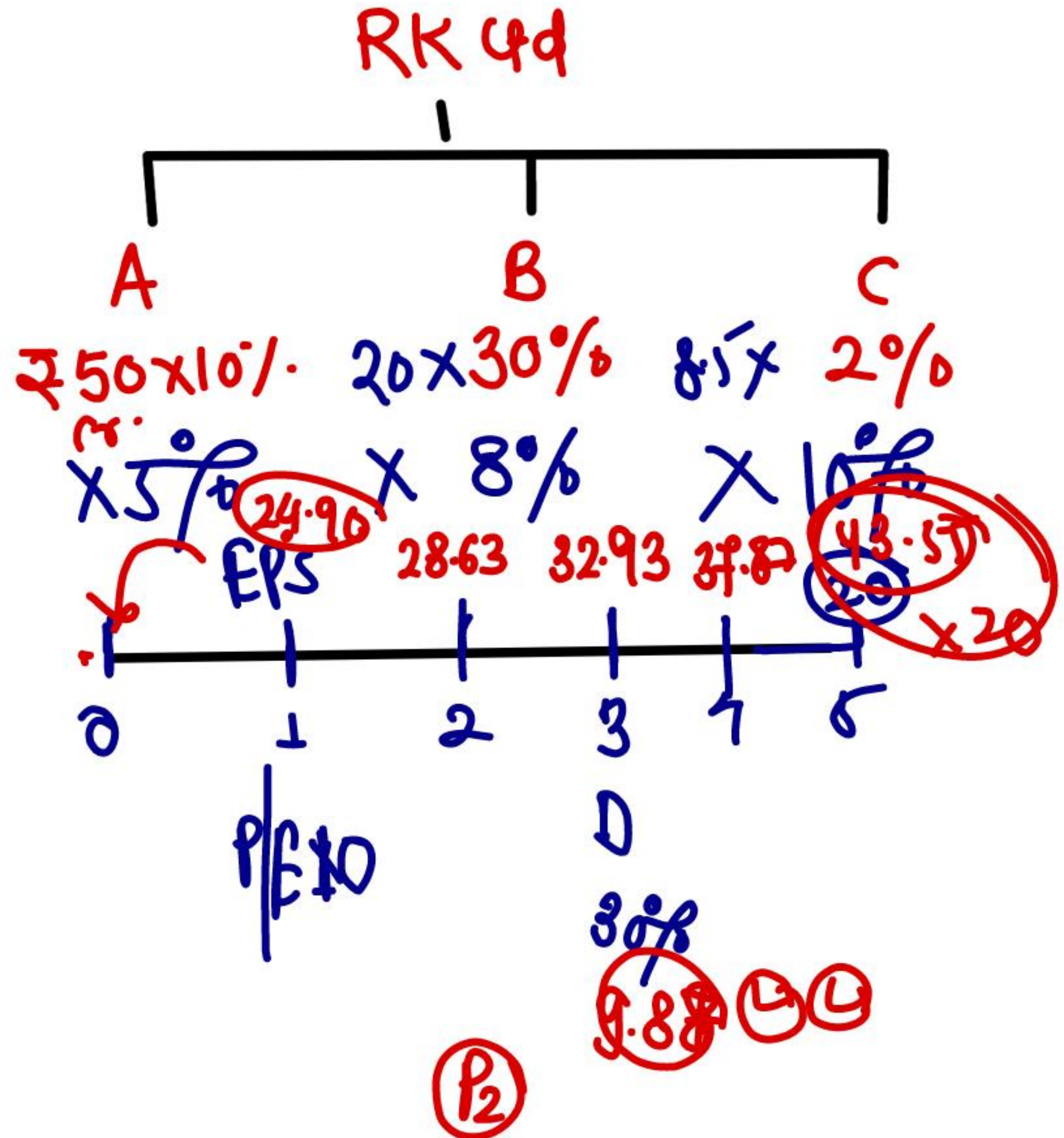
|                              |       |         |
|------------------------------|-------|---------|
| PBT                          | ₹ 64  |         |
| (-) Extra. Income            | 4     |         |
| (-) Income from Investment   | 1     |         |
| (-) Advertisement Exp.       | 5     |         |
| (-) Dep.                     | 6     |         |
|                              | 48    |         |
| FMP before Tax               | 48    |         |
| (-) Tax @ 30%                | 14.40 |         |
|                              | 33.60 |         |
| FMP                          | 33.60 |         |
| $V_f = \frac{33.60}{15\%} =$ | 224   |         |
| (-) VD                       | 30    |         |
|                              | 194   |         |
| VE                           | 194   |         |
| ÷ No. of Equity              | 10    | ₹ 19.40 |

$$\text{Fair Value} = \frac{21.60 + 19.40}{2} = ₹ 20.50$$

### QUESTION - 27

You are interested in buying some equity stocks of RK Ltd. The company has 3 divisions operating in different industries. Division A captures 10% of its industries sales which is forecasted to be ₹ 50 crore for the industry. Division B and C captures 30% and 2% of their respective industry's sales, which are expected to be ₹ 20 crore and ₹ 8.5 crore respectively. Division A traditionally had a 5% net income margin, whereas divisions B and C had 8% and 10% net income margin respectively. RK Ltd. has 3,00,000 shares of equity stock outstanding, which sell at ₹ 250.

The company has not paid dividend since it started its business 10 years ago. However from the market sources you come to know that RK Ltd. will start paying dividend in 3 years time and the pay-out ratio is 30%. Expecting this dividend, you would like to hold the stock for 5 year. By analyzing the past financial statements, you have determined that RK Ltd.'s required rate of return is 18% and that P/E ratio of 10 for the next year and on ending P/E ratio of 20 at the end of the fifth year are appropriate.



Required:

- (i) Would you purchase RK Ltd. equity at this time based on your one year forecast?
- (ii) If you expect earnings to grow @ 15% continuously, how much are you willing to pay for the stock of RK Ltd ?

Ignore taxation.

PV factors are given below :

| Years     | 1     | 2     | 3     | 4     | 5     |
|-----------|-------|-------|-------|-------|-------|
| PVIF@ 18% | 0.847 | 0.718 | 0.609 | 0.516 | 0.437 |

(Exam November - 2019 & MTP March - 2021)

(Page No. 40)

Share is overpriced, hence it should not be purchased.

## Estimated EPS

|                                      | Net Income |
|--------------------------------------|------------|
| A (50 cr. $\times$ 10% $\times$ 5%)  | ₹ 2500000  |
| B (20 cr. $\times$ 30% $\times$ 8%)  | ₹ 4800000  |
| C (8.5 cr. $\times$ 2% $\times$ 10%) | ₹ 1700000  |
|                                      | <hr/>      |
| Estimated Earnings                   | ₹ 7470000  |
| $\div$ No. of Equity shares          | 300000     |
|                                      | ₹ 24.90    |

EPS<sub>1</sub>

$$\begin{aligned} \text{Price} &= \text{EPS} \times \text{P/E} \\ &= 24.90 \times 10 = ₹ 249 \end{aligned}$$

$$P_0 = (249 \times 0.847) = ₹ 210.90$$

11

271.91

$$P_2 = \frac{11.361}{0.18 - 0.15} = 378.70 \times 0.718$$

EPS = 24.90

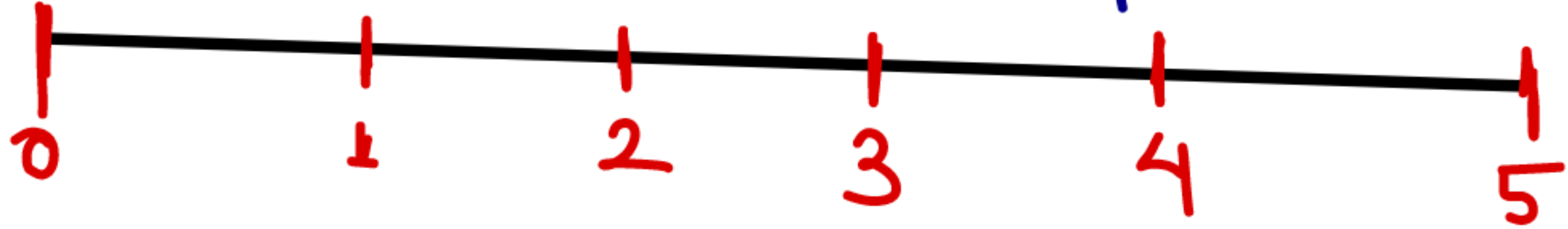
28.635

32.930

37.870

43.550

50.082



30%

$$\frac{11.361}{0.609}$$

$$13.065 \times 0.516$$

$$15.025 \times 0.437$$

$P_0 = ₹ 271.92$   
 Share is underpriced,  
 Buy.

$$P_5 = \frac{15.025(1.15)}{0.18 - 0.15}$$

$$B_A = B_E \times \frac{E}{E+D}$$

$$2 = B_E \times \frac{300000}{300000 + 200000}$$

$$2 = 0.6 B_E$$

$$B_E = \frac{2}{0.6} =$$

### Example - 06

Equity = 3,00,000

Debt = 2,00,000

Assets beta or overall beta = 2

Stock beta or equity beta ?

## Beta of Equity

$$B_A = B_E \times \frac{E}{E+D}$$

$$1.50 = B_E \times \frac{3}{3+2}$$

$$B_E = 2.50$$

## Cost of Equity

$$K_e = R_f + (R_M - R_f) B_E$$
$$= 6 + (10 - 6) 2.50 = 16\%$$

$$K_d = 6\%$$

$$K_0 = \frac{(16 \times 3) + (6 \times 2)}{5} = 12\%$$

## Example - 07

$$\frac{FCFF_1}{K_0} = ₹ 4,00,000 \text{ p.a. } \underline{\text{perpetual}}$$

$$D/E = 2:3$$

$$\text{Assets beta} = 1.50$$

$$R_f \checkmark = 6\%$$

$$R_M \checkmark = 10\%$$

Calculate value of firm.

If question is silent  
then  $R_f = K_d$

$$V_f = \frac{FCFF_1}{K_0} = \frac{400000}{12\%}$$
$$= ₹ 3333333$$

Asset of Beta of Two  
Similar firm shall be same

Hence Use  $B_A$  of B Ltd i.e. 0.9

Equity Beta of A Ltd

$$B_A = B_E \times \frac{E}{E+D}$$

$$0.9 = B_E \times \frac{4}{4+1}$$

$$B_E = 1.125$$

$$K_e = 5 + (12 - 5) \times 1.125 = 12.875\%$$

$$K_d = 5\%$$

Example - 08

A Ltd. is an Electronic firm

$$D/E = 1:4$$

$$FCFF_1 = ₹ 2,50,000$$

$$R_f = 5\%$$

$$R_M = 12\%$$

$B_E$

$K_e$

$K_d$   $K_0$

Calculate Value of A Ltd.

- Assets beta of another electronic firm B Ltd. is 0.9

(Page No. 6)

$$K_0 = \frac{(12.875 \times 4) + (5 \times 1)}{5}$$

$$= 11.30\%$$

$$V_f = \frac{250000}{11.30\%} = ₹ 2212389$$

BA of B Ltd

$$\begin{aligned} BA &= BE \times \frac{E}{E+D} \\ &= 1.75 \times \frac{4}{4+1} \\ &= 1.40 \end{aligned}$$

Use BA of B Ltd in A Ltd Valuation

BE of A Ltd

$$\begin{aligned} 1.40 &= BE \times \frac{3}{3+1} \\ BE &= 1.867 \\ K_e &= 7 + (13-7)1.867 = 18.20\% \\ K_d &= 7\% \end{aligned}$$

Example - 09

A Ltd is an electronic firm

FCFF<sub>1</sub> = 1,75,000

R<sub>F</sub> = 7%

R<sub>M</sub> = 13%

D/E = 1:3

Calculate Value of A Ltd.

B Ltd. is similar electronic firm

BE = 1.75

D/E = 1:4

$K_0 = \frac{(18.20 \times 3) + (7 \times 1)}{4} = 15.4\%$

$V_f = \frac{175000}{15.4\%} = ₹ 1136364$

## Example - 10

$$D/E = 2:3$$

$$BA = 1.20$$

$$BD = 0.40$$

$$BE = ?$$

$$B_A = \left( B_E \times \frac{E}{E+D} \right) + \left( B_D \times \frac{D}{E+D} \right)$$

$$1.20 = \left( B_E \times \frac{3}{3+2} \right) + \left( 0.40 \times \frac{2}{3+2} \right)$$

$$1.20 = 0.6 B_E + 0.16$$

$$B_E = \frac{1.20 - 0.16}{0.6} = 1.733$$

$$\frac{BE}{BA} = \left( BE \times \frac{E}{E + D(1-t)} \right) + \left( BD \times \frac{D(1-t)}{E + D(1-t)} \right)$$

$$1.15 = \left( BE \times \frac{3}{3 + 2(1-0.30)} \right)$$

$$1.15 = BE \times \frac{3}{4.40}$$

$$BE = 1.687$$

$$K_e = 10 + (15-10)1.687 = 18.435\%$$

$$K_d = 10(1-0.30) = 7\%$$

### Example - 11

$$FCFF_1 = ₹ 80,000$$

$$BA = 1.15 \quad BE$$

$$D/E = 2:3$$

$$R_f = 10\%$$

$$R_M = 15\%$$

$$Tax = 30\%$$

Value of company = ?

$$K_0 = \frac{(18.435 \times 3) + (7 \times 2)}{5}$$

$$= 13.86\%$$

$$V_f = \frac{80000}{13.86\%} = 5772$$

### QUESTION - 37

The total market value of the equity share of O.R.E. company is ₹ 60,00,000 and the total value of the debts is ₹ 40,00,000. The treasure estimate that the beta of the stock is currently 1.5 and that the expected risk premium on the market is 10%. The treasury bill rate is 8%.

#### **Required:**

- (1) What is the beta of the company's existing portfolio of assets?
- (2) Estimate the company's cost of capital and the discount rate for an expansion of the company's business.

(Page No. 62)

If Company Expand same business with same Risk then Disc. Rate 17% should be used.

### ① Asset Beta

$$\begin{aligned} B_A &= B_E \times \frac{E}{E+D} \\ &= 1.5 \times \frac{6000000}{10000000} = 0.9 \end{aligned}$$

### ② Cost of Capital

$$\begin{aligned} K_e &= R_f + MRP \times B_E \\ &= 8 + 10 \times 1.5 = 23\% \\ K_d &= R_f = 8\% \\ WACC &= \frac{(6000000 \times 23) + (4000000 \times 8)}{10000000} \\ &= 17\% \end{aligned}$$

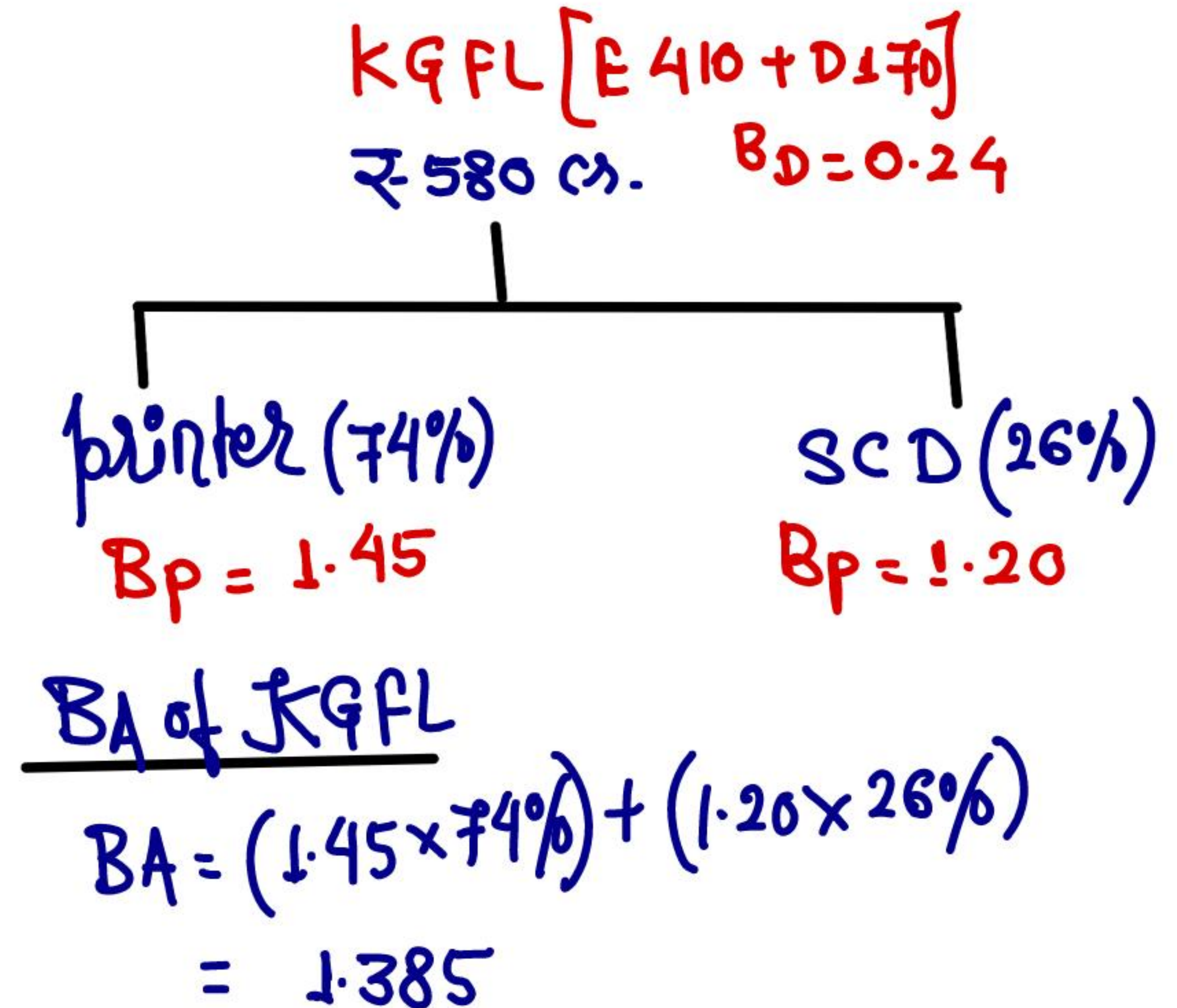
### QUESTION - 38

Equity of KGF Ltd. (KGFL) is ₹ 410 Crores, its debt, is worth ₹ 170 Crores. Printer Division segments value is attributable to 74%, which has an Asset Beta ( $\beta_p$ ) of 1.45, balance value is applied on Spares and Consumables Division, which has an Asset Beta ( $\beta_{sc}$ ) of 1.20 KGFL Debt beta ( $\beta_D$ ) is 0.24.

**You are required to calculate:**

- (i) Equity Beta ( $\beta_E$ ),
- (ii) Ascertain Equity Beta ( $\beta_E$ ), if KGF Ltd. decides to change its Debt Equity position by raising further debt and buying back of equity to have its Debt Equity Ratio at 1.90. Assume that the present Debt Beta ( $\beta_{D1}$ ) is 0.35 and any further funds raised by way of Debt will have a Beta ( $\beta_{D2}$ ) of 0.40.
- (iii) Whether the new Equity Beta ( $\beta_E$ ) justifies increase in the value of equity on account of leverage?

(Page No. 64)



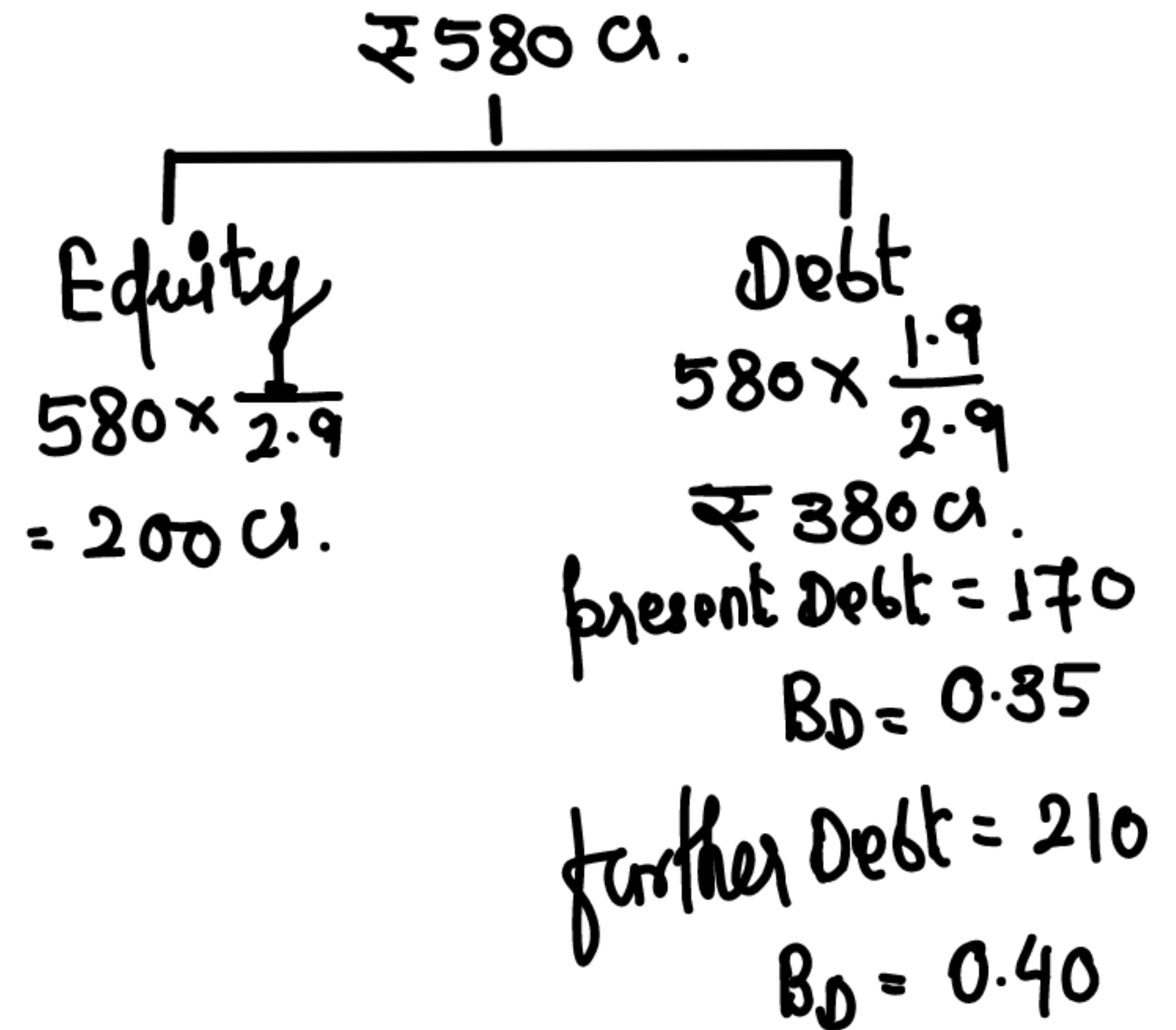
## ① Equity Beta of KGFL

$$B_A = \left( B_E \times \frac{E}{E+D} \right) + \left( B_D \times \frac{D}{E+D} \right)$$
$$1.385 = \left( B_E \times \frac{410}{580} \right) + \left( 0.24 \times \frac{170}{580} \right)$$

$$1.385 = 0.7069 B_E + 0.0703$$

$$B_E = \frac{1.385 - 0.0703}{0.7069}$$
$$= 1.86$$

## (ii) BE of KGFL



$$1.385 = \left( B_E \times \frac{200}{580} \right) + \left( 0.35 \times \frac{170}{580} \right) + \left( 0.40 \times \frac{210}{580} \right)$$

$$1.385 = 0.3448 B_E + 0.1026 + 0.1448$$

$$B_E = \frac{1.385 - 0.1026 - 0.1448}{0.3448} = 3.299$$

(iii) Since BE increased due to Increase in debt, hence Risk of Equity also increase

### QUESTION - 39

STR Ltd.'s current financial year's income statement reported its net income after tax as ₹ 50 Crore.

Following is the capital structure of STR Ltd. at the end of current financial year:

|   | ₹         |
|---|-----------|
| Debt (Coupon rate = 11%)                    | 80 Crore  |
| Equity (Share Capital + Reserves & Surplus) | 250 Crore |
| Invested Capital                            | 330 Crore |

Following data is given to estimate cost of equity capital:

|                             |      |
|-----------------------------|------|
| Asset Beta of TSR Ltd.      | 1.11 |
| Risk free rate of return    | 8.5% |
| Average market risk premium | 9%   |

The applicable corporate income tax rate is 30%.

Estimate Economic Value added (EVA) of RST Ltd. in ₹ lakh.

(RTP November - 2021 & MTP October - 2020)

(Page No. 66)

### 1 WACC

$$\beta_A = \beta_E \times \frac{E}{E + D(1-t)}$$

$$1.11 = \beta_E \times \frac{250}{250 + 80(1-0.30)}$$

$$1.11 = 0.8170 \beta_E$$

$$\beta_E = \frac{1.11}{0.8170} = 1.36$$

$$\begin{aligned} K_e &= R_f + MRP \beta_E \\ &= 8.5 + 9 \times 1.36 = 20.74\% \end{aligned}$$

$$K_d = I(1-t) = 11(1-0.30) = 7.70\%$$

$$WACC = \frac{(250 \times 20.74) + (80 \times 7.70)}{330} = 17.58\%$$

## 2. NOPAT

$$\begin{aligned} \text{EBIT} &= \frac{\text{PAT}}{(1-t)} + \text{Interest} \\ &= \frac{5000}{(1-0.30)} + 880 = ₹ 8022.857 \end{aligned}$$

$$\begin{aligned} \text{NOPAT} &= \text{EBIT}(1-t) \\ &= 8022.857(1-0.30) = ₹ 5616.00 \end{aligned}$$

## 3. EVA

$$\begin{aligned} \text{EVA} &= \text{NOPAT} - \text{Invested Capital} \times \text{WACC} \\ &= 5616 - 33000 \times 17.58\% \\ &= - ₹ 185.40 \text{ Cr.} \end{aligned}$$

Q40, Q33, Q30, Q28 Merger

Q29 Ratio