

## CHP - 1

## EQUITY ANALYSIS AND VALUATION

Years	May		Nov	
	RTP	Paper	RTP	Paper
2008	NA	NA	Yes	No
2009	Yes	Yes	Yes	Yes
2010	Yes	Yes	Yes	Yes
2011	Yes	Yes	Yes	Yes
2012	Yes	Yes	Yes	Yes
2013	No	Yes	Yes	Yes
2014	Yes	Yes	Yes	Yes
2015	Yes	No	Yes	Yes
2016	Yes	Yes	NA	NA
2016	Yes	Yes	No	Yes
2017	Yes	Yes	Yes	Yes
2018 (Old)	Yes	No	Yes	Yes
2018 (New)	Yes	Yes	Yes	Yes
2019(old)	Yes	Yes	NA	NA
2019 (New)	Yes	Yes	NA	NA

2008

**Question 1**

Nov 2008 RTP

The total market value of the equity share of Raheja Company is Rs.90,00,000 and the total value of the debt is Rs.60,00,000. The treasurer estimated that the beta of the stock is currently 1.9 and that the expected risk premium on the market is 12 per cent. The treasury bill rate is 9 per cent.

**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 present business.

**Solution :**

1) Beta of Company's existing Portfolio

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

$$\beta \text{ Liabilities} = W_t \beta \text{ Equity} + w_t \beta \text{ Debt}$$

Since  $\beta \text{ Debt}$  is not given to us, we assume it to be Zero

Equity	= 90,00,000
Debt	= 60,00,000
Total	= 1,50,00,000

Therefore,  $\beta$  Assets =  $1.9 \times 90/150 = 1.14$

2) Cost of Capital

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

$$K_e = \text{Cost of Capital}$$

$$R_f = \text{Risk Free Rate}$$

$$R_M = \text{Market Return}$$

$$R_M - R_f = \text{Market Risk Premium}$$

$$\text{Therefore, } K_e = 9\% + 1.14 \times 12\% = 22.68\%$$

**Question 2**

Nov 2008 RTP

A share of Tension-out Economy Ltd. is currently quoted at, a price earning ratio of 7.5 times. The retained earnings per share being 37.5% is Rs.3 per share. Compute:

- (1) The company's cost of equity, if investors expect annual growth rate of 12%.
- (2) If anticipated growth rate is 13% p.a., calculate the indicated market price, with same cost of capital.
- (3) If the company's cost of capital is 18% and anticipated growth rate is 15% p.a., calculate the market price per share, assuming other conditions remain the same.

**Solution :**

$$\text{Retained Earning} = \text{Rs.3} = 37.5\%$$

$$\therefore \text{Earnings} = \text{Rs.8} \left( \frac{3}{37.5\%} \right)$$

$$\therefore \text{Dividend} = \text{Rs.5} (8 - 3)$$

$$\text{P.E. ratio} = 7.5$$

$$\text{MPs} = \text{EPs} \times \text{P.E.} = 8 \times 7.5 = \text{Rs.60/share}$$

$$IV = \frac{D_1}{R_e - g}$$

A)  $R_e = ?$ , if  $g = 12\%$

$$\therefore 60 = \frac{5}{R_e - 0.12} \therefore R_e = 20.33\%$$

B) If  $g = 13\%$

$$\therefore IV = \frac{5}{0.2033 - 0.13} = \text{Rs.68.21/share}$$

C) If  $R_e = 18\%$ ,  $g = 15\%$

$$\therefore IV = \frac{5}{0.18 - 0.15} = \text{Rs.166.67/share}$$

**Question 3**

Nov 2008 RTP

Truly Plc presently paid a dividend of £1.00 per share and has a share price of £. 20.00.

- (i) If this dividend were expected to grow at a rate of 12% per annum forever, what is the firm's expected or required return on equity using a dividend-discount model approach?
- (ii) Instead of this situation in part (i), suppose that the dividends were expected to grow at a rate of 20% per annum for 5 years and 10% per year thereafter. Now what is the firm's expected, or required, return on equity?

**Solution :**

- (i) Dividend are expected to grow at 12% per annum forever

$$IV = \frac{D_1}{Re-g}$$

$$20 = \frac{1.2}{Re-0.12}$$

$$Re = 18\%$$

- (ii) If the dividend are expected to grow at the rate of 20% for 5 years and 10% thereafter  
WE will have to use the concept of Trial and Error to get the answer i.e. IV = 20

Let say Re = 20%

IV for first years (Stage 1)

Yrs	Dividend	Pv (20%)
1	1.2	1
2	1.44	1
3	1.73	1
4	2.07	1
5	2.49	1
<b>Total</b>		<b>5</b>

Iv for Next Years (Stage 2)

$$IV_5 = \frac{D_6}{Re - g}$$

$$= \frac{2.49(1.1)}{0.2 - 0.1} = 27.39$$

$$IV_0 = \frac{27.39}{(1.2)^5} = 11$$

Total Iv (Stage 1 + Stage 2) = 5 + 11 = 16

Since IV is 16 which is less than 20, we will have to reduce the discounting rate to get to 20

Let say Re = 18%

IV for first years (Stage 1)

Yrs	Dividend	Pv (18%)
1	1.2	1.02
2	1.44	1.03
3	1.73	1.05
4	2.07	1.07

5	2.49	1.09
<b>Total</b>		<b>5.26</b>

IV for Next Years (Stage 2)

$$IV_5 = \frac{D_6}{Re - g}$$

$$= \frac{2.49(1.1)}{0.18 - 0.1} = 34.24$$

$$IV_0 = \frac{34.24}{(1.18)^5} = 14.96$$

Total IV (Stage 1 + Stage 2) = 20.21 which is a bit higher than 20

Therefore  $Re = 18.1\%$  (Approximately) (Alternatively we can also use formula for IRR)

**2009**

**Question 4**

**May 2009 RTP**

An investor is holding 2000 shares of X Ltd. Current year dividend rate is Rs. 2 per share. Market price of the share is Rs. 30 each. The investor is concerned about several factors are likely to change during the next financial year as indicated below :

	<b>Current Year</b>	<b>Next Year</b>
Dividend paid / anticipated per share (Rs.)	2	1.8
Risk free rate	12%	10%
Market Risk Premium	5%	4%
Beta Value	1.3	1.4
Expected growth	9%	7%

In view of the above, advise whether the investor should buy, hold or sell the shares.

**Solution :**

	<b>Current</b>	<b>Next</b>
$Re = Rf + \beta(Rm - Rf)$	$12 + 1.3(5) = 18.5\%$	$10 + 1.4(4) = 15.6\%$
$IV = \frac{D_1}{Re - g}$	$= \frac{2(1.09)}{0.185 - 0.09}$ =Rs.22.95 /sh.	$= \frac{1.8(1.07)}{0.156 - 0.07}$ Rs.22.40/sh.

**Question 5**

**May 2009 Paper – 6 Marks**

Calculate the value of share from the following information:

Profit of the company	Rs. 290 crores
Equity capital of company	Rs. 1,300 crores
Par value of share	Rs. 40 each
Debt ratio of company	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	Rs. 47
Depreciation per share	Rs. 39
Change in Working capital	Rs. 3.45 per share

**Solution :**

$$IV = \frac{FCFE_1}{K_c - g}$$

FCFE = PAT – NI (Net Investment)

PAT = 290 Crores

PAT/Shares i.e EPS =

No of shares =  $1300 / 40 = 32.5$  Crores

$$EPS = \frac{PAT}{\text{No.of shares}} = \frac{290}{32.5} = \text{Rs. } 8.923 \text{ per share}$$

$$\begin{aligned} NI &= [(Capital\ Spending - Depreciation) + \Delta\ Working\ Capital] (1 - 0.27) \\ &= [(47 - 39) + 3.45] (1 - 0.27) \\ &= 11.45 (1 - 0.27) \\ &= 8.3585 \end{aligned}$$

$$FCFE = 8.923 - 8.3585 = 0.5645$$

$$\begin{aligned} Re &= R_f + \beta (RM - R_f) \\ &= 8.7 + 0.1 (10.3 - 8.7) = 8.86\% \end{aligned}$$

$$IV = \frac{0.5645(1.08)}{0.0886 - 0.08} = \text{Rs. } 70.89 / \text{ shares}$$

**Question 6**

Nov 2009 RTP

Consider the following operating information gathered from 3 companies that are identical except for their capital structures:

	P Ltd.	Q Ltd.	R Ltd.
Total invested capital	€ 100,000	€ 100,000	€ 100,000
Debt/assets ratio	0.80	0.50	0.20
Shares outstanding	6,100	8,300	10,000
Before-tax cost of debt	14%	12%	10%
Cost of equity	26%	22%	20%
Operating income,(EBIT)	€ 25,000	€ 25,000	€ 25,000
Net Income	€ 8,970	€ 12,350	€ 14,950
Tax rate	35%	35%	35%

- Compute the weighted average cost of capital, WACC, for each firm.
- Compute the Economic Value Added, EVA, for each firm.
- Based on the results of your computations in part b, which firm would be considered the best investment? Why?

- (d) Assume the industry PIE ratio generally is 15 x. Using the industry norm, estimate the price for each share.
- (e) What factors would cause you to adjust the PIE ratio value used in part d so that it is more appropriate?

**Solution :**

(a)

	P Ltd.	Q Ltd.	R Ltd.
$\frac{WACC}{Kd} = i(1-t)$	$14(1-0.35)$ 9.1	$12(1-0.35)$ 7.8	$10(1-0.35)$ 6.5
Ke	26%	22%	20%
$Kc = w + Ke + w + Kd$	$= 9.1 \times 0.8 + 26 \times 0.2 = 12.48\%$	$= 7.8 \times 0.5 + 22 \times 0.5 = 14.9\%$	$= 6.5 \times 0.2 + 20 \times 0.8 = 17.3\%$

(b)

	P Ltd.	Q Ltd.	R Ltd.
EVA = NOPAT – Kc NOPAT = EVIT – Tax	$25000(1-0.35)$ = 16250	16250	16250
$Kc = \text{Capital} \times Kc$	$100000 \times 12.48\% =$ 12480	$100000 \times 14.9\% =$ 14900	$100000 \times 17.3\% =$ 17300
EVA	3770	1350	-1050

- (c)  $EVAP > EVAQ > EVAR$ ; Thus, P Ltd. would be considered the best investment. The result should have been obvious, given that the firms have the same EBIT, but  $WACC_P < WACC_Q < WACC_R$ .

(d)

	P Ltd.	Q Ltd.	R Ltd.
EBIT	€ 25,000	€ 25,000	€ 25,000
Interest*	(11,200)	(6,000)	(2,000)
PBT	13,800	19,000	23,000
Tax (35%)	(4,830)	(6,650)	(8,050)
Net income	€ 8,970	€ 12,350	€ 14,950
Shares	6,100	8,300	10,000
EPS	€ 1.470	€ 1.488	€ 1.495
Stock price: P/E = 15x	€ 22.05	€ 22.32	€ 22.425

$$\text{*Interest P} = €100,000(0.80) \times 0.14 = €11,200$$

$$\text{Interest Q} = €100,000(0.50) \times 0.12 = € 6,000$$

$$\text{Interest R} = €100,000(0.20) \times 0.10 = € 2,000$$

- (e) Given the three firms have substantially different capital structures, we would expect that they also have different degrees of financial risk. Therefore, we might want to adjust the P/E ratios to account for the risk differences.

**Question 7****Nov 2009 RTP**

Associated Advertising Agency (AAA) just announced that the current financial year's income statement reports its net income to be Rs.12,00,000. AAA's marginal tax rate is 40 percent, and its interest expense for the year was Rs.15,00,000. The company has Rs.80,00,000 of invested capital, of which 60 percent is debt. In addition, AAA tries to maintain a weighted average cost of capital (WACC) near 12 percent.

- Compute the operating income, or EBIT, AAA earned in the current year.
- What is AAA's Economic Value Added (EVA) for the current year?
- AAA has 5,00,000 equity share outstanding. According to the EVA value you computed in part b, how much can AAA pay in dividends per share before the value of the firm would start to decrease? If AAA does not pay any dividends, what would you expect to happen to the value of the firm?

**Solution :**

- Taxable income = Net income / (1 - 0.40)

$$\text{Taxable income} = (\text{Rs. } 12,00,000) / (1 - 0.40) = \text{Rs. } 20,00,000 = \text{EBIT} - \text{Interest}$$

$$\begin{aligned} \text{EBIT} &= \text{Taxable income} + \text{Interest} \\ &= \text{Rs. } 20,00,000 + \text{Rs. } 15,00,000 \\ &= \text{Rs. } 35,00,000 \end{aligned}$$

- EVA = EBIT(1 - T) - (WACC X Invested capital)
- $$\begin{aligned} &= \text{Rs. } 35,00,000(1 - 0.40) - (0.12 \times \text{Rs. } 80,00,000) \\ &= \text{Rs. } 21,00,000 - \text{Rs. } 9,60,000 \\ &= \text{Rs. } 11,40,000 \end{aligned}$$

- EVA dividend = (Rs. 11,40,000) / 500,000 = Rs. 2.28.

If AAA does not pay a dividend, we would expect the value of the firm to increase because it will achieve higher growth, hence a higher level of EBIT. If EBIT is higher, then, all else equal, the value of the firm will increase. (This assumes the firm has positive NPV projects in which to invest.)

**Question 8****Nov 2009 Paper – 6 Marks**

Following Financial data are available for PQR Ltd. for the year 2008 :

	(Rs. in lakh)
8% debentures	125
10% bonds (2007)	50
Equity shares (Rs. 10 each)	100
Reserves and Surplus	300
Total Assets	600
Assets Turnovers ratio	1.1
Effective interest rate	8%
Effective tax rate	40%

Operating margin	10%
Dividend payout ratio	16.67%
Current market Price of Share	14
Required rate of return of investors	15%

You are required to:

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

### Solution :

(i) Income Statement :

$$\text{Asset turnover ratio} = \frac{\text{Sales}}{\text{Assets}} = 1.1$$

$$\text{Total Assets} = \text{Rs. } 600$$

$$\text{Turnover Rs. } 600 \text{ lakhs} \times 11 = \text{Rs. } 660 \text{ lakhs}$$

$$\text{Effective interest rate} = \frac{\text{Interest}}{\text{Liabilities}} = 8\%$$

$$\text{Liabilities} = \text{Rs. } 125 \text{ lakhs} + 50 \text{ lakhs} = 175 \text{ lakh}$$

$$\text{Interest} = \text{Rs. } 175 \text{ lakhs} \times 0.08 = \text{Rs. } 14 \text{ lakh}$$

$$\text{Operating Margin} = 10\%$$

$$\text{Hence operating cost} = (1 - 0.10) \text{ Rs. } 660 \text{ lakhs} = \text{Rs. } 594 \text{ lakh}$$

$$\text{Dividend Payout} = 16.67\%$$

$$\text{Tax rate} = 40\%$$

Income statement	(Rs. Lakhs)
Sale	660
Operating Exp	<u>594</u>
EBIT	66
Interest	<u>14</u>
EBT	52
Tax @ 40%	<u>20.80</u>
EAT	31.20
Dividend @ 16.67%	<u>5.20</u>
Retained Earnings	<u>26.00</u>

(ii)  $G = br$

$G = \text{Growth}$

$b = \text{Retention Ratio}$

$r = \text{ROE}$

$$\text{ROE} = \frac{\text{PAT}}{\text{Equity}} = \frac{31.20}{100 + 300} = 7.8\%$$

$$\text{Retention Ratio} = 100 - 16.67 = 83.33\%$$



$$\text{Growth} = 83.33 \times 7.8\% = 6.5\%$$

$$\begin{aligned} \text{(iii) IV} &= \frac{D_1}{Re - g} \\ D &= 5.2/10 = 0.52 \text{ per share} \\ Ke &= 15\% \\ G &= 6.5\% \\ \text{IV} &= \frac{0.52 + 6.5\%}{0.15 - 0.065} = \text{Rs.6.51 per share} \end{aligned}$$

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

**Question 9****Nov 2009 Paper – 6 Marks**

A firm had been paid dividend at Rs.2 per share last year. The estimated growth of the dividends from the company is estimated to be 5% p.a. Determine the estimated market price of the equity share if the estimated growth rate of dividends (i) rises to 8%, and (ii) falls to 3%. Also find out the present market price of the share, given that the required rate of return of the equity investors is 15.5%.

**Solution :**

$$\begin{aligned} \text{Current IV} &= \frac{D_1}{Re - g} \\ &= \frac{2(1.05)}{0.155 - 0.05} = \text{Rs.20/share} \\ \text{IV (growth rate = 8\%)} &= \frac{D_1}{Re - g} \\ &= \frac{2(1.08)}{0.155 - 0.08} = \text{Rs.28.8 /share} \\ \text{IV (growth rate = 3\%)} &= \frac{D_1}{Re - g} \\ &= \frac{2(1.03)}{0.155 - 0.03} = \text{Rs.16.48 /share} \end{aligned}$$

**Note :** IV and growth share direct relationship. Higher the growth, higher the share price and vice versa.

**2010****Question 10****May 2010 RTP**

Suppose you are verifying a valuation done on an established company by a well-known analyst has estimated a value of Rs.750 lakhs, based upon the expected free cash flow next year, of Rs.30 lakhs, and with an expected growth rate of 5%.

You found that, he 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 following information:

- (a) Company has a cost of equity of 12%.  
 (b) After-tax cost of debt of 6%.  
 (c) 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 company.

### Solution :

#### Step 1:

$$= 750 = \frac{30}{K_c - 0.05}$$

$$K_c = 9\%$$

#### Step 2:

Let X be the weight of Debt, then weight of equity = 1 - x

Given Cost of equity = 12%;

Cost of debt = 6% then

$$12\% (1-X) + 6\% X = 9$$

Hence X = 0.50 : So book value weight for debt was 50%

#### Step3:

The above wts were based on book value. Weight based on market value will be

$$\text{Equity} = 0.5 \times 3 = 1.5$$

$$\text{Debt} = 0.5 \times 1 = 0.5$$

$$\text{Total} = 2$$

#### Step 4:

Kc based or market value weights

$$12 \times \frac{1.5}{2} + 8 \times \frac{0.5}{2} = 10.5$$

#### Step 5:

$$= \frac{30}{0.105 - 0.05} = 545.45 \text{ lakhs}$$

Correct firm value = Rs. 545.45 lakhs

### Question 11

May 2010 RTP

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

Share Price	Rs.66 per share
Outstanding debt	1934 lakh
Number of outstanding shares	75 lakh

Net income	17.2 lakh
EBIT 245 lakh	
Interest expenses	218.125 lakh
Capital expenditure	234.4 lakh
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 (year 2014 beyond)

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

**Solution :**

- |        |                |
|--------|----------------|
| EBIT   | 245            |
| – Int. | <u>218.125</u> |
| EBT    | 26.875         |
| – Tax  | <u>9.675</u>   |
| EAT    | <u>17.2</u>    |
- Tax rate =  $\frac{9.675}{26.875} \times 100 = 36\%$
- % Interest =  $\frac{218.125}{1934} \times 100 = 11.28\%$
- 

Kc for 1 <sup>st</sup> 5 years	Kc beyond 5 yrs. ..
Ke = 16%	Ke = 16%
Kd = 11.28(1 – 0.36) = 7.22%	Debt = 1934 × 0.7 = 1353.8
MV of equity = 75 × 66 = Rs. 4950	Equity = 4950
Debt = 1934	Total = 6303.8
Total = 6884	
$Kc = \frac{4950}{6884} \times 16 + \frac{1934}{6884} \times 7.22 = 13.53\%$	$Kc = \frac{4950}{6303.8} \times 16\% + \frac{1353.8}{6303.8} \times 7.22\% = 14.11\%$

5)

**Stage 1**

	2009	2010	2011	2012	2013	2014	2015
1) NOPAT							
EBIT	245	264.6	285.768	308.629	333.32	359.98	
	245 × (8%)						

-Tax (30%)							
NOPAT		169.34	182.89	197.5	213.32	230.39	
2) NI							
CS-Dep.		-	-	-	-	-	
$\Delta$ WC		3.52	3.801	4.11	4.43	4.79	
		(44 × 8%)					
NI		3.52	3.801	4.11	4.43	4.79	
FCFF		165.82	179.089	193.39	208.89	225.6	240.336
DF		0.881	0.776	0.683	0.602	0.530	
DCF		146.08	138.97	132.09	125.75	119.56	

Total = 662.45

6) **Stage 2**

$$V_5 = \frac{FCFF_6}{K_e - g} = \frac{240.336}{0.1411 - 0.06}$$

$$= 2963.45$$

$$V_0 = 2963.45 \times 0.530 = 1570.6298$$

7) Total value of firm = 662.45 + 1570.6298 = 2233.0798

Less Value of debt 1934

Value of 299.0798

Value of equity  $\frac{299.0798}{75} = \text{Rs. } 3.9877 / \text{share}$

**Question 12**

May 2010 RTP

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 Rs.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 Rs.40 lakhs for the patent rights. Herbal's assets include Rs.20 lakhs of working capital and Rs.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)?

**Solution :**

$$EVA = \text{Income earned} - (\text{Cost of capital} \times \text{Total Investment})$$

**Total Investments**

Particulars	Amount
Working capital	Rs.20 lakhs
Property, plant, and equipment	Rs.80 lakhs
Patent rights	Rs.40 lakhs
<b>Total</b>	<b>Rs.140 lakhs</b>

**Cost of Capital 15%**

EVA = Rs.12 lakh – (0.15 x Rs.140 lakhs)  
 = Rs.12 lakh – Rs.21 lakh = - Rs.9 lakh  
 Thus Herbal Gyan has a negative EVA of Rs.9 lakhs.

**Question 13****May 2010 Paper – 12 Marks**

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
Net Income	8,970	12,350	14,950

The tax rate is uniform 35% in all cases.

- Compute the Weighted average cost of capital for each company.
- Compute the Economic Valued 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 15x, estimate the price for the share of each company.
- Calculate the estimated market capitalisation for each of the Companies.

**Solution :**

(a)

	Orange	Grape	Apple
$\frac{WACC}{K_d} = i(1-t)$	$14(1-0.35)$ 9.1	$12(1-0.35)$ 7.8	$10(1-0.35)$ 6.5
$K_e$	26%	22%	20%
$K_c = w + K_e + w + K_d$	$= 9.1 \times 0.8 + 26 \times 0.2 = 12.48\%$	$= 7.8 \times 0.5 + 22 \times 0.5 = 14.9\%$	$= 6.5 \times 0.2 + 20 \times 0.8 = 17.3\%$

(b)

	Orange	Grape	Apple
EVA = NOPAT – Kc NOPAT = EVIT – Tax	$25000(1-0.35)$ = 16250	16250	16250
$K_c = \text{Capital} \times K_c$	$100000 \times 12.48\% =$ 12480	$100000 \times 14.9\% =$ 14900	$100000 \times 17.3\% =$ 17300
EVA	3770	1350	-1050

(c)  $EVAP > EVAQ > EVAR$ ; Thus, P Ltd. would be considered the best investment. The result should have been obvious, given that the firms have the same EBIT, but  $WACCP < WACCQ < WACCR$ .

(d)

	Orange	Grape	Apple
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EBIT	€ 25,000	€ 25,000	€ 25,000
Interest*	(11,200)	(6,000)	(2,000)
PBT	13,800	19,000	23,000
Tax (35%)	(4,830)	(6,650)	(8,050)
Net income	€ 8,970	€ 12,350	€ 14,950
Shares	6,100	8,300	10,000
EPS	€ 1.470	€ 1.488	€ 1.495
Stock price: P/E = 15x	€ 22.05	€ 22.32	€ 22.425

$$\text{*Interest P} = €100,000(0.80) \times 0.14 = €11,200$$

$$\text{Interest Q} = €100,000(0.50) \times 0.12 = € 6,000$$

$$\text{Interest R} = €100,000(0.20) \times 0.10 = € 2,000$$

- (e) Given the three firms have substantially different capital structures, we would expect that they also have different degrees of financial risk. Therefore, we might want to adjust the P/E ratios to account for the risk differences.

**Question 14**

Nov 2010 - RTP

From the following data compute the value of business using EVA method.

	Current Period		Projected Periods
	2010	2011	2012
Total Invested Capital	90,00,000	1,00,00,000	1,10,00,000
Adjusted NOPAT	12,60,000	14,00,000	16,00,000
WACC	8.42%		

Capital Growth (g) is projected = 6.5% per year after 2012.

**Solution :**

Valuation Equation

$$\text{EVA}_t = \text{NOPAT}_t - (\text{Total Invest Capital}_t \times \text{WACC}_t)$$

$$\text{EVA}_1 = \text{Rs.}14,00,000 - (\text{Rs.}1,00,00,000 \times 0.0842) = \text{Rs.}5,58,000$$

$$\text{EVA}_2 = \text{Rs.}16,00,000 - (\text{Rs.}1,10,00,000 \times 0.0842) = \text{Rs.}6,73,800$$

Total Valuation Equation

$$= \frac{558000}{1.0842} + \frac{673800}{(1.0842)^2} + \left[ \frac{673800(1 + 0.065)}{0.0842 - 0.065} \right] \frac{1}{(1.0842)^2}$$

$$= \text{Rs.}5,14,665 + \text{Rs.}5,73,207 + \text{Rs.}3,17,95,128 + \text{Rs.}90,00,000$$

$$= \text{Rs.}4,18,83,000$$

**Question 15**

Nov 2010 – RTP

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 firms three segments are as follows :

Business Segment	Segment sales	Segment assets	Segment operating income
Whole sale	€225,000	€600,000	€75,000
Retail	€720,000	€500,000	€150,000
General	€2,500,000	€4,000,000	€700,000

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

Business Segment	Capitalization/Sales	Capitalization Assets	Capitalization / Operating Income
Wholesale	0.85	0.7	9
Retail	1.2	0.7	8
General	0.8	0.7	4

### Solution :

Wholesale

$$\begin{array}{rcl}
 \text{Sales } 225000 \times 0.85 & = & 191250 \\
 \text{Assets } 600000 \times 0.7 & = & 420000 \\
 \text{Op.Inc. } 75000 \times 9 & = & 675000
 \end{array}
 \left. \vphantom{\begin{array}{rcl} \text{Sales } 225000 \times 0.85 \\ \text{Assets } 600000 \times 0.7 \\ \text{Op.Inc. } 75000 \times 9 \end{array}} \right\} 428750 \text{ (avg.)}$$

Retail

$$\begin{array}{rcl}
 \text{Sales } 720000 \times 1.2 & = & 864000 \\
 \text{Assets } 500000 \times 0.7 & = & 350000 \\
 \text{Op.Inc. } 150000 \times 8 & = & 1200000
 \end{array}
 \left. \vphantom{\begin{array}{rcl} \text{Sales } 720000 \times 1.2 \\ \text{Assets } 500000 \times 0.7 \\ \text{Op.Inc. } 150000 \times 8 \end{array}} \right\} 804666.67$$

General

$$\begin{array}{rcl}
 \text{Sales } 2500000 \times 0.8 & = & 2000000 \\
 \text{Assets } 4000000 \times 0.7 & = & 2800000 \\
 \text{Op.Inc. } 700000 \times 4 & = & 2800000
 \end{array}
 \left. \vphantom{\begin{array}{rcl} \text{Sales } 2500000 \times 0.8 \\ \text{Assets } 4000000 \times 0.7 \\ \text{Op.Inc. } 700000 \times 4 \end{array}} \right\} 2533333.33$$

$$\text{TOTAL} \qquad \qquad \qquad \underline{\qquad \qquad \qquad} \qquad \qquad \qquad 3766750$$

### Question 16

Nov 2010 Paper – 5 Marks

Amal Ltd. has been maintaining a growth rate of 12% in dividends. The company has paid dividend @ Rs.3 per share. The rate of return on market portfolio is 15% and the risk free rate of return in the market has been observed as 10%. The beta co-efficient of the company's share is 1.2. You are required to calculate the expected rate of return on the company's shares as per CAPM model and the equilibrium price per share by dividend growth model.

### Solution :

$$\begin{aligned}
 R_e &= R_f + \beta(R_m - R_f) \\
 &= 10 + 1.2(15 - 10)
 \end{aligned}$$

$$= 10 + 6 = 16\%$$

$$\begin{aligned} \text{IV} &= \frac{D_1}{Re - g} \\ &= \frac{3 \times (1.12)}{0.16 - 0.12} = \text{Rs.84/share} \end{aligned}$$

**Question 17****Nov 2010 Paper – 8 Marks**

Delta Ltd.'s current financial year's income statement reports its net income as Rs.15,00,000. Delta's marginal tax rate is 40% and its interest expense for the year was Rs.15,00,000. The company has Rs.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%.

1. Compute the operating income or EBIT earned by Delta Ltd. in the current year.
2. What is Delta Ltd.'s Economic Value Added (EVA) for the current year?
3. 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?

**Solution :**

- 1) Operating Income (EBIT)
 

NPAT	15,00,000
+ tax. (40%)	<u>10,00,000</u>
NPBT	25,00,000
+ Int.	<u>15,00,000</u>
EBIT	40,00,000
- 2) EVA = NOPAT – Kc
  - a) NOPAT = 40,00,000 – 40%  
= 24,00,000
  - b) Cost of capital = 1,00,00,000 × 12.6  
= Rs. 12,60,000
  - c) EVA = 24,00,000 – 12,60,000  
= 11,40,000
- 3) Max. dividend per share =  $\frac{11,40,000}{2,50,000} = 4.56/\text{share}$

The value of firm will increase provided NPV is positive.

**Question 18****Nov 2010 Paper – 8 Marks**

A valuation done of an established company by a well-known analyst has estimated a value of Rs.500 lakhs, based on the expected free cash flow for next year of Rs.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.

**Solution :**

$$V_0 = \frac{FCFF_1}{K_c - 1}$$

$$500 = \frac{20}{K_c - 0.05}$$

$$K_c = 0.09 \text{ i.e. } 9\%$$

Let the weight of the debt be  $x$

Wt of Equity will be  $(1-x)$

$$\begin{aligned} \text{WACC} &= \text{Wt debt} + \text{Wt Equity} \\ &= 12(1-x) + 6(x) = 9 \end{aligned}$$

$$X = 0.5 \text{ --- these were old weights}$$

i.e. equity and debt were 50 – 50 (book values), however equity shall be  $50 \times 3 = 150$  and debt shall be  $50 \times 1 = 50$ . This puts the weights to 75 : 25 (Equity/Debt)

$$\text{New WACC} = 12(0.75) + 6(0.25) = 10.50\%$$

$$V_0 = \frac{FCFF_1}{K_c - 1} = \frac{20}{0.105 - 0.05} = \text{Rs.}363.64$$

**2011**

**Question 19**

**May 2011 - RTP**

Calculate Economic Value Added (EVA) with the help of the following information of Hypothetical Limited:

Financial leverage : 1.4 times

Capital structure : Equity Capital Rs.170 lakhs

Reserves and surplus Rs.130 lakhs

10% Debentures Rs.400 lakhs

Cost of Equity : 17.5%

Income Tax Rate : 30%.

**Solution :**

EBIT	140	1.4
– Int	<u>40</u>	<u>0.4</u>
EBT	100	1.0

$$\text{EBIT} = \frac{40}{0.4} \times 1.4 = 140$$

$$\text{NOPAT} = \text{EBIT} (1 - t) = 140(1 - 0.3) = 98$$

$$K_e = 17.5\%$$

$$K_d = 10(1 - 0.3) = 7\%$$

$$\text{WACC} = \frac{300}{700} \times 17.5 + \frac{400}{700} \times 7\%$$

$$\therefore \text{Cost of capital} = 700 \times 11.5\% = 80.5$$

$$\text{EVA} = 98 - 80.5 = 17.5$$

**Question 20**

May 2011 RTP

A share of Tension-free Economy Ltd. is currently quoted at, a price earning ratio of 7.5 times. The retained earnings per share being 37.5% is Rs.3 per share. Compute:

- (1) The company's cost of equity, if investors expect annual growth rate of 12%.
- (2) If anticipated growth rate is 13% p.a., calculate the indicated market price, with same cost of capital.
- (3) If the company's cost of capital is 18% and anticipated growth rate is 15% p.a., calculate the market price per share, assuming other conditions remain the same.

**Solution :**

$$\text{Retained Earning} = \text{Rs.}3 = 37.5\%$$

$$\therefore \text{Earnings} = \text{Rs.}8 \left( \frac{3}{37.5\%} \right)$$

$$\therefore \text{Dividend} = \text{Rs.}5 (8 - 3)$$

$$\text{P.E. ratio} = 7.5$$

$$\begin{aligned} \text{MPs} &= \text{EPs} \times \text{P.E.} = 8 \times 7.5 \\ &= \text{Rs.}60/\text{share} \end{aligned}$$

$$\text{Re} = ?, \text{ if } g = 12\%$$

$$\text{A) IV} = \frac{D_1}{\text{Re} - g}$$

$$\therefore 60 = \frac{5(1.12)}{\text{Re} - g} \therefore \text{Re} = 21.33\%$$

$$\text{B) If } g = 13\%$$

$$\therefore \text{IV} = \frac{5(1.13)}{0.2133 - 0.13} = \text{Rs.}67.83/\text{share}$$

$$\text{C) If } \text{Re} = 18\%, g = 15\%$$

$$\therefore \text{IV} = \frac{5(1.15)}{0.18 - 0.15} = \text{Rs.}191.67/\text{share}$$

**Question 21**

May 2011 - RTP

Given below is the Balance Sheet of S Ltd. as on 31.3.2010:

Liabilities	Rs.(in lakhs)	Assets	Rs.(in lakhs)
Share Capital (share of Rs. 10)	100	Land and Building	40
Reserves and Surplus	40	Plant and Machinery	80
Creditors	30	Investments	10
		Stock	20
		Debtors	15
		Cash at Bank	5
	170		170

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 Rs. 64 lakhs includes Rs. 4 lakhs extraordinary income and Rs. 1 lakh income from investments of surplus funds; such surplus funds are unlikely to recur.
- (ii) In subsequent years, additional advertisement expenses of Rs. 5 lakhs are expected to be incurred each year.
- (iii) Market value of Land and Building and Plant and Machinery have been ascertained at Rs. 96 lakhs and Rs. 100 lakhs respectively. This will entail additional depreciation of Rs. 6 lakhs each year.
- (iv) Effective Income-tax rate is 30%.
- (v) The capitalization rate applicable to similar businesses is 15%.

### Solution :

- 1) Net Assets Value
 

Assets (R.V.)	
L & B	96
P & M	100
Investments	10
Stock	20
Debtors	15
Cash / Bank	<u>5</u>
	246
Less Liabilities (R.V.)	
Creditors	<u>30</u>
Net Assets	216
- I.V. =  $\frac{\text{Net Assets for ESH}}{\text{No. of shares}}$ 

$$= \frac{216}{10}$$

$$= \text{Rs.21.6/share}$$
- 2) Yield value
 

ERR	
Profit	64

- Extra Inc.	(4)
- Inc. from Inv.	(1)
- Add. Exp.	(5)
- Add. Dep.	(6)
NPBT	48
- tax @ 30%	14.4
NPAT	33.6

$$\text{ERR} = \frac{33.6}{100} \times 100 = 33.6\%$$

(Capital)

$$\text{NRR} = 15\%$$

$$\text{Yield} = \frac{33.6}{\text{NRR}} \times 100 = \frac{33.6}{15} \times 100 = 22.4/\text{share}$$

$$\begin{aligned} 3) \quad \text{Fair value} &= \frac{\text{IV} + \text{Yield}}{2} \\ &= \frac{21.6 + 22.4}{2} \\ &= \text{Rs.}22/\text{share} \end{aligned}$$

### Question 22

May 2011 - Paper – 8 Marks

A share of Voyage Ltd. is currently quoted at, a price earning of 8 times. The retained earnings per share being 45% is 5 per share. Compute

- The company's cost of equity, if investors expect annual growth rate of 15%
- If anticipated growth rate is 16% p.a, calculate the indicated market price, with same cost of capital.
- If the company's cost of capital is 20% and the anticipated growth rate is 19% p.a. calculate the market price per share, assuming other conditions remaining the same.

### Solution :

$$\text{Retained Earning} = \text{Rs.}5 = 45\%$$

$$\therefore \text{Earnings} = \text{Rs.}11.11 \left( \frac{5}{45\%} \right)$$

$$\therefore \text{Dividend} = \text{Rs.}6.11 (11.11 - 5)$$

$$\text{P.E. ratio} = 8$$

$$\begin{aligned} \text{MPs} &= \text{EPS} \times \text{P.E.} = 11.11 \times 8 \\ &= \text{Rs.}88.88/\text{share} \end{aligned}$$

$$\text{A) } \text{Re} = ?, \text{ if } g = 15\%$$

$$\text{IV} = \frac{D_1}{\text{Re} - g}$$

$$\therefore 88.88 = \frac{6.11}{\text{Re} - 0.15} \quad \therefore \text{Re} = 21.87\%$$

- B) If  $g = 16\%$   
 $\therefore IV = \frac{6.11}{0.2287 - 0.16} = \text{Rs.}104.08/\text{share}$
- C) If  $Re = 20\%$ ,  $g = 19\%$   
 $\therefore IV = \frac{6.11}{0.20 - 0.19} = \text{Rs.}611/\text{share}$

**Question 23****May 2011 - Paper – 8 Marks**

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?

**Solution :**

- (a)
- Operating Income

NPAT	15	70%
------	----	-----

$$\therefore \text{NPBT} = \frac{15}{70\%} = 21.42$$

$$\text{EBIT} = 21.42 + 10 = 31.42$$

- (b)
- $\text{EVA} = \text{NOPAT} - \text{Cost of Capital}$

- (i) NOPAT

EBIT	31.42
------	-------

-tax (30%)	_____
NOPAT	Rs. 22

- (ii)
- $\text{Cost of Capital} = 95 \times 13\%$

$$= \text{Rs.} 12.35$$

$$\therefore \text{EVA} = 22 - 12.35$$

$$= 9.65$$

- (c) The maximum amount that a company can pay before the value of entity starts decreasing is equal to EVA.

$$\therefore \text{Max. dividend per share} = \frac{9.65}{6} = \text{Rs.}1.608/\text{share}$$

**Question 24****Nov 2011 - RTP**

ABC Ltd. has divisions A, B & C. The division C has recently reported on annual operating profit of Rs. 20,20,00,000. This figure arrived at after charging Rs. 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 Rs.60 crore, but replacement cost of these assets is estimated at Rs.84 crore

You are required to compute EVA of Division C.

### Solution :

First necessary adjustment of the data as reported by historical accounting system shall be made as follows:

	Rs.
Operating Profit	20,20,00,000
Add: Cost of unutilized Advertisement Expenditures	<u>2,00,00,000</u>
	<u>22,20,00,000</u>

Invested Capital (as per replacement cost) is Rs.84 crore.

Accordingly,

EVA = Operating Profit – (Invested Capital x Cost of Capital)

$$= \text{Rs.}22,20,00,000 - (\text{Rs.}84 \text{ crore} \times 11\%)$$

$$= \text{Rs.}22.2 \text{ crore} - \text{Rs.}9.24 \text{ crore}$$

$$= \text{Rs.}12.96 \text{ crore.}$$

### Question 25

Nov 2011 – RTP

The total market value of the equity share of O.R.E. Company is Rs.60,00,000 and the total value of the debt is Rs. 40,00,000. The treasurer estimate that the beta of the stock is currently 1.5 and that the expected risk premium on the market is 10 per cent. The treasury bill rate is 8 per cent.

### Required

- What is the beta of the company's existing portfolio of assets?
- Estimate the company's cost of capital and the discount rate for an expansion of the company's present business?

### Solution :

- Beta of Company's existing Portfolio

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

$$\beta \text{ Liabilities} = W_t \beta \text{ Equity} + w_t \beta \text{ Debt}$$

Since  $\beta$  Debt is not given to us, we assume it to be Zero

$$\text{Equity} = 60,00,000$$

$$\text{Debt} = 40,00,000$$

$$\text{Total} = 1,00,00,000$$

$$\text{Therefore, } \beta \text{ Assets} = 1.5 \times 60/100 = 0.9$$

- Cost of Capital

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

$$K_e = \text{Cost of capital}$$

$$R_f = \text{Risk Free Rate}$$

RM = Market Return  
 Rm – RF = Market Risk Premium  
 Therefore, Ke = 8 + 0.9 x 10 = 17%

**Question 26****Nov 2011 Paper – 5 Mark**

A company has a book value per share of Rs. 137.80. Its return on equity is 15% and follows a policy of retaining 60 percent of its annual earnings. If the opportunity cost of capital is 18 percent, what is the price of its share?[adopt the perpetual growth model to arrive at your solution].

**Solution :**

$$\text{EPS} = 137.80 \times 15\% = 20.67$$

$$\text{Dividend} = 20.67 \times 40\% \text{ (Retention is 60\%)} = 8.268$$

$$\begin{aligned} G &= br \\ &= 60 \times 15\% = 9\% \end{aligned}$$

$$\therefore D_1 = 8.268 \times 1.09 = 9.01$$

$$\begin{aligned} IV &= \frac{D_1}{Re - g} \\ &= \frac{9.01}{0.18 - 0.09} = \text{Rs. } 100.11/\text{share} \end{aligned}$$

**Question 27****Nov 2011 Paper – 8 Marks – Similar to - Question 15 – Nov 2010 – RTP****Question 28****Nov 2011 - Paper – 8 Marks**

Helium Ltd has evolved a new sales strategy for the next 4 years. The following information is given:

Income Statement	Rs. in thousands
Sales	40,000
Gross Margin at 30%	12,000
Accounting, administration and distribution expense at 15%	6,000
Profit before tax	6,000
Tax at 30%	1,800
Profit after tax	4,200
<b>Balance sheet information</b>	
Fixed Assets	10,000
Current Assets	5,000
Equity	15,000

As per the new strategy, sales will grow at 30 percent per year for the next four years. The gross margin ratio will increase to 35 percent. The Assets turnover ratio and income tax rate will remain unchanged.

Depreciation is to be at 15 percent on the value of the net fixed assets at the beginning of the year. Company's target rate of return is 14%.

Determine if the strategy is financially viable giving detailed workings

**Solution :**

- 1) Value of firm before strategy

$$V_f = \frac{\text{FCFE(PAT)}}{K_e} = \frac{4200}{14\%} = \text{Rs.}30,000$$

- 2) Value of firm after the strategy

- a) Stage 1

FCFE	1	2	3	4
PAT	5460 (4200 + 305)	7098	9227.4	11995.62
- NI	4500 (15000 × 30%)	5850	7605	9556.50
	960	1248	1622.4	2109.12
PV @14%	842.11	960.30	1095.07	1248.77

Total = 4146.25

- b) Stage 2

$$V_{f4} = \frac{\text{FCFE}_5}{K_e} = \frac{11995.62}{0.14} = 85683$$

$$V_{f0} = \frac{85683}{(1.14)^4} = 50731.21$$

Total value = 50731.21 + 4143.25 = 54877.46

- 3) Value of strategy

Value of firm A<sub>f</sub> strategy

54877.46

Value of firm B<sub>f</sub> strategy30000

24877.46

Advice : Since value of strategy is positive the firm should implement the strategy.

**2012****Question 29****May 2012 RTP**

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	18.00
EBT	162.00
Tax @ 35%	56.70
	105.30

Liabilities	Amount	Assets	Amount
Equity share (10 million shares of Rs.10 each)	100	Land and Building	200
Reserves	325	Computers & Software	295



Bank Loan	180	Current Assets :	
Creditors	180	Debtors	150
		Bank	100
		Cash	40
	<b>785</b>		<b>785</b>

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

- (a) Economic Value Added®  
 (b) Market Value Added.

Assuming that:

- (i) WACC is 12%.  
 (ii) The share of company currently quoted at Rs. 50 each

### Solution :

1)  $EVA = NOPAT - \text{Cost of Capital}$

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

$$\begin{aligned} Kc &= \text{Capital} = 100 + 325 + 180 = 605 \\ &= 605 \times 12\% = 72.6 \end{aligned}$$

$$EVA = 117 - 72.6 = 44.4$$

2)  $MVA$

	MV	BV
Equity Capital	500	100
Reserves	-	325
Debt	180	180
<b>Total</b>	<b>680</b>	<b>605</b>

$$\begin{aligned} MVA &= MV - BV \\ &= 680 - 605 \\ &= 75 \end{aligned}$$

### Question 30

May 2012 RTP

Following informations 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 -	Rs. 2,000 crores
EBIT -	Rs. 300 crores
Capital expenditure -	Rs. 280 crores
Depreciation -	Rs. 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
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?

### Solution :

1)

Satge 1 Ke	Stage 2 Kc
$Re = R_f + \beta(R_m - R_f)$ $= 10 + 1.15 (6)$ $= 16.9\%$	$Re = 9 + 1 (5) = 14\%$
$Kd = i(1 - t) = 13(1 - 0.3)$ $= 9.1\%$	$Kd = 12.86(1 - 0.3) = 9\%$
$Kc = Kc \cdot 0.5 \times 9.1 + 0.5 \times 16.9$ $= 13\%$	$Kc = \frac{2}{5} \times 9 + \frac{3}{5} \times 14 = 12\%$

2) Stage 1

	Base	1	2	3	4	5
1) NOPAT						
EBIT	300	360	432	518.4	622.08	684.288
	(300 + 20%)				(622.08 + 10%)	
-Tax (30%) NOPAT		103	129.6	155.52	186.62	205.286
		252	302.4	362.88	435.46	479
2) Net Invest						
Capital Sp	280					
-Dep	200	-	-	-	-	
i)	80	96	115.2	138	165.8	Nil
	(80 + 10%)					
Revenue	2000	2400	2880	3456	4147.2	4561.92
	(2000 + 20%)				(4147.2 + 10%)	
WC	500	600	720	864	1036.8	1140.48

ii)	$\Delta W C$		100	120	144	172.8	103.68
	NI(i +ii)		196	235.2	282	338.6	103.68
	FCFF = (NOPAT – NI)		56	67.2	80.88	96.856	375.32
	PV @ 13%		49.56	52.61	56.05	59.4	

Total = 217.63

3) Stage 2

$$V_4 = \frac{FCFF_5}{K_c - g} = \frac{375.32}{0.12 - 0.1} = 18766$$

$$V_0 = \frac{18766}{(1.13)^4} = 11509.54$$

Total = Stage 1 + Stage 2

$$= 217.63 + 11509.54 = \text{Rs.}11727.17$$

### Question 31

May 2012 RTP

AB Limited's shares are currently selling at Rs.130 per share. There are 10,00,000 shares outstanding. The firm is planning to raise Rs.2 crores to Finance new project.

#### Required

What is the ex-right price of shares and value of a right, if.

- The firm offers one right share for every two shares held.
- The firm offers one right share for every four shares held.
- How does the shareholder's wealth change from (i) to (ii)? How does right issue increase shareholder's wealth.

#### Solution :

1. Firm offer one right share for 2 shares held

$$\text{No of shares to be issued} = \frac{10,00,000}{2} = 5,00,000 \text{ shares}$$

$$\text{Subscription Price} = \frac{2,00,00,000}{5,00,000} = \text{Rs. } 40 / \text{ shares}$$

$$\text{Ex Right Price} = \frac{(10,00,000 \times 130) + 2,00,00,000}{15,00,000} = \text{Rs.}100$$

$$\text{Value of Right} = 100 - 40 = \text{Rs. } 60/\text{share}$$

2. Firm offer one right share for 2 shares held

$$\text{No of shares to be issued} = \frac{10,00,000}{4} = 2,50,000 \text{ shares}$$

$$\text{Subscription Price} = \frac{2,00,00,000}{2,50,000} = \text{Rs.}80 / \text{ shares}$$

$$\text{Ex Right Price} = \frac{13,00,00,000 + 2,00,00,000}{12,50,000} = \text{Rs.120}$$

$$\text{Value of Right} = 120 - 80 = \text{Rs. 40/share}$$

3. Calculation of effect of right issue on shareholders wealth (Assuming he is holding 100 shares)

	One share for 2 held	One share for 4 held
Value of shares after right	15000 (150 x 100)	15000 (125 x 120)
Less cost of right	2000 (50 x 40)	2000 (25 x 80)
Net Value after right	13000	13000
Value before right	13000 (100 x 130)	13000 (100 x 130)
Effect of right issue	NIL	NIL

**Question 32** May 2012 Paper – Similar to - Question 22 - May 2011 - Paper – 8 Marks

**Question 33** May 2012 Paper – 6 Marks

In December, 2011 AB Co.'s share was sold for Rs. 146 per share. A long term earnings growth rate of 7.5% is anticipated. AB Co. is expected to pay dividend of Rs. 3.36 per share.

- What rate of return an investor can expect to earn assuming that dividends are expected to grow along with earnings at 7.5% per year in perpetuity?
- It is expected that AB Co. will earn about 10% on book Equity and shall retain 60% of earnings. In this case, whether, there would be any change in growth rate and cost of Equity?

**Solution :**

- According to Dividend Discount Model approach the firm's expected or required return on equity is computed as follows:

$$Re = \frac{D_1}{P_0} + g$$

Where

- Ke = Cost of equity share capital  
 D1 = Expected dividend at the end of year 1  
 P0 = Current market price of the share.  
 g = Expected growth rate of dividend.

$$\text{Therefore } Ke = \frac{3.36}{146} + 7.5 = 9.80\%$$

- With rate of return on retained earnings (r) 10% and retention ratio (b) 60%, new growth rate will be as follows:

$$g = br \quad \text{i.e.} \\ = 0.10 \times 0.60 = 0.06$$

Accordingly dividend will also get changed and to calculate this, first we shall calculate previous retention ratio (b1) and then EPS assuming that rate of return on retained earnings (r) is same.

With previous Growth Rate of 7.5% and  $r = 10\%$  the retention ratio comes out to be:

$$0.075 = b_1 \times 0.10$$

$$b_1 = 0.75 \text{ and payout ratio} = 0.25$$

With 0.25 payout ratio the EPS will be as follows:

$$3.36 = 13.44$$

$$0.25$$

With new 0.40 (1 – 0.60) payout ratio the new dividend will be

$$D_1 = 13.44 \times 0.40 = 5.376$$

$$\text{Accordingly new } K_e \text{ will be } k_e = \frac{5.376}{146} + 6.0 \quad K_e = 9.68\%$$

**Question 34****Nov 2012 RTP**

BRS Inc deals in computer and IT hardwares and peripherals. The expected revenue for the next 8 years is as follows

Years	Sales Revenue (\$ Million)
1	8
2	10
3	15
4	22
5	30
6	26
7	23
8	20

Summarized financial position as on 31<sup>st</sup> March 2012 was as follows

Liabilities	Amount	Assets	Amount
Equity Stocks	12	Fixed Assets (Net)	17
12% Bond	8	Current Assets	3
	20		20

**Additional Information:**

- (a) Its variable expenses is 40% of sales revenue and fixed operating expenses (cash) are estimated to be as follows:

Period	Amount (\$ Million)
1 – 4 years	1.6
5 – 8 years	2

- (b) An additional advertisement and sales promotion campaign shall be launched requiring expenditure as per following details:

Period	Amount (\$ Million)
--------	---------------------

1 year	0.50
2-3years	1.50
4-6years	3.00
7-8years	1.00

- (c) Fixed Assets are subject to depreciation at 15% as per WDV method.  
 (d) The company has planned capital expenditure for the coming 8 years as follows

Period	Amount (\$ Million)
1	0.50
2	0.60
3	2.00
4	2.50
5	3.50
6	2.50
7	1.50
8	1.00

- (e) Investment in working capital to be 20% of Revenue  
 (f) Applicable tax rate for the company is 30%  
 (g) Cost of Equity is estimated to be 16%  
 (h) The free cash flows of the firm is expected to grow at 5% per annum after 8 years

With above information you are required to determine the

- (i) Value of the firm  
 (ii) Value of Equity

### Solution :

- 1) Working note for depreciation

	Year	1	2	3	4	5	6	7	8
Assets	Op.	17	14.875	13.15375	12.881	13.074	14.088	14.1	13.26
+ Cap.sp.		0.5	0.6	2	2.5	3.5	2.5	1.5	1
Assets		17.5	15.475	15.15375	15.381	16.57	16.588	15.6	14.26
- Dep.		2.625	2.32125	2.273	2.3071	2.486	2.488	2.34	2.139
Assets Clo.		14.875	13.15375	12.881	13.074	14.088	14.1	13.26	12.121

- 2)  $K_c = 16\%$   
 $K_d = i(1 - t)$   
 $= 12(1 - 0.3)$   
 $= 8.4\%$   
 $WACC = \frac{12}{20} \times 16\% + \frac{8}{20} \times 8.4\%$   
 $= 12.96\%$

## 3) Calculation for NOPAT

Year	1	2	3	4	5	6	7	8
Sales	8	10	15	22	30	26	23	20
VC	3.2	4	6	8.8	12	10.4	9.2	8
FC	1.6	1.6	1.6	1.6	2	2	2	2
Adv.	0.5	1.5	1.5	3	3	3	1	1
Dep.	2.625	2.32125	2.2730	2.3071	2.4860	2.488	2.34	2.139
EBIT	0.075	0.58	3.627	6.2929	10.514	8.112	8.46	6.861
tax (30%)								
NOPAT	0.0525	0.411	2.538	4.405	7.359	5.678	5.922	4.8027

## 4) Calculation for Net Investments

Year	1	2	3	4	5	6	7	8
Cap. Sp.	0.5	0.6	2	2.5	3.5	2.5	1.5	1
-Dep.	2.625	2.32125	2.273	2.3071	2.4860	2.488	2.34	2.139
	(2.125)	(1.72125)	(0.2730)	0.1929	1.012	0.01	(0.84)	(1.139)
+ΔWC	1.6	2	3	4.4	6	5.2	4.6	4
NI	(0.525)	0.27875	(2.727)	(4.5929)	7.014	5.212	3.76	2.861

## 5) FCFF

Year	1	2	3	4	5	6	7	8
(NOPAT – NI)	0.5775	0.13225	(0.189)	(0.1879)	0.345	0.466	2.162	1.9417
PV @ 12.96%	0.511	0.1036	(0.131)	(0.115)	0.188	0.224	0.921	0.732

$$\begin{aligned}
 6) \quad V_8 &= \frac{FCFF_9}{K_c - g} \\
 &= \frac{1.9417(1.05)}{0.1296 - 0.05} \\
 &= 25.612 \\
 V_0 \text{ (Stage 2)} &= \frac{25.612}{(1.1296)^8} = 9.66
 \end{aligned}$$

$$\begin{aligned}
 7) \quad \text{Value of firm} &= \text{Stage I} + \text{Stage II} \\
 &= 2.4336 \\
 &= 2.4336 + 9.66 \\
 &= 12.09 \\
 \text{Value of equity} &= \text{Value of Firm} - \text{Value of Debt} \\
 &= 12.09 - 8
 \end{aligned}$$

= 4.09

**Question 35****Nov 2012 Paper – 12 Marks**

H Ltd. agrees to buy over the business of B Ltd. effective 1st April, 2012. The summarized Balance Sheets of H Ltd. and B Ltd. as on 31st March 2012 are as follows:

Balance sheet as at 31st March, 2012 (In Crores of Rupees)

<b>Liabilities:</b>	<b>H. Ltd</b>	<b>B. Ltd.</b>
Paid up Share Capital		
-Equity Shares of Rs.100 each	350.00	
-Equity Shares of Rs.10 each		6.50
Reserve & Surplus	950.00	25.00
<b>Total</b>	<b>1,300.00</b>	<b>31.50</b>

<b>Assets:</b>		
Net Fixed Assets	220.00	0.50
Net Current Assets	1,020.00	29.00
Deferred Tax Assets	60.00	2.00
<b>Total</b>	<b>1,300.00</b>	<b>31.50</b>

H Ltd. proposes to buy out B Ltd. and the following information is provided to you as part of the scheme of buying:

- (1) The weighted average post tax maintainable profits of H Ltd. and B Ltd. for the last 4 years are Rs. 300 crores and Rs. 10 crores respectively.
- (2) Both the companies envisage a capitalization rate of 8%.
- (3) H Ltd. has a contingent liability of Rs. 300 crores as on 31st March, 2012.
- (4) H Ltd. to issue shares of Rs. 100 each to the shareholders of B Ltd. in terms of the exchange ratio as arrived on a Fair Value basis. (Please consider weights of 1 and 3 for the value of shares arrived on Net Asset basis and Earnings capitalization method respectively for both H Ltd. and B Ltd.)

You are required to arrive at the value of the shares of both H Ltd. and B Ltd. under:

- (i) Net Asset Value Method      (ii) Earnings Capitalisation Method

**Solution :**

- (i) Net Asset Value =  $\frac{\text{Net Assets for Equity Shareholders}}{\text{No. of Shares}}$
- H Ltd. =  $\frac{1300-300}{3.5}$  = Rs. 285.71 per share
- B Ltd. =  $\frac{31.5}{0.65}$  = Rs. 48.46 per share
- (ii) Earning Capitalization Method =  $\frac{\text{Earnings / NPR}}{\text{No. of Shares}}$



$$\text{H Ltd.} = \frac{300/0.08}{3.5} = \text{Rs. } 1071.43 \text{ per share}$$

$$\text{B Ltd.} = \frac{10/0.08}{0.65} = \text{Rs. } 192.31 \text{ per share}$$

$$\text{(iii) Fair Value} = \frac{\text{Net Assets Value} + \text{Earnings Capitalization Method}}{2}$$

$$\text{H Ltd.} = \frac{285.71 \times 1 + 1071.43 \times 3}{4} = \text{Rs. } 875 \text{ per share}$$

$$\text{B Ltd.} = \frac{48.46 \times 1 + 192.31 \times 3}{4} = \text{Rs. } 156.3475 \text{ per share}$$

$$\text{Exchange Ratio} = \frac{156.3475}{875} = 0.1787$$

H Ltd Should issue its 0.1787 share for each share of B Ltd.

### Question 36 Nov 2012 Paper – 4 Marks – Similar to - Question 19 - May 2011 - RTP

### Question 37 Nov 2012 - Paper – 8 Marks

Eagle Ltd. reported a profit of Rs. 77 lakhs after 30% tax for the financial year 2011-12. An analysis of the accounts revealed that the income included extraordinary items of Rs.8 lakhs and an extraordinary loss of Rs. 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:

	Rs. In lakhs
Sales	70
Material costs	20
Labour costs	12
Fixed costs	10

You are required to:

- Calculate the value of the business, given that the capitalization rate is 14%.
- Determine the market price per equity share, with Eagle Ltd.'s share capital being comprised of 1,00,000 13% preference shares of Rs.100 each and 50,00,000 equity shares of Rs.10 each and the P/E ratio being 10 times.

### Solution :

- Value of Business

<u>Existing Business</u>		<u>New Business</u>		
Profit After Tax	77	Sales		70
Add : Tax (30%)	33	Less		
Profit Before Tax	110	Material Cost 20	20	
Less : Extra-ordinary Income	-8	Labour Cost 12	12	
Add : Extra-ordinary Expenses	10	Fixed cost	10	-42
Profit from existing Business	112	Profit		28

Total Profit Before Tax	140		
Less : Tax (30%)	42		
FMP (After Tax)	98		

$$\text{Value of Business} = \frac{\text{Profit}}{\text{Capitalization Rate}} = \frac{98}{14\%} = 700$$

(ii) Market Price of Equity shares

Profit After Tax	98
Less Preference Dividend	<u>13</u>
Profits for Equity shareholders	85
No. of shares	50 Lakhs shares
EPS	Rs. 1.70 per shares
P.E Ratio	10
Market Price Per shares (EPS x PE)	17 shares

### Question 38

Nov 2012 - Paper – 8 Marks

Following Financial data are available for Platinum for the year 2011 :

	Rs. in lakhs
Equity share Capital	100
8% debentures	125
10% bonds (2007)	50
Equity shares (Rs. 10 each)	100
Reserves and Surplus	200
Total Assets	500
Assets Turnovers ratio	1.1
Effective tax rate	30%
Operating margin	10%
Dividend payout ratio	20%
Current market Price of Share	13
Required Return for ESH	15%

You are required to:

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

### Solution :

Workings:

Asset turnover ratio = 1.1

Total Assets = Rs.500 lakhs

Turnover Rs.500 lakhs  $\times$  1.1 = Rs.550 lakhs

## (i) Income Statement

	Rs.in Lakhs
Sales (500 $\times$ 1.1)	550.00
Less : Operating Expenses	<u>495.00</u>
EBIT (10%)	55.00
Less : Interest (125 $\times$ 0.08 + 50 $\times$ 0.1)	<u>15.00</u>
EBT	40.00
Less : Tax (30%)	<u>12.00</u>
EAT	28.00
Less : Dividend (20%)	<u>5.60</u>
Retained Earnings	22.40

## (ii) Growth Rate

$$G = br$$

$$ROE = \frac{NPAT}{\text{Net Worth}} = \frac{28}{100 + 200} \times 100 = 9.33\%$$

$$b = 1 - \text{payout ratio} = 1 - 0.2 = 0.8 = 80\%$$

$$g = 80 \times 9.33\% = 7.464\%$$

## (iii) IV of the share using Dividend Discount Model

$$IV = \frac{D_1}{K_e - g}$$

$$D_1 = \frac{5.6}{10} + 7.464\% = 0.6018$$

$$IV = \frac{0.6018}{0.15 - 0.07464} = \text{Rs.8 Per share}$$

(iv) The current market price of the shares is Rs.13 and the IV is 8, therefore the share is overpriced in the market and hence the investor should go short.

**Question 39****Nov 2012 Paper – 8 Marks**

Tiger Ltd. is presently working with an Earning before Interest and Taxes (EBIT) of Rs.90 lakhs. Its present borrowings are as follows

	Rs.in lakhs
12% term Loan	300
Working Capital Borrowings	
From Bank at 15%	200
Public Deposit at 11%	100

The sales of the company are growing and to support this, the company proposes to obtain additional borrowing of Rs.100 lakhs expected to cost 16%.The increase in EBIT is expected to be 15%.

Calculate the change in interest coverage ratio after the additional borrowing is effected and comment on the arrangement made.

**Solution :**

Calculation of Present Interest Coverage Ratio

Present EBIT = Rs.90 lakh

Interest charges (present)	Rs.in lakhs
Term loan @ 12%	36.00
Bank Borrowing @ 15%	30.00
Public Deposit @ 11%	11.00
	77.00

$$\begin{aligned} \text{Present Interest Coverage Ratio} &= \frac{\text{EBIT}}{\text{Interest Charges}} \\ &= \frac{\text{Rs.90 lakhs}}{\text{Rs.77 lakhs}} \\ &= 1.169 \end{aligned}$$

Calculation of Revised Interest Coverage Ratio

Revised EBIT (115% of Rs.90 lakh)                      Rs.103.50 lakh

Proposed Interest Charges

Existing Interest Charges                                      77.00 lakh

(+) Additional charges

(16% of Additional Borrowing i.e. 100 lakhs) 16.00 lakh

**Total**    93.00 lakh

$$\begin{aligned} \text{Revised Interest Coverage Ratio} &= \frac{\text{Rs.103.50 lakhs}}{\text{Rs.93.00 lakhs}} \\ &= 1.113 \end{aligned}$$

Change in interest coverage ratio = 1.169 – 1.113 = 0.056

Note : Decrease in interest coverage ratio is adverse for entire.

**Question 40**

Nov 2012 - Paper – 8 Marks

Given the following information

Current Dividend        Rs.5.00

Discount Rate            10%

Growth Rate              2%

- 1) Calculate the present value of the stock
- 2) Is the stock over valued if the price is Rs.40. ROE = 8% and EPS = Rs.3.00. Show your calculation under the PE Multiple approach and Earnings Growth Model.

**Solution :**

(i) Iv of the share (By Dividend Discount Model)

$$Iv = \frac{D_1}{Ke - g}$$

$$D_1 = 5 + 2\% = 5.1 \text{ per share}$$

$$Iv = \frac{5.1}{0.010 - 0.02} = \text{Rs.}63.75 \text{ per share}$$

(ii) ROE = 8%

G = br

Where

G = Growth = 2%

b = Retention Ratio

r = ROE = 8%

2 = b x 8%, therefore b = 25%

Payout Ratio = 100 – 25 = 75%

Dividend = 3 x 75% = 2.25

$$\text{New Price of share} = \frac{D_1}{K_e - g} = \frac{2.25(1.02)}{0.10 - 0.02} = \text{Rs.}28.6875$$

The Stock is overpriced at 40

**2013**

**Question 41**

**May 2013 - Paper – 8 Marks**

X Limited, just declared a dividend of Rs.14.00 per share. Mr. B is planning to purchase the share of X Limited, anticipating increase in growth rate from 8% to 9%, which will continue for three years. He also expects the market price of this share to be Rs.360.00 after three years.

You are required to determine:

- the maximum amount Mr. B should pay for shares, if he requires a rate of return of 13% per annum.
- the maximum price Mr. B will be willing to pay for share, if he is of the opinion that the 9% growth can be maintained indefinitely and require 13% rate of return per annum.
- the price of share at the end of three years, if 9% growth rate is achieved and assuming other conditions remaining same as in (ii) above.

Calculate rupee amount up to two decimal points.

	Year-1	Year-2	Year-3
FVIF @ 9%	1.090	1.188	1.295
FVIF @ 13%	1.130	1.277	1.443
PVIF @ 13%	0.885	0.783	0.693

**Solution :**

(i) Stage 1

Year	Dividend	PV@13%
1	15.26	13.50
2	16.6334	13.03
3	18.13	12.56
		<b>39.09</b>

Stage 2

$$IV_0 = \frac{360}{(1.13)^3} = 250$$

$$\begin{aligned} \text{Total IV} &= 250 + 39.09 \\ &= 289.09 \end{aligned}$$

- (ii) If growth rate 9% is achieved for indefinite period, then maximum price of share should Mr. A willing be to pay is

$$IV = \frac{D_1}{Re - g} = \frac{15.26}{0.13 - 0.09} = \text{Rs.}381.50 \text{ per share}$$

- (iii) Assuming that conditions mentioned above remain same, the price expected after 3 years will

$$\text{be: } = \frac{D_4}{Ke - g} = \frac{18.13 \times 1.09}{0.04} \text{ Rs.}494 \text{ per share}$$

**Question 42**

Nov 2013 RTP – Similar to - Question 5 - May 2009 Paper – 6 Marks

**Question 43**

Nov 2013 – RTP – Similar to - Question 6 - Nov 2009 RTP

**Question 44**

Nov 2013 - Paper – 8 Marks

A share of Tension-free Economy Ltd. is currently quoted at a price earnings ratio of 7.5 times. The retained earning being 37.5% is Rs.3 per share.

Calculate

- The company's cost of equity, if investors' expected rate of return is 12%.
- Market price of share, if anticipated growth rate is 13% per annum with same cost of capital.
- Market price per share, if the company's cost of capital is 18% and anticipated growth rate is 15% per annum, assuming other conditions remaining the same.

**Solution :**

$$\text{Retained Earning} = \text{Rs.}3 = 37.5\%$$

$$\therefore \text{Earnings} = \text{Rs.}8 \left( \frac{3}{37.5\%} \right)$$

$$\therefore \text{Dividend} = \text{Rs.}5 (8 - 3)$$

$$\text{P.E. ratio} = 7.5$$

$$\begin{aligned} \text{MPs} &= \text{EPs} \times \text{P.E.} = 8 \times 7.5 \\ &= \text{Rs.}60/\text{share} \end{aligned}$$

$$\text{A) IV} = \frac{D_1}{Re - g}$$

$$\therefore 60 = \frac{5(1.12)}{Re - 0.12} \therefore Re = 21.33\%$$

$$\text{B) If } g = 13\%$$

$$\therefore IV = \frac{5(1.13)}{0.2133 - 0.13} = \text{Rs.}67.83/\text{share}$$

$$\text{C) If } Re = 18\%, g = 15\%$$

$$\therefore IV = \frac{5(1.15)}{0.18 - 0.015} = \text{Rs.}191.67/\text{share}$$

2014

**Question 45**

May 2014 - RTP

A valuation done of an established company by a well-known analyst has estimated a value of Rs. 500 lakhs, based on the expected free cash flow for next year of Rs. 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.

**Solution :**

$$V_0 = \frac{FCFF_1}{K_c - 1}$$

$$500 = \frac{20}{K_c - 0.05}$$

$$K_c = 0.09 \text{ i.e } 9\%$$

Let the weight of the debt be x

Wt of Equity will be (1-x)

$$WACC = Wt \text{ debt} + Wt \text{ Equity}$$

$$= 12(1 - x) + 6(x) = 9$$

$$X = 0.5 \text{ --- these were old weights}$$

i.e. equity and debt were 50 – 50 (book values), however equity shall be 50 x 3 = 150 and debt shall be 50 x 1 = 50. This puts the weights to 75 : 25 (Equity/Debt)

$$\text{New WACC} = 12(0.75) + 6(0.25) = 10.50\%$$

$$V_0 = \frac{FCFF_1}{K_c - 1} = \frac{20}{0.105 - 0.05} = \text{Rs. } 363.64$$

**Question 46**

May 2014 - Paper – 5 Marks

MNP Ltd. has declared and paid annual dividend of Rs. 4 per share. It is expected to grow @ 20% for the next two years and 10% thereafter. The required rate of return of equity investors is 15%. Compute the current price at which equity shares should sell.

Note: Present Value Interest Factor (PVIF) @ 15%:

$$\text{For year 1} = 0.8696;$$

$$\text{For year 2} = 0.7561$$

**Solution :****Stage 1 : Explicit Stage**

Year	Dividend	PV of Dividend (15%)
1	4.80	4.17408
2	5.76	4.355136
Total		8.529216

**Stage 2 : Horizon Stage**

$$IV_2 = \frac{D_3}{Re - g} = \frac{5.76 + 10\%}{0.15 - 0.1} = 126.72$$

$$IV_0 = 126.72 \times 0.7561 = 95.812992$$

$$\text{Total IV} = \text{Stage 1} + \text{Stage 2} = 8.529216 + 95.812992 = \text{Rs.}104.342208$$

**Question 47****May 2014 Paper – 8 Marks**

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.

	For the year ended March 31, 2014
Revenues	Rs. 7,500 Crores
Cost of Goods Sold (COGS)	Rs. 3,000 Crores
Operating Expenses	Rs. 2,250 Crores
Capital Expenditure	Rs. 750 Crores
Depreciation (included in COGS & Operating Expenses)	Rs. 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	T1	T2	T3
PVIF	0.8696	0.7561	0.6575

**Solution :**

Working Note 1 :

$$FCFF = NOPAT - NI$$

$$(i) \quad NOPAT = EBIT (1 - t)$$

	Year 1	Year 2	Year 3	Year 4



<b>Revenue</b>	9000.00	10800.00	12960.00	13996.80
Less : COGS	3600.00	4320.00	5184.00	5598.72
Less : Operating Expenses	1980.00	2376.00	2851.20	3079.30
Less : Depreciation	<u>720.00</u>	<u>864.00</u>	<u>1036.80</u>	<u>1119.74</u>
EBIT	2700.00	3240.00	3888.00	4199.04
Less : Tax (30%)	<u>810.00</u>	<u>972.00</u>	<u>1166.40</u>	<u>1259.71</u>
NOPAT	1890.00	2268.00	2721.60	2939.33

(ii) Net Investment = Capital Spending – Depreciation + Change in Working Capital

	Base	Year 1	Year 2	Year 3	Year 4
Capital Spending – Dep		172.50	198.38	228.13	–
Rev.	7500	9000	10800	12960	13996.80
Working Capital	1875	2250	2700	3240	3499.2
Δ Working Capital		375	450	540	259.2

(iii) FCFF

	Year 1	Year 2	Year 3	Year 4
NOPAT – NI	1342.50	1619.62	1953.47	2680.13

**Stage 1 : Explicit**

Year	FCFF	PV @ 15%
1	1342.50	1167.44
2	1619.62	1224.59
3	1953.47	<u>1284.41</u>
Total		<u>3676.44</u>

Stage 2 : Horizon Stage

$$V_3 = \frac{FCFF_4}{K_c - g} = \frac{2680.13}{0.15 - 0.08} = 38287.57$$

$$V_0 = \frac{38287.57}{(1.15)^3} = \text{Rs. } 25174.08 \text{ Crore}$$

Total Value of Firm

$$= \text{Stage 1} + \text{Stage 2} = 3676.44 + 25,174.70 = \text{Rs. } 28,851.14 \text{ Crores}$$

#### Question 48

May 2014 - Paper – 8 Marks

RST Ltd.'s current financial year's income statement reported its net income as Rs. 25,00,000. The applicable corporate income tax rate is 30%.

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

	Rs.
Debt (Coupon rate = 11%)	40 lakhs
Equity (Share Capital + Reserves & Surplus)	125 lakhs

Invested Capital 165 lakhs

Following data is given to estimate cost of equity capital:

	Rs.
Beta of RST Ltd.	1.36
Risk-free rate i.e. current yield on Govt. bonds	8.5%
Average market risk premium (i.e. Excess of return on market portfolio over risk-free rate)	9%

**Required:**

- Estimate Weighted Average Cost of Capital (WACC) of RST Ltd.; and
- Estimate Economic Value Added (EVA) of RST Ltd

**Solution :**

- WACC

Cost of Equity as per CAPM

$$\begin{aligned}
 k_e &= R_f + \beta(R_M - R_f) \\
 &= 8.5\% + 1.36 \times 9\% \\
 &= 8.5\% + 12.24\% \\
 &= 20.74\%
 \end{aligned}$$

Cost of Debt

$$k_d = 11\%(1 - 0.30) = 7.70\%$$

$$WACC = W_t K_e + W_d K_d = 20.74 \times \frac{125}{165} + 7.70 \times \frac{40}{165} = 17.58\%$$

- Economic Value Added

$$\text{Net Profit After Tax} = 25,00,000$$

Add : Tax (30%)

$$\text{Net Profit Before Tax} = 35,71,429$$

$$\text{Add Interest} = 4,40,000$$

$$\text{EBIT} = 40,11,429$$

$$\text{EVA} = \text{Nopat} - K_c (\text{Amount})$$

$$\text{Nopat} = \text{EBIT} (1 - t) = 40,11,429 (1 - 0.3) = 28,08,000$$

$$K_c (\text{Amount}) = (125,00,000 + 40,00,000) \times 17.58\% = 29,00,700$$

$$\text{EVA} = 28,08,000 - 29,00,700 = - 92,700$$

**Question 49**

Nov 2014 - RTP – Similar to - Question 42 - Nov 2013 RTP

**Question 50**

Nov 2014 – RTP – – Similar to - Question 45 - May 2014 – RTP

**Question 51**

Nov 2014 - Paper – 6 Marks

The valuation of Hansel Limited has been done by an investment analyst. Based on an expected free cash flow of Rs.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 Rs.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 nineteenthths of its book value. What is the correct value of Hansel Ltd?

**Solution :**

$$V_0 = \frac{FCFF_1}{K_c - 1}$$

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

$$K_c = 0.12 \text{ i.e } 12\%$$

Let the weight of the debt be x

Wt of Equity will be (1-x)

$$\begin{aligned} \text{WACC} &= \text{Wt Equity} + \text{Wt Debt} \\ &= 20(1 - x) + 10(x) = 12 \end{aligned}$$

$$X = 0.8 - \text{Weight of Debt}$$

$$\text{Weight of Equity} = 1 - 0.8 = 0.2$$

i.e equity and debt were 20 and 80 respectively (book values),

$$\text{however equity shall be } 20 \times 3 = 60$$

$$\text{and debt shall be } 80 \times 9/10 = 72$$

$$\text{Total} = 132$$

$$\text{New WACC} = 20 (60/132) + 10(72/132) = 14.5455\%$$

$$V_0 = \frac{FCFF_1}{K_c - g} = \frac{54}{0.145455 - 0.09} = \text{Rs.973.76 lakhs.}$$

**Question 52**

**Nov 2014 – Paper (8 Marks)**

The risk free rate of return  $R_f$  is 9 percent. The expected rate of return on the market portfolio  $R_m$  is 13 percent. The expected rate of growth for the dividend of Platinum Ltd. is 7 percent. The last dividend paid on the equity stock of firm A was Rs.2.00. The beta of Platinum Ltd. equity stock is 1.2.

- (i) What is the equilibrium price of the equity stock of Platinum Ltd.?
- (ii) How would the equilibrium price change when
  - The inflation premium increases by 2 percent?
  - The expected growth rate increases by 3 percent?
  - The beta of Platinum Ltd. equity rises to 1.3?

**Solution :**

- (i) Equilibrium price of Equity using CAPM

$$= 9\% + 1.2(13\% - 9\%)$$

$$= 9\% + 4.8\% = 13.8\%$$

$$V_0 = \frac{D_1}{R_e - g} = \frac{2 + 7\%}{0.138 - 0.07} = \text{Rs.31.47}$$

(ii) New Equilibrium price of Equity using CAPM

$$\begin{aligned} R_e &= 9.18\% + 1.3(13\% - 9.18\%) \\ &= 9.18\% + 4.966\% = 14.146\% \end{aligned}$$

$$-R_f = 9(1.02) = 9.18$$

$$g = 7 + 3 = 10\%$$

$$VO = \frac{D1}{R_e - g} = \frac{2 + 10\%}{0.14146 - 0.10} = \text{Rs.}53.06$$

**Question 53****Nov 2014 - Paper – 6 Marks**

An investor is holding 5,000 shares of X Ltd. Current year dividend rate is Rs.3/share. Market price of the share is Rs.40 each. The investor is concerned about several factors which are likely to change during the next financial year as indicated below:

	Current Year	Next Year
Dividend paid/anticipated per share (Rs.)	3	2.5
Risk free rate	12%	10%
Market Risk Premium	5%	4%
Beta Value	1.3	1.4
Expected growth	9%	7%

In view of the above, advise whether the investor should buy, hold or sell the shares.

**Solution :**

	CY	NY
(i) $R_e = R_f + \beta(R_m - R_f)$	$12 + 1.3(5)$ $= 18.5$	$10 + 1.4(4)$ $= 15.6$
(ii) $IV = \frac{D1}{R_e - g}$	$= \frac{3(1.09)}{0.185 - 0.09}$ $= \text{Rs.}34.42/\text{sh}$	$= \frac{2.5(1.07)}{0.156 - 0.07}$ $= \text{Rs.}31.10/\text{sh}$

**2015****Question 54****May 2015 – RTP**

ABC Ltd. has divisions A, B & C. The division C has recently reported on annual operating profit of Rs.20,20,00,000. This figure arrived at after charging Rs.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 Rs.60 crore, but replacement cost of these assets is estimated at Rs. 84 crore.

You are required to compute EVA of the Division C.

**Solution :**

First necessary adjustment of the data as reported by historical accounting system shall be made as follows:

	Rs.
Operating Profit	20,20,00,000
Add: Cost of unutilized Advertisement Expenditures	2,00,00,000
	22,20,00,000

Invested Capital (as per replacement cost) is Rs. 84 crore.

Accordingly, EVA = Operating Profit – (Invested Capital x Cost of Capital)

= Rs. 22,20,00,000 – Rs. 84 crore x 11%

= Rs. 22.2 crore – Rs. 9.24 crore

= Rs. 12.96 crore

### Question 55

May 2015 – RTP

The total market value of the equity share of O.R.E. Company is Rs.60,00,000 and the total value of the debt is Rs.40,00,000. The treasurer estimate that the beta of the stock is currently 1.5 and that the expected risk premium on the market is 10 per cent. The Treasury bill rate is 8 per cent.

#### Required:

- What is the beta of the Company's existing portfolio of assets?
- Estimate the Company's Cost of capital and the discount rate for an expansion of the company's present business.

#### Solution :

- Beta of Company's existing Portfolio

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

$$\beta \text{ Assets} = W_t \beta \text{ Equity} + w_t \beta \text{ Debt}$$

Since  $\beta \text{ Debt}$  is not given to us, we assume it to be Zero

$$\text{Equity} = 60,00,000$$

$$\text{Debt} = 40,00,000$$

$$\text{Total} = 1,00,00,000$$

$$\text{Therefore, } \beta \text{ Assets} = 1.5 \times 60/100 = 0.9$$

- Cost of Capital

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

$$= 8 + 0.09(10) = 17.9$$

### Question 57

Nov 2015 – RTP

Two companies A Ltd. and B Ltd. paid a dividend of Rs. 3.50 per share. Both are anticipating that dividend shall grow @ 8%. The beta of A Ltd. and B Ltd. are 0.95 and 1.42 respectively.

The yield on GOI Bond is 7% and it is expected that stock market index shall increase at annual rate of 13%. You are required to determine:

- Value of share of both companies.
- Why there is a difference in the value of shares of two companies.

- (c) If current market price of share of A Ltd. and B Ltd. are Rs. 74 and Rs. 55 respectively. As an investor what course of action should be followed?

**Solution :**

- (a) First of all we shall compute Cost of Capital ( $K_e$ ) of these companies using CAPM as follows:

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

$$K_e (A) = 7.00\% + (13\% - 7\%)0.95$$

$$= 7.00\% + 5.70\% = 12.7\%$$

$$K_e (B) = 7.00\% + (13\% - 7\%)1.42$$

$$= 7.00\% + 8.52\% = 15.52\%$$

- (b) Value of shares

$$V_a = \frac{D_1}{R_e - g} = \frac{3.5 + 8\%}{0.127 - 0.08} = \text{Rs. } 80.43$$

$$V_b = \frac{D_1}{R_e - g} = \frac{3.5 + 8\%}{0.1552 - 0.08} = \text{Rs. } 50.27$$

- (c) The valuation of share of B Ltd. is lower because systematic risk is higher though both have same growth rate.
- (d) If the price of share of A Ltd. is Rs.74, the share is undervalued and it should be bought. If price of share of B Ltd. is Rs.55, it is overvalued and should not be bought.

**Question 58**

Nov 2015 – RTP - Similar to - Question 17 - Nov 2010 - Paper – 8 Marks

**Question 59**

Nov 2015 – Paper

X Ltd is a shoe manufacturing company. It is all equity financed and has a paid up capital of Rs. 10,00,000 @ 10 per share)

X Ltd. has hired swastika consultants to analyse the future earnings. The report of swastika consultants states as follows :

- (i) The earnings and dividend will grow at 25% for next two years
- (ii) Earnings are likely to grow at the rate of 10% from 3<sup>rd</sup> year and onwards
- (iii) Further, if there is reduction in earnings growth, dividend payout ratio will increase to 50%

The other data related to the company are as follows

Year	EPS (Rs.)	Dividend Per share (Rs.)	Share Price (Rs.)
2010	6.30	2.52	63.00
2011	7.00	2.80	46.00
2012	7.70	3.08	63.75
2013	8.40	3.36	68.75
2014	9.60	3.84	93.00

You may assume that the tax rate is 30% (not expected to change in future) and post tax cost of capital is 15%

By using the Dividend Valuation Model, Calculate

- (i) Expected Market Price per share  
(ii) P.E. Ratio

**Solution :**

(a) The formula for the Dividend valuation Model is

$$IV = \frac{D_1}{K_e - g}$$

$K_e$  = Cost of Capital

$g$  = Growth rate

$D_1$  = Dividend at the end of year 1

**Stage 1 : Explicit Stage**

On the basis of the information given, the following projection can be made:

Year	EPS (Rs.)	DPS (Rs.)	PV of DPS @15%
2015	12.00 (9.60 x 125%)	4.80 (3.84 x 125%)	4.176
2016	15.00 (12.00 x 125%)	6.00 (4.80 x 125%)	4.536
2017	16.50 (15.00 x 110%)	8.25* (50% of Rs. 16.50)	5.429
			14.141

\*Payout Ratio changed to 50%.

**Stage 2 : Horizon**

After 2017, the perpetuity value assuming 10% constant annual growth is:

$$D_4 = \text{Rs. } 8.25 \times 110\% = \text{Rs. } 9.075$$

$$IV_3 = \frac{D_4}{K_e - g} = \frac{9.075}{0.15 - 0.10} = 181.50$$

$$IV_0 = \frac{181.50}{(1.15)^3} = 119.43$$

$$\text{Total IV} = \text{Stage 1} + \text{Stage 2} = 14.141 + 119.43 = 133.57$$

**Question 60**

May 2016 – RTP

Following Financial data are available for PQR Ltd. for the year 2008:

	(Rs. in lakh)
8% Debentures	125
10% Bonds	50
Equity Shares (Rs.10 each)	100
Reserves and Surplus	300
Total Assets	600
Assets Turnover ratio	1:1
Effective interest rate	8%
Effective tax rate	40%

Operating margin	10%
Dividend payout ratio	16.67%
Current market Price of Share	Rs.14
Required rate of return of investors	15%

You are required to:

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

### Solution :

- (i) Income Statement

	(Rs. in lakh)
Sale (600 × 1.1)	660
Operating Expense	<u>594</u>
EBIT (10%)	66
Interest (125 + 50) × 8%	<u>14</u>
EBT	52
Tax @ 40%	<u>20.80</u>
EAT	31.20
Dividend @ 16.67%	<u>5.20</u>
<b>Retained Earnings</b>	<b>26.00</b>

- (ii)  $G = br$

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

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

$$\text{Retention Ratio} = 100 - 16.67 = 83.33$$

$$G = 83.33 \times 7.8\% = 6.5\%$$

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

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

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

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

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

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



**Question 61**

May 2016 – Paper

Calculate the value of share of Avenger Ltd. from the following information:

Equity capital of Company	Rs.1,200 crores
Profit of the company	Rs.300 crore
Par value of share	Rs.40 each
Debt ratio of company	25
Long run growth rate of the company	8%
Beta 0.1; risk free interest rate	8.7%
Market returns	10.3%
Change in working capital per share	Rs.4
Depreciation per share	Rs.40
Capital expenditure per share	Rs.48

**Solution :**

$$\text{No. of shares} = \frac{\text{Rs.1200 crore}}{\text{Rs.40}} = 30 \text{ crore}$$

$$\text{EPS} = \frac{\text{PAT}}{\text{No. of shares}} = \frac{\text{Rs.300 crore}}{30 \text{ crore}} = \text{Rs.10.00}$$

$$\begin{aligned} \text{NI} &= [\text{Cap. Spending} - \text{Dep.}] + \Delta\text{WC} (1 - \text{Debt.}) \\ &= [(48 - 40) + 4] (1 - 0.25) = 9 \\ &= \text{PAT} - \text{NU} \\ &= 10 - 9 \\ &= 1.00 \end{aligned}$$

$$\begin{aligned} \text{Cost of Equity} &= R_f + \beta(R_m - R_f) \\ &= 8.7 + 0.1(10.3 - 8.7) \\ &= 8.86\% \end{aligned}$$

$$P_0 = \frac{\text{FCFE}(1+g)}{K_e - g} = \frac{1.00(1.08)}{0.0886 - 0.08} = \frac{1.08}{0.0086} = \text{Rs.125.58}$$

**Question 62**

May 2016 – Paper

XYZ Ltd. paid a dividend of 2 for the current year. The dividend is expected to grow at 40% for the next 5 years and at 15% per annum thereafter. The return on 182 days T-bills is 11% per annum and the market return is expected to be around 18% with a variance of 24%.

The co-variance of XYZ's return with that of the market is 30%. You are required to calculate the required rate of return and intrinsic value of the stock.

**Solution :**

$$\beta = \frac{\text{Covariance of Market return and Security return}}{\text{Variance of Market return}}$$

$$\beta = \frac{30\%}{24\%} = 1.25$$

$$\begin{aligned}
 \text{Expected return} &= R_f + \beta(R_m - R_f) \\
 &= 11\% + 1.25(18\% - 11\%) \\
 &= 11\% + 8.75\% \\
 &= 19.75\%
 \end{aligned}$$

Intrinsic Value

Year	Dividend (Rs.)	Present Value (Rs.)
1	2.80	2.34
2	3.92	2.73
3	5.49	3.19
4	7.68	3.73
5	10.76	4.37
		16.36

$$IV_5 = \frac{10.76(1.15)}{0.1975 - 0.15} = \text{Rs.}260.51$$

$$IV_0 = \frac{260.51}{(1.1975)^5} = 105.79$$

$$\begin{aligned}
 \text{Intrinsic Value} &= \text{Rs.}16.36 + \text{Rs.}105.79 \\
 &= \text{Rs.}122.15
 \end{aligned}$$

### Question 63

May 2016 – Paper

Abinash is holding 5,000 shares of Future Group Limited. Presently the rate of dividend being paid by the company is Rs.5 per share and the share is being sold at Rs.50 per share in the market. However, several factors are likely to change during the course of the year as indicated below:

	Existing	Revised
Risk free rate	12.5%	10%
Market risk premium	6%	4.8%
Expected growth rate	5%	8%
Beta value	1.5	1.25

In view of the above factors whether Abinash should buy, hold or sell the shares? Narrate the reason for the decision to be taken.

### Solution :

Cost of Equity as per CAPM  
 $= R_f + \beta(R_m - R_f)$

$$\begin{aligned}
 \text{Existing rate of return} &= 12.5\% + 1.5 \times 6\% &= 21.5\% \\
 \text{Revised rate of return} &= 10.0\% + 1.25 \times 4.80\% &= 16.00\%
 \end{aligned}$$

Price of share (Original)

$$P_0 = \frac{D_1}{K_e - g} \text{ or } \frac{D_0(1+g)}{K_e - g}$$

$$= \frac{5(1.05)}{0.215 - 0.05} = \frac{5.25}{0.165} = \text{Rs.31.82}$$

P0 Price of share (Revised)

$$= \frac{5(1.08)}{0.16 - 0.08} = \frac{5.40}{0.08} = \text{Rs.67.50}$$

**Question 64****May 2016 – Paper**

Kanpur Shoe Ltd. is having sluggish sales during the last few years resulting in drastic fall in market share and profit. The marketing consultant has drawn out a new marketing strategy that will be valid for next four years. If the new strategy is adopted, it is expected that sales will grow @ 20% per year over the previous year for the coming two years and @ 30% from the third year. Other parameters like gross profit margin, asset turnover ratio, the capital structure and the rate of Income tax @ 30% will remain unchanged. Depreciation would be 10% of the net fixed assets at the beginning of the year. The targeted return of the company is 15%.

The financials of the company for the just concluded financial year 2015-16 are given below:

Income Statement	Amount (Rs.)
Turnover	2,00,000
Gross margin (20%)	40,000
Admin, Selling & Distribution expense (10%)	20,000
PBT	20,000
Tax (30%)	6,000
PAT	14,000

Balance Sheet Information	
Fixed Assets	80,000
Current Assets	40,000
Equity Share Capital	1,20,000

You are required to assess the incremental value that will accrue subsequent to the adoption of the new marketing strategy and advise the Board accordingly.

PV @ 15% for 1, 2 & 3 years are: 0.870, 0.756, 0.658 respectively.

**Solution :****1) Value of firm before strategy**

$$V_f = \frac{\text{PAT(FCFE)}}{R_e} = \frac{14000}{0.15} = 93,333.33$$

**2) Value of firm after strategy****A) Stage 1**

Year	1	2	3	4
FCFE	16800	20160	26208	34070.4

PAT	(14000 + 20%)		(20160 + 30%)	
- NI	24000	28800	51840	67392
	(120000 × 1.2)		(120000 × 1.2 × 1.2 × 1.3 – 172800)	(51840 × 1.3)
FCFE	(7200)	(8640)	(25632)	(33,321.6)
PV @ 15%	(6260.87)	(6533.08)	(16853.46)	(19051.73)

Total = (48,699.14)

B) Stage 2

$$Vf_4 = \frac{FCFE_5(PAT)}{Re} = \frac{34070.4}{0.15} = 227136$$

$$Vf_0 = \frac{227136}{(1.15)^4} = 129865.75$$

Total = 129865.75 – 48699.14 = 81,166.61

3) Value of strategy

= Value of firm after strategy = 81166.61

= Value of firm before strategy = 93333.33

– 12166.72

Note : Since value of strategy is negative it should not be implemented.

### Question 65

Nov 2016 – Paper

XN Ltd. reported a profit of Rs.100.32 lakhs after 34% tax for the financial Year 2015- 2016. An analysis of the accounts reveals that the income included extraordinary items of Rs.14 lakhs and an extraordinary loss of Rs.5 lakhs. The existing operations, except for the extraordinary items, are expected to continue in future. Further, a new product is launched and the expectations are as under:

Particulars	Amount Rs. in lakhs
Sales	70
Material Costs	20
Labour Costs	16
Fixed Costs	10

The company has 50,00,000 Equity Shares of ` 10 each and 80,000, 9% Preference Shares of Rs.100 each with P/E Ratio being 6 times.

You are required to:

- Compute the value of the business. Assume cost of capital to be 12% (after tax) and
- Determine the market price per equity share.

### Solution :

i. Computation of Business Value

	(Rs.in lakhs)
Profit before tax $\frac{100.32}{1-0.34}$	152

Less: Extraordinary income		(14)
Add: Extraordinary losses		5
		<b>143</b>
Profit from new product		
Sales	70	
Less: Material costs	20	
Labour cost	16	
Fixed costs	10	(46)
		<b>24</b>
		<b>167.00</b>
Less: Taxes @34%		58.78
Future Maintainable profits after taxes		<b>110.22</b>
Relevant Capitalization Factor		0.12
Value of Business (Rs.110.22/22)		<b>918.50</b>

ii. **Determination of Market Price of Equity Share**

Future maintainable profits (After tax)		1,10,22,000
Less: Preference share dividends 80,000 shares of Rs.100 @ 9%		7,20,000
Earnings available for Equity Shareholders		1,03,02,000
No. of Equity Shares		50,00,000
Earnings per share = $\frac{1,03,02,000}{50,00,000}$		2.06
PE Ratio		6
Market price per share		12.36

**Question 66**

May 2017 – RTP

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	Rs.
Sales	20,000
Gross Margin (200%)	4,000
Administration, Selling & Distribution expenses (10%)	2,000
PBT	2,000
Tax (30%)	6000
PAT	1,400
Balance Sheet Information	
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. 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.

### Solutions :

#### 1) Value of firm before the strategy

$$V_f = \frac{FCFE(PAT)}{R_e} = \frac{1400}{15\%} = 9333.33$$

#### 2) Value of firm after strategy

##### a) Stage 1

Year	1	2	3	4
FCFE	16800	20160	26208	34070.4
PAT	(14000 + 20%)		(20160 + 30%)	
- NI	24000	28800	51840	67392
	(120000 × 20%)	(2400 + 20%)		
	(720)	(864)	(1036.8)	(1244.16)
PV @ 15%	(626.09)	(653.31)	(681.71)	(711.35)

$$\text{Total} = (2672.46)$$

##### b) Stage 2

$$IV_4 = \frac{FCFE(PAT)_5}{R_e} = \frac{2903.04}{0.15} = 19353.6$$

$$IV_0 = \frac{19353.6}{(1.15)^4} = 11065.48$$

$$\text{Total IV} = 11065.48 - 2672.46 = 8393.02$$

#### 3) Value of strategy

$$= \text{Value of firm after strategy} = 8393.02$$

$$= \text{Value of firm before strategy} = \underline{9333.33}$$

$$-940.31$$

**Note :** Since the value of strategy is negative the firm should not go ahead with strategy.

### Question 67

May 2017 – RTP

Capital structure of Sun Ltd., as at 31.3.2003 was as under:

	(Rs. in lakhs)
Equity share capital	80
8% Preference share capital	40
12% Debentures	64
Reserves	32

Sun Ltd., earns a profit of Rs.32 lakhs annually on an average before deduction of income-tax, which works out to 35% and interest on debentures.

Normal return on equity shares of companies similarly placed is 9.6% provided.

- Profit after tax covers fixed interest and fixed dividends at least 3 times
- Capital gearing ratio is 0.75
- Yield on share is calculated at 50% of profits distributed and at 5% on undistributed profits.

Sun Ltd., has been regularly paying equity dividend of 8%.

Compute the value per equity share of the capital.

### Solution :

#### a) Calculation of Profit after tax (PAT)

	Rs.
Profit before interest and tax (PBIT)	32,00,000
Less: Debenture interest (Rs.64,00,000 x 12/100)	<u>7,68,000</u>
Profit before tax (PBT)	24,32,000
Less: Tax @ 35%	<u>8,51,200</u>
Profit after tax (PAT)	15,80,800
Less: Preference Dividend (Rs.40,00,000 x 8/100)	3,20,000
Equity Dividend (Rs.80,00,000 x 8/100)	<u>6,40,000</u>
Retained earnings (Undistributed profit)	<u>6,20,000</u>

Calculation of Interest and Fixed Dividend Coverage

$$= \frac{\text{PAT} + \text{Debenture interest}}{\text{Debenture interest} + \text{Preference dividend}}$$

$$= \frac{15,80,800 + 7,68,000}{7,68,000 + 3,20,000} = \frac{23,48,000}{10,88,000} = 2.16 \text{ times}$$

#### b) Calculation of Capital Gearing Ratio

$$\text{Capital Gearing Ratio} = \frac{\text{Fixed interest bearing funds}}{\text{Equity shareholder's funds}}$$

$$= \frac{\text{Preference share capital} + \text{Debentures}}{\text{Equity share capital} + \text{Reserves}} = \frac{40,00,000 + 64,00,000}{80,00,000 + 32,00,000}$$

$$= \frac{1,04,00,000}{1,12,00,000} = 0.93$$

#### c) Calculation of Yield on Equity Shares:

Yield on equity shares is calculated at 50% of profits distributed and 5% on undistributed profits:

	(Rs.)
50% on distributed profits (Rs. 6,40,000 × 50/100)	3,20,000
5% on undistributed profits (Rs. 6,20,800 × 5/100)	31,040
Yield on equity shares	3,51,040

$$\text{Yield on equity shares\%} = \frac{\text{Yield on shares}}{\text{Equity share capital}} \times 100$$

$$= \frac{3,51,040}{80,00,000} \times 100 = 4.39\% \text{ or } 4.388\%$$

### Calculation of Expected Yield on Equity shares

**Note:** There is a scope for assumptions regarding the rates (in terms of percentage for every one time of difference between Sun Ltd. and Industry Average) of risk premium involved with respect to Interest and Fixed Dividend Coverage and Capital Gearing Ratio. The below solution has been worked out by assuming the risk premium as:

- (i) 1% for every one time of difference for Interest and Fixed Dividend Coverage.  
 (ii) 2% for every one time of difference for Capital Gearing Ratio.  
 (a) Interest and fixed dividend coverage of Sun Ltd. is 2.16 times but the industry average is 3 times. Therefore, risk premium is added to Sun Ltd. Shares @ 1% for every 1 time of difference.

$$\text{Risk Premium} = 3.00 - 2.16 (1\%) = 0.84 (1\%) = 0.84\%$$

- (b) Capital Gearing ratio of Sun Ltd. is 0.93 but the industry average is 0.75 times. Therefore, risk premium is added to Sun Ltd. shares @ 2% for every 1 time of difference.

$$\begin{aligned} \text{Risk Premium} &= (0.75 - 0.93) (2\%) \\ &= 0.18 (2\%) = 0.36\% \end{aligned}$$

	%
Normal return expected	9.60
Add: Risk premium for low interest and fixed dividend coverage	0.84
Add: Risk premium for high interest gearing ratio	0.36
	10.80

Value of Equity Share

$$= \frac{\text{Actual Yield}}{\text{Expected Yield}} \times \text{Paid-up value of share} = \frac{4.39}{10.80} \times 100 = \text{Rs.40.65}$$

### Question 68

May 2017 – RTP

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

Days	Date	Day	Sensex
1	6	THU	14522
2	7	FRI	15925
3	8	SAT	No Trading
4	9	SUN	No Trading
5	10	MON	15222
6	11	TUE	16000



7	12	WED	16400
8	13	THU	17000
9	14	FRI	No Trading
10	15	SAT	No Trading
11	16	SUN	No Trading
12	17	MON	18000

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

**Solutions :**

Date	1 Sensex	2 EMA for Previous day	3 1 - 2	4 3 x 0.062	5 EMA 2 + 4
6	14522	15000	(478)	(29.636)	14970.364
7	14925	14970.364	(45.364)	(2.812)	14967.55
10	15222	14967.55	254.45	15.776	14983.32
11	16000	14983.32	1016.68	63.034	15046.354
12	16400	15046.354	1353.646	83.926	15130.28
13	17000	15130.28	1869.72	115.922	15246.202
17	18000	15246.202	2753.798	170.735	15416.937

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

**Question 69**

May 2017 – RTP

Sunrise Limited last year paid dividend of Rs.20 per share with an annual growth rate of 9%. The risk-free rate is 11% and the market rate of return is 15%. The company has a beta factor of 1.50. However, due to the decision of the Board of Director to grow inorganically in the recent past beta is likely to increase to 1.75.

You are required to find out under Capital Asset Pricing Model

- The present value of the share
- The likely value of the share after the decision.

**Solution :**

The value of Cost of Equity with the help of CAPM

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

With the given data the Cost of Equity using CAPM will be:

$$K_e = 0.11 + 1.5(0.15 - 0.11)$$

$$K_e = 0.11 + 1.5(0.04)$$

$$= 0.17 \text{ or } 17\%$$

The value of share using the Growth Model:

$$P = \frac{D_0 (1+g)}{K_e - g}$$

$$P = \frac{20(1+0.09)}{0.17-0.09}$$

$$P = \frac{21.80}{0.08} = \text{Rs.}272.50$$

However, if the decision of the Board of Directors is implemented, the beta factor is likely to increase to 1.75.

Therefore,

$$K_e = 0.11 + 1.75(0.15 - 0.11)$$

$$K_e = 0.11 + 1.75(0.04)$$

$$= 18\%$$

The value of share using the Growth Model:

$$P = \frac{D_0 (1+g)}{K_e - g}$$

$$P = \frac{20(1+0.09)}{0.18-0.09}$$

$$P = \frac{21.80}{0.09} = \text{Rs.}242.22$$

### Question 70

May 2017 – RTP

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

Liabilities	Rs. (in lakhs)	Assets	Rs. (in lakhs)
Share capital (share of Rs.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
<b>Total</b>	<b>170</b>	<b>Total</b>	<b>170</b>

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 Rs.64 lakhs includes Rs.4 lakhs extraordinary income and Rs.1 lakh income from investments of surplus funds; such surplus funds are unlikely to recur.

- (ii) In subsequent years, additional advertisement expenses of Rs.5 lakhs are expected to be incurred each year.
- (iii) Market value of Land and Building and Plant and Machinery have been ascertained at Rs.96 lakhs and Rs.100 lakhs respectively. This will entail additional depreciation of Rs.6 lakhs each year.
- (iv) Effective Income-tax rate is 30%.
- (v) The capitalization rate applicable to similar businesses is 15%.

**Solution :**

	Rs.in Lakhs
<b>Net Assets Method</b>	
Assets: Land & Buildings	96
Plant & Machinery	100
Investments	10
Stocks	20
Debtors	15
Cash & Bank	<u>5</u>
Total Assets	246
Less: Long Term Debts	<u>30</u>
<b>Net Assets</b>	<b><u>216</u></b>

**Value per share**

- (i) Number of shares  $\frac{1,00,00,000}{10} = 10,00,000$
- (ii) Net Assets Rs.2,16,00,000  
 $\frac{Rs.2,16,00,000}{10,00,000} = Rs.21.6$

<b>Profit – Earning Capacity Method</b>	Rs.in lakhs	
Profit before tax		64.00
Less : Extraordinary income	4.00	
Investment income (not likely to recur)	<u>1.00</u>	<u>5.00</u>
		59.00
Less : Additional expenses in forthcoming years		
Advertisement	5.00	
Depreciation	<u>6.00</u>	<u>11.00</u>
Expected earnings before taxes		48.00
Less: Income - tax @ 30%		<u>14.40</u>
<b>Future maintainable profits (after taxes)</b>		<b>33.60</b>

Value of business

$$\begin{array}{rcl} \text{Capitalisation factor} & = \frac{33.60}{0.15} = & 224 \\ \text{Less : Long Term Debts} & & \underline{30} \\ & & 194 \end{array}$$

**Value per share**

$$\frac{1,94,00,000}{10,00,000} = \text{Rs.19.40}$$

Fair Price of share	Rs.
Value as per Net Assets Method	21.60
Value as per Profit earning capacity (Capitalisation) method	19.40
Fair Price = $\frac{21.60+19.40}{2} = \frac{41.00}{2} =$	Rs.20.50

**Question 71**

May 2017 – Paper

The Following is the Balance Sheet of XYZ Ltd. as at 31<sup>st</sup> March, 2016:

Liabilities	Rs.in lakhs	Assets	Rs.in lakhs
Equity Shares of Rs.10 each	500	Land and Buildings	150
11% Preference Shares of Rs.10 each	100	Plant and Machinery	200
12% Debentures	100	Furniture and Fixtures	60
Debenture Interest Accrued and Payable	12	Inventory	60
Loan from Bank	60	Sundry debtors	50
Trade Creditors	300	Cash at bank	50
		Preliminary expense	15
		Cost of issue of debentures	7
		Profit and loss account	480
<b>Total</b>	<b>1,072</b>	<b>Total</b>	<b>1,072</b>

The Company's performance is not good and has suffered sizable losses during the last few years. The Company can be nursed back to health with proper financial restructuring.

As such, the following scheme is prepared:

- Equity Shares are to be reduced to 2 per Share, fully paid-up.
- Preference Shares are to be reduced (with coupon Rate of 9%) to equal number of Shares of Rs.5 each, fully paid-up.
- Debenture holders have agreed to forgo the accrued interest due to them and for the future the rate of interest on Debentures to be 10%.
- Trade Creditors will forgo 20% of the amount due to them.
- The Company to issue 50 Lakh Shares at Rs.2 each to be paid fully on Application.
- The entire amount is fully subscribed by Promoters.

- vii. Land and Building to be revalued at Rs.350 Lakhs, Plant and Machinery value to be taken at Rs.150 Lakhs and a provision of Rs.5 Lakhs to be made for Bad and Doubtful Debts.

**You are required to:**

- 1) Show the impact of Financial Restructuring on the Company's activities.
- 2) Prepare the fresh Balance Sheet after the reconstruction is completed on the basis of above proposals.

**Solution :**

Impact of Financial Restructuring

- i. Benefits of Grape XYZ Ltd.

	Rs.in lakhs
(a) Reduction of liabilities payable	
Reduction in equity share capital (50 lakh shares x Rs.8 per share)	400
Reduction in preference share capital (10 lakh shares x Rs.5 per share)	50
Waiver of outstanding debenture interest	12
Waiver from trade creditors (Rs.300 lakhs x 0.20)	60
	<b>522</b>
(b) Revaluation of Assets	
Appreciation of Land & Building (350 - 150)	200
<b>Total (A)</b>	<b>722</b>

- ii. Amount of Rs.722 lakhs utilized to write off losses, fictitious assets and over-valued assets.

	Rs.in lakhs
Writing off profit and loss account	480
Cost of issue of debentures	7
Preliminary expenses	15
Provision for bad and doubtful debts	5
Revaluation of Plant and Machinery (200 - 150)	50
<b>Total (B)</b>	<b>557</b>
Capital Reserve (A) – (B)	<b>165</b>

- iii. Balance Sheet of XYZ Ltd. as at 31<sup>st</sup> March 2016 (after re-construction)

Liabilities	Rs.in lakhs	Assets	Rs.in lakhs
100 lakhs equity shares of Rs.2 each	200	Land and Buildings	350
9% Preference Shares of Rs.5 each	50	Plant and Machinery	150
Capital Reserve	165	Furniture and Fixtures	60

10% Debenture	100	Inventory	60
Loan from Bank	60	Sundry debtors 50	
		Less: Provision for Doubtful Debt (5)	45
Trade Creditors (300 - 60)	240	Cash at bank (Balancing figure)*	150
<b>Total</b>	<b>815</b>	<b>Total</b>	<b>815</b>

Balance Sheet Total

\*Opening Balance of Rs.50/- Lakhs + Sale proceeds from issue of new equity shares Rs.100/- lakhs.

### Question 72

Nov 2017 – RTP

T Ltd. Recently made a profit of Rs.50 crore and paid out Rs.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 Rs.225 crore and number of shares is 10 crore. In case company is liquidated, building would fetch Rs.100 crore more than book value and stock would realize Rs.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 valuation of T Ltd. using

- (i) P/E Ratio
- (ii) Dividend Yield
- (iii) Valuation as per:
  - a) Dividend Growth Model
  - b) Book Value
  - c) Net Realizable Value

### Solution :

- (i) Rs.50 crore x 9 = Rs.450 crore
- (ii) Rs.50 crore x  $\frac{0.80}{0.06}$  = Rs.666.70  
= 0.060.80
- (iii) (a)  $K_e = 6\% + 1.2 (11\% - 6\%) = 12\%$   
Value of firm =  $\frac{40 \text{ crore} \times 1.04}{0.12 - 0.04} = \text{Rs.520 crore}$
- (b) Rs.225 crore
- (c) Rs.225 crore + Rs.100 crore – Rs.25 crore = 300 crore

### Question 73

Nov 2017 – Paper

Sea Rock Ltd. has an excess cash of Rs.30,00,000 which it wants to invest in short-term marketable securities.

- (i) Expenses resulting to investment will be Rs.45,000. The securities invested will have an annual yield of 10%. The company seeks your advice as to the period of investment so as to earn a pre-tax income of 6%.
- (ii) Also find the minimum period for the company to break-even its investment expenditure. Ignore time value of money

**Solution :**

- (i) Pre-tax Income required on investment of Rs.30,00,000 is Rs.1,80,000.  
Let the period of Investment be 'P' and return required on investment Rs.1,80,000  
(Rs.30,00,000 x 6%)

Accordingly,

$$(Rs.30,00,000 \times \frac{10}{100} \times \frac{P}{12}) - Rs.45,000 = Rs.1,80,000$$

$$P = 9 \text{ months}$$

- (ii) Break-Even its investment expenditure  
(Rs.30,00,000 x  $\frac{10}{100} \times \frac{P}{12}$ ) - Rs.45,000 = 0  
P = 1.80 months

**Question 74**

May 2018 – RTP

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

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

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

**Solution :**

$$\begin{aligned} \text{Value of share at present} &= \frac{D_1}{K_e - g} \\ &= \frac{2(1.06)}{0.08 - 0.06} = Rs.106 \end{aligned}$$

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

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

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

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

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

10 shares in 1<sup>st</sup> year @ Rs.214.33 for Rs.2,143.30

9 shares in 1<sup>st</sup> year @ Rs.231.48 for Rs.2,083.32

8 shares in 1<sup>st</sup> year @ Rs.250 for Rs.2,000.00

At the end of 3rd year, he would be having 973 shares valued @ Rs.250 each i.e. Rs.2,43,250. On

these 973 shares, his dividend income for year 4 would be @ Rs.2.50 i.e. Rs.2,432.50.

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

#### Question 75

May 2018 (New) – RTP

BRS Inc deals in computer and IT hardware and peripherals. The expected revenue for the next 8 years is as follows:

Years	Sales Revenue (\$ Million)
1	8
2	10
3	15
4	22
5	30
6	26
7	23
8	20

Summarized financial position as on 31<sup>st</sup> March 2012 was as follows:

Liabilities	Amount	Assets	Amount
Equity Stocks	12	Fixed Assets (Net)	17
12% Bonds	8	Current Assets	3
	20		20

#### Additional Information:

- (a) Its variable expenses is 40% of sales revenue and fixed operating expenses (cash) are estimated to be as follows:



Period	Amount (\$ Million)
1 – 4 Years	1.6
5 – 8 Years	2

- (b) An additional advertisement and sales promotion campaign shall be launched requiring expenditure as per following details:

Period	Amount (\$ Million)
1 Year	0.50
2 – 3 Years	1.50
4 – 6 Years	3.00
7 – 8 Years	1.00

- (c) Fixed assets are subject to depreciation at 15% as per WDV method.  
 (d) The company has planned additional capital expenditures (in the beginning of each year) for the coming 8 years as follows:

Period	Amount (\$ Million)
1	0.50
2	0.80
3	2.00
4	2.50
5	3.50
6	2.50
7	1.50
8	1.00

- (e) Investment in Working Capital is estimated to be 20% of Revenue.  
 (f) Applicable tax rate for the company is 30%.  
 (g) Cost of Equity is estimated to be 16%.  
 (h) The Free Cash Flow of the firm is expected to grow at 5% per annum after 8 years.

**CALCULATE:**

- (i) Value of Firm  
 (ii) Value of Equity

**Solution :**

**1) Working note for depreciation**

	Year	1	2	3	4	5	6	7	8
Assets	Op.	17	14.875	13.15375	12.881	13.074	14.088	14.1	13.26
+ Cap.sp.		0.5	0.6	2	2.5	3.5	2.5	1.5	1
Assets		17.5	15.475	15.15375	15.381	16.57	16.588	15.6	14.26
- Dep.		2.625	2.32125	2.273	2.3071	2.486	2.488	2.34	2.139
Assets Clo.		14.875	13.15375	12.881	13.074	14.088	14.1	13.26	12.121

- 2)  $K_c = 16\%$   
 $K_d = i(1 - t)$

$$\begin{aligned}
 &= 12(1 - 0.3) \\
 &= 8.4\% \\
 \text{WACC} &= \frac{12}{20} \times 16\% + \frac{8}{20} \times 8.4\% \\
 &= 12.96\%
 \end{aligned}$$

## 3) Calculation for NOPAT

Year	1	2	3	4	5	6	7	8
Sales	8	10	15	22	30	26	23	20
VC	3.2	4	6	8.8	12	10.4	9.2	8
FC	1.6	1.6	1.6	1.6	2	2	2	2
Adv.	0.5	1.5	1.5	3	3	3	1	1
Dep.	2.625	2.32125	2.2730	2.3071	2.4860	2.488	2.34	2.139
EBIT	0.075	0.58	3.627	6.2929	10.514	8.112	8.46	6.861
tax (30%)								
NOPAT	0.0525	0.411	2.538	4.405	7.359	5.678	5.922	4.8027

## 4) Calculation for Net Investments

Year	1	2	3	4	5	6	7	8
Cap. Sp.	0.5	0.6	2	2.5	3.5	2.5	1.5	1
-Dep.	2.625	2.32125	2.273	2.3071	2.4860	2.488	2.34	2.139
	(2.125)	(1.72125)	(0.2730)	0.1929	1.012	0.01	(0.84)	(1.139)
+ΔWC	1.6	2	3	4.4	6	5.2	4.6	4
NI	(0.525)	0.27875	(2.727)	(4.5929)	7.014	5.212	3.76	2.861

## 5) FCFF

Year	1	2	3	4	5	6	7	8
(NOPAT – NI)	0.5775	0.13225	(0.189)	(0.1879)	0.345	0.466	2.162	1.9417
PV @ 12.96%	0.511	0.1036	(0.131)	(0.115)	0.188	0.224	0.921	0.732

$$\begin{aligned}
 \text{6) } V_8 &= \frac{\text{FCFF}_9}{K_c - g} \\
 &= \frac{1.9417(1.05)}{0.1296 - 0.05} \\
 &= 25.612 \\
 V_0 (\text{Stage 2}) &= \frac{25.612}{(1.1296)^8} = 9.66
 \end{aligned}$$

$$\begin{aligned}
 7) \quad \text{Value of firm} &= \text{Stage I} + \text{Stage II} \\
 &= 2.4336 \\
 &= 2.4336 + 9.66 \\
 &= 12.09 \\
 \text{Value of equity} &= \text{Value of Firm} - \text{Value of Debt} \\
 &= 12.09 - 8 \\
 &= 4.09
 \end{aligned}$$

**Question 76****May 2018 (New) – Paper – 5 Marks**

Herbal World 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 Rs.18.5 lakh after tax, mainly on the strength of its patented beauty cream to remove the pimples.

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

**Solution :**

**EVA = NOPATA – WACC x Capital Employed.**

Capital Employed	Rs.lacs
Property, etc.	50
Working Capital	25
Patent Value	50
<b>Effective or Invested Capital</b>	<b>125</b>

WACC x CE = 14% x Rs.125 lacs = Rs.17.5 lacs

EVA = Rs.18.5 lacs – Rs.17.5 lacs = Rs.1 lac

**Question 77****May 2018 (New) – Paper – 8 Marks**

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 Rs.5,000 lakhs, based on the expected free cash flow for next year of Rs.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.

**Solution :**

$$\text{Value of the Company} = \frac{\text{FCFF}_1}{K_c - g},$$

$$5000 = \frac{200}{K_c - 0.05}$$

$$K_c = 9\%$$

We do not know the weights the analyst had taken for arriving at the cost of capital. Let  $w$  be the proportion of equity. Then,  $(1-w)$  will be the proportion of debt.

$$K_c = 9 = w \times 12 + (1-w) \times 6$$

$$9 = 6 + 6w$$

$$6w = 3$$

$$\text{Hence } w = 3/6 = 0.5 = 50\% \text{ or } 1:1$$

The weights are equal i.e. 1:1 for equity and debt.

The correct weights should be market value of equity : market value of debts.

i.e. 4 times book value of equity : book value of debts. i.e. 4:1 equity : debt

$$\text{Revised } K_c = 4/5 \times 12 + 1/5 \times 6 = 10.8\%$$

$$\text{Revised value of the company} = \frac{200}{10.8 - 5} = 200 / 5.8\% = 3448.28 \text{ lacs.}$$

### Question 78 May 2018 (New) – Paper – Similar to - Question 68 - May 2017 – RTP

### Question 79 May 2018 (New) – Paper – 4 Marks

The risk free rate of return is 5 percent. The expected rate of return on the market portfolio is 11 percent. The expected rate of growth in dividend of X Ltd. is 8 percent. The last dividend paid was Rs.2.00 per share. The beta of X Ltd. equity stock is 1.5

- (i) What is the present price of the equity stock of X Ltd.?
- (ii) How would the price change when
  - The inflation premium increases by 3 percent?
  - The expected growth rate decreases by 3 percent?
  - The beta decreases to 1.3?

#### Solution :

- (i) Present Price of Stock

$$\begin{aligned} R_e &= R_f + \beta(R_m - R_f) \\ &= 5 + 1.5(11 - 5) \\ &= 5 + 9 = 14\% \end{aligned}$$

$$IV = \frac{D_1}{R_e - g} = \frac{2.00(1.08)}{0.14 - 0.08} = \text{Rs.36/share}$$

- (ii) Inflation premium = 3%

$$R_f = 5 \times 1.03 = 5.15\%$$

$$g = 8 - 3 = 5\%$$

$$\beta = 1.3$$

$$R_e = 5.15 + 1.3(11 - 5.15) = 12.755\%$$

$$IV = \frac{D1}{Re - g} = \frac{2.00(1.05)}{0.12755 - 0.05} = \text{Rs.27.81/share}$$

**Question 80****Nov 2018 – RTP**

Pragya Limited has issued 75,000 equity shares of Rs.10 each. The current market price per share is Rs.24. The company has a plan to make a rights issue of one new equity share at a price of Rs.16 for every four share held.

You are required to:

- Calculate the theoretical post-rights price per share;
- Calculate the theoretical value of the right alone;
- Show the effect of the rights issue on the wealth of a shareholder, who has 1,000 shares assuming he sells the entire rights; and
- Show the effect, if the same shareholder does not take any action and ignores the issue.

**Solution :**

- Calculation of theoretical Post-rights (ex-right) price per share:

$$\text{Ex-Right Value} = \left[ \frac{MN+SR}{N+R} \right]$$

Where,

M = Market price,

N = Number of old shares for a right share

S = Subscription price

R = Right share offer

$$= \left[ \frac{(24 \times 4) + (16 \times 1)}{4+1} \right] = \text{Rs.22.40}$$

- Calculation of theoretical value of the rights alone:

= Ex-right price – Cost of rights share

= Rs.22.40 – Rs.16

= Rs.6.40

- Calculation of effect of the rights issue on the wealth of a shareholder who has 1,000 shares assuming he sells the entire rights:

		<b>Rs.</b>
(a)	Value of shares before right issue (1,000 shares × Rs.24)	24,000
(b)	Value of shares after right issue (1,000 shares × Rs.22.40)	22,400
	<i>Add:</i> Sale proceeds of rights renunciation (250 shares × Rs.6.40)	<u>1,600</u>
		<b>24,000</b>

There is no change in the wealth of the shareholder even if he sells his right.

- Calculation of effect if the shareholder does not take any action and ignores the issue:

	Rs.
Value of shares before right issue (1,000 shares × Rs.24)	24,000
Value of shares after right issue (1,000 shares × Rs.22.40)	22,400
Loss of wealth to shareholders, if rights ignored	1,600

**Question 81****Nov 2018 – RTP**

X Limited, just declared a dividend of Rs.14.00 per share. Mr. B is planning to purchase the share of X Limited, anticipating increase in growth rate from 8% to 9%, which will continue for three years. He also expects the market price of this share to be Rs.360.00 after three years.

You are required to determine:

- the maximum amount Mr. B should pay for shares, if he requires a rate of return of 13% per annum.
- the maximum price Mr. B will be willing to pay for share, if he is of the opinion that the 9% growth can be maintained indefinitely and require 13% rate of return per annum.
- the price of share at the end of three years, if 9% growth rate is achieved and assuming other conditions remaining same as in (ii) above.

Calculate rupee amount up to two decimal points.

	Year 1	Year 2	Year 3
FVIF @ 9%	1.090	1.188	1.295
FVIF @ 13%	1.130	1.277	1.443
FVIF @ 13%	0.885	0.783	0.693

**Solution :**

- (i) Expected dividend for next 3 years.

$$\text{Year 1 (D}_1\text{)} \quad \text{Rs.14.00 (1.09)} \quad = \text{Rs.15.26}$$

$$\text{Year 2 (D}_2\text{)} \quad \text{Rs.14.00 (1.09)}^2 \quad = \text{Rs.16.63}$$

$$\text{Year 3 (D}_3\text{)} \quad \text{Rs.14.00 (1.09)}^3 \quad = \text{Rs.18.13}$$

$$\text{Required rate of return} \quad = 13\% (\text{K}_e)$$

$$\text{Market price of share after 3 years} \quad = (\text{P}_3) = \text{Rs.360}$$

The present value of share

$$P_0 = \frac{D_1}{(1+k_e)} + \frac{D_2}{(1+k_e)^2} + \frac{D_3}{(1+k_e)^3} + \frac{P_4}{(1+k_e)^3}$$

$$P_0 = \frac{15.26}{(1+0.13)} + \frac{16.63}{(1+0.13)^2} + \frac{18.13}{(1+0.13)^3} + \frac{360}{(1+0.13)^3}$$

$$P_0 = 15.26(0.885) + 16.63(0.783) + 18.13(0.693) + 360(0.693)$$

$$P_0 = 13.50 + 13.02 + 12.56 + 249.48$$

$$P_0 = \text{Rs.288.56}$$

- (ii) If growth rate 9% is achieved for indefinite period, then maximum price of share should Mr. A willing be to pay is

$$P_0 = \frac{D_1}{(1+k_e)} = \frac{Rs.15.26}{0.13-0.09} = \frac{Rs.15.26}{0.04} = Rs.381.50$$

(iii) Assuming that conditions mentioned above remain same, the price expected after 3 years will be:

$$P_3 = \frac{D_4}{(k_e-g)} = \frac{D_3(1.09)}{0.13-0.09} = \frac{18.13 \times 1.09}{0.04} = \frac{19.76}{0.04} = Rs.494$$

**Question 82****Nov 2018 – Paper – 5 Marks**

Eager Ltd. has a market capitalization of Rs.1,500 crores and the current market price of its share is Rs.1,500. It made a PAT of 200 crores and the Board is considering a proposal to buy back 20% of the shares at a premium of 10% to the current market price. It plans to fund this through a 16% bank loan. You are required to calculate the post buy back Earnings Per Share (EPS). The company's corporate tax rate is 30%

**Solution**

- A. Market Cap 1500  
 B. MPS 1500  
 C. No (Cap/MPS) 1 crore  
 D. No. of shares to be brought back =  $1 \times 0.2 = 0.2$  crore  
 E. Funds needed =  $0.20 \times 1650$  (1500 + 10%) = 330 crore  
 F. Interest post tax =  $330 \times 16\% \times 70\%$  = 36.96  
 G. PAT after buy back =  $200 - 36.96 = 163.04$   
 H.  $EPS = \frac{PAT}{No} = \frac{163.04}{0.8} = Rs.203.80$

**Question 83****Nov 2018 – Paper – 8 Marks**

A company has an EPS of Rs.2.5 for the last year and the DPS of Rs.1. The earnings is expected to grow at 2% a year in long run. Currently it is trading at 7 times its earnings. If required rate of return is 14%, compute the following:

- (i) An estimate of the P/E ratio using Gordon growth model.  
 (ii) The Long term growth rate implied by the current P/E ratio.

**Solution :**

1. PE using Gordon growth

$$IV = \frac{D_1}{R_e - g} = \frac{1(1.02)}{0.14 - 0.02} = 8.5$$

$$PE = \frac{MPS}{EPS} = \frac{8.5}{2.5} = 3.4 \text{ times}$$

2. Current PE = 7 times

$$\therefore MPS = 2.5 \times 7 = 17.5$$

Assuming market is at equilibrium

$$17.5 = \frac{1(1+g)}{0.14-g}$$

$$\begin{aligned} 2.45 - 17.5g &= 1 + 1g \\ 1.45 &= 18.5g \\ \therefore g &= 7.84\% \end{aligned}$$

**Question 84**

Nov 2018 – Paper – 4 Marks

AMKO limited has issued 75,000 equity shares of Rs.10 each. The current market price per share is Rs.36. The company has a plan to make a rights issue of one new equity share at a price of Rs.24 for every four shares held.

You are required to:

- (i) Calculate the theoretical post rights price per share
- (ii) Calculate the theoretical value of the rights alone.

**Solution :**

1. No. of shares to be issued =  $\frac{75000}{4} = 18750$

2. Priced at Rs.24

3. Ex Right Price =  $\frac{(75000 \times 36) + (18750 \times 24)}{75000 + 18750}$   
 $= \frac{27,00,000 + 4,50,000}{93,750} = \text{Rs.}33.6$

4. Value of Right =  $33.6 - 24$   
 $= 9.6$

**Question 85**

Nov 2018 (New) – RTP

ABC Limited's shares are currently selling at Rs.13 per share. There are 10,00,000 shares outstanding. The firm is planning to raise Rs.20 lakhs to Finance a new project.

- (i) CALCULATE the ex-right price of shares and the value of a right, if the firm offers one right share for every two shares held.
- (i) CALCULATE the ex-right price of shares and the value of a right, if the firm offers one right share for every four shares held.
- (ii) ANALYSE how does the shareholders' wealth change from (i) to (ii) above and right issue increases shareholders' wealth?

**Solution :**

- (i) Number of shares to be issued: 5,00,000

$$\text{Subscription price} = \frac{20,00,000}{5,00,000} = 4$$

$$\text{Sh. Price after right} = \frac{1,30,00,000 + 20,00,000}{15,00,000} = 10$$

$$\text{Or} = \text{Rs.}10 - \text{Rs.}4 = \text{Rs.}6$$



$$(ii) \quad \text{Subscription price} \frac{20,00,000}{2,50,000} = \text{Rs.8}$$

$$\text{Ex-right Price} \frac{1,30,00,000 + 20,00,000}{12,50,000} = \text{Rs.12}$$

$$\text{Or} = \text{Rs.12} - \text{Rs.8} = \text{Rs.4}$$

(iii) The effect of right issue on wealth of Shareholder's wealth who is holding, say 100 shares.

(a) When firm offers one share for two shares held.

Value of Shares after right issue (150 × Rs.10)	Rs.1,500
Less: Amount paid to acquire right shares (50 × Rs.4)	Rs.200
	Rs.1,300

(b) When firm offers one share for every four shares held.

Value of Shares after right issue (125 × Rs.20)	Rs.1,500
Less: Amount paid to acquire right shares (25 × Rs.8)	Rs.200
	Rs.1,300

(c) Wealth of Shareholders before Right Issue Rs.1,300

Thus, there will be no change in the wealth of shareholders from (i) and (ii).

### Question 86

Nov 2018 (New) – RTP

Piyush Loonker and Associates presently pay a dividend of Re. 1.00 per share and has a share price of Rs. 20.00.

- CALCULATE the firm's expected or required return on equity using a dividend-discount model approach if this dividend were expected to grow at a rate of 12% per annum forever.
- CALCULATE the firm's expected, or required, return on equity if instead of this situation in part (i), suppose that the dividends were expected to grow at a rate of 20% per annum for 5 years and 10% per year thereafter.

### Solution :

(i) Firm's Expected or Required Return on Equity

$$V = \frac{D_1}{Re - g}$$

$$20 = \frac{1.12}{Re - 0.12}$$

$$\therefore Re = 17.6\%$$

(ii) Firm's Expected or Required Return on Equity

(If dividends were expected to grow at a rate of 20% per annum for 5 years and 10% per year thereafter)

Year	Div	PV @18%
------	-----	---------

1	1.2	1.017
2	1.44	1.034
3	1.728	1.052
4	2.0736	1.07
5	2.488	1.08
		5.261

$$IV_5 = \frac{2.488(1.2)}{0.18 - 0.10} = 37.32$$

$$IV_0 = \frac{37.32}{(1.18)^5} = 16.31$$

$$\begin{aligned} \text{Total} &= 5.261 + 16.31 \\ &= 21.57720 \end{aligned}$$

Since the PV is 720. Lets increase the Re to 20%

Year	Div	PV @20%
1	1.2	1
2	1.44	1
3	1.728	1
4	2.0736	1
5	2.488	1
		5

$$IV_5 = \frac{2.488(1.2)}{0.20 - 0.10} = 29.856$$

$$IV_0 = \frac{29.856}{(1.2)^5} = 12$$

$$\text{Total} = 17 < 20$$

Since PV is > 20. We shall use IRR to calculate Re.

$$K_e = LR + \frac{\text{NPV at LR}}{\text{NPV at LR} - \text{NPV at HR}} \times \Delta r$$

$$K = 18\% + \frac{(\text{Rs.}21.57 - \text{Rs.}20)}{\text{Rs.}21.57 - \text{Rs.}17} \times 2\%$$

$$= 1.57 + 3$$

$$= 18\% + \frac{\text{Rs.}1.57}{\text{Rs.}4.57} \times 2\%$$

$$= 18.69\%$$

Therefore, the firm's expected, or required, return on equity is 18.10%. At this rate the present discounted value of dividend stream is equal to the market price of the share.

### Question 87

Nov 2018 (New) – RTP

Eagle Ltd. reported a profit of Rs.77 lakhs after 30% tax for the financial year 2016-17. An analysis of the accounts revealed that the income included extraordinary items of Rs.8 lakhs and an

extraordinary loss of Rs.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:

	Rs.in lakhs
Sales	70
Material costs	20
Labour costs	12
Fixed costs	10

You are required to:

- (i) CALCULATE the value of the business, given that the capitalization rate is 14%.
- (iii) CALCULATE the market price per equity share, assuming Eagle Ltd.'s share capital being comprised of 1,00,000 13% preference shares of Rs.100 each and 50,00,000 equity shares of Rs.10 each and the P/E ratio being 10 times.

### Solution :

#### (i) Computation of Business Value

		Rs.in lakhs
Profit before tax (77/1-0.30)		110
Less: Extraordinary income		(8)
Add: Extraordinary losses		(10)
		<b>112</b>
Profit from new product	Rs.in lakhs	
Sales	70	
Less: Material costs	20	
Labour costs	12	
Fixed costs	10	
	(42)	<u>28</u>
		<b>140.00</b>
Less: Taxed @ 30%		<u>42.00</u>
Future Maintainable Profits after taxes		<b>98.00</b>
Relevant Capitalisation Factor		0.14
Value of Business (Rs.98/0.14)		700

#### (ii) Computation of Market Price of Equity Share

Future Maintainable profits (After Tax)	Rs.98,00,000
Less: Preference share dividends 1,00,000 shares of Rs.100 @ 13%	Rs.13,00,000
Earnings available for Equity Shareholders	Rs.85,00,000
No. of Equity Shares	50,00,000
Earnings per share = $\frac{\text{Rs.85,00,000}}{50,00,000}$	Rs.1.70
PE ratio	10

Market Price per share

Rs.17

**Question 88**

Nov 2018 (New) – Paper

Shares of Volga Ltd. Are being quoted at a price – earning ratio 8 times. The company retains 50% of its earnings per share. The company's EPS is Rs.10.

You are required to determine

1. Cost of Equity to the company if the market expects a growth rate is 15% p.a.
2. The indicative market price with the same cost of capital and if the anticipated growth rate is 16% p.a
3. The market price per share if the company's cost of capital is 20%p.a and the anticipated growth rate is 18% p.a.

**Solution :**

Dividend = 10 x 50% = Rs.5 / share

MPS = EPS x PE = 10 x 8 = Rs.80 / share

1. Assuming market at Equilibrium MPS = IV

$$IV = \frac{D1}{Re-g}$$

$$80 = \frac{5(1.15)}{Re-0.15}$$

$$80 Re - 12 = 5.75$$

Therefore Re = 22.1875%

2. Market Price with same cost of capital and Growth rate of 16%

$$IV = \frac{D1}{Re-g} = \frac{5(1.16)}{0.221875-0.16} = \text{Rs.93.74 / share}$$

3. Market price of cost of capital is 20% and Growth is 18%.

$$IV = \frac{D1}{Re-g} = \frac{5(1.18)}{0.2-0.18} = \text{Rs.295 / share}$$

**Question 89**

Nov 2018 (New) – Paper

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

<b>Total</b>	<b>16,000</b>
Equity share capital	15,000
Sundry Creditors	1,000
<b>Total</b>	<b>16,000</b>

The company is contemplating for new sales strategy as follows

1. Sales to grow by 30% per year for next 4 years
2. Assets turnover ratio, net profit ratio and tax rate will remain the same
3. Depreciation will be 15% of value of Asset at the beginning of the year
4. Required rate of return for the company is 15%

Evaluate the viability of new strategy

### Solution :

1. Value of firm before strategy

$$VF = \frac{FCFF}{K_e} = \frac{PAT}{K_e} = \frac{4200}{15\%} = \text{Rs.}28,000$$

2. Value of firm after strategy

#### Stage 1

Year	1	2	3	4	5
PAT	5460	7098	9227.4	11995.62	11995.62
- NI (Δ in capital Employed)	4500	5850	7605	9886.5	-
FCFE	960	1248	1622.5	2109.12	11995.62
PV @ 15%	834.78	943.67	1066.82	1205.90	-

Total = 4051.17

#### Stage 2

$$VF_4 = \frac{FCFF (PAT)}{K_e} = \frac{11995.62}{0.15} = 79,970.8$$

$$VF_0 = \frac{79970.8}{(1.15)^4} = 45,723.56$$

$$\text{Total IV} = 4,051.17 + 45,723.56 = 49,774.73$$

3. Value of Strategy = 49,774.73 – 28,000  
= 21,774.74

Note: Since the value of strategy is positive we should implement the strategy.

### Question 90

May 2019 (New) – RTP

Seawell Corporation, a manufacturer of do-it-yourself hardware and housewares, reported earnings per share of € 2.10 in 2013, on which it paid dividends per share of €0.69. Earnings are expected to grow 15% a year from 2004 to 2008, during this period the dividend payout ratio is expected to remain unchanged. After 2008, the earnings growth rate is expected to drop to a stable rate of 6%, and the payout ratio is expected to increase to 65% of earnings. The firm has a beta of 1.40 currently,

and is expected to have a beta of 1.10 after 2018. The market risk premium is 5.5%. The Treasury bond rate is 6.25%.

- What is the expected price of the stock at the end of 2018?
- What is the value of the stock, using the two-stage dividend discount model?

**Solution :**

- 1) Stage 1

$$\begin{aligned} R_e &= R_f + \beta(R_m - R_f) \\ &= 6.25 + 1.14(5.5) = 13.95\% \end{aligned}$$

- Stage 2

$$= 6.25 + 1.1(5.5) = 12.3$$

- 2) Stage 1

Year	EPS	DPS @32.857%	PV @13.95%
14	2.415	0.7935	0.696
15	2.777	0.9125	0.703
16	3.194	1.049	0.709
17	3.673	1.207	0.716
18	4.224	1.388	0.722
			3.546

- 3) Stage 2

$$V_{f18} = \frac{4.224 \times 1.06 \times 0.65}{0.123 - 0.06} = 49.196$$

$$V_{f13} = \frac{46.196}{(1.1395)^5} = 24.045$$

- 4) Total IV = 24.045 + 3.546  
= 27.59

**Question 91**

May 2019 (New) – RTP

The valuation of Hansel Limited has been done by an investment analyst. Based on an expected free cash flow of Rs.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 Rs.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 ninth of its book value. What is the correct value of Hansel Ltd?

**Solution :**

$$1) \quad V_f = \frac{FCFF_1}{K_c - g}$$

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

$$\therefore K_c = 12\%$$

2) Let the wt for debt be x

$$\therefore \text{Equity} = 1 - x$$

$$10x + 20(1 - x) = 12$$

$$10x + 20 - 20x = 12$$

$$\therefore x = 0.8$$

$$1 - x = 0.2$$

3) The above were book value with the market value wts shall be

$$\text{Debt} \quad 0.8 \times 0.9 = 0.72$$

$$\text{Equity} \quad \frac{0.2 \times 3}{1} = \underline{0.6} \\ \quad \quad \quad \quad \quad \quad 1.32$$

4)  $K_c$  based on market value wts

$$= 20 \times \frac{0.6}{1.32} + 10 \times \frac{0.72}{1.32} = 14.545\%$$

$$5) V_f = \frac{FCFF_1}{K_c - g} = \frac{54}{0.14545 - 0.09} = \text{Rs.}973.85$$

### Question 92

May 2019 (Old) – RTP

X Ltd. is a Shoes manufacturing company. It is all equity financed and has a paid-up Capital of Rs.10,00,000 (Rs.10 per share).

X Ltd. has hired Swastika consultants to analyse the future earnings. The report of Swastika consultants states as follows:

- (i) The earnings and dividend will grow at 25% for the next two years.
- (ii) Earnings are likely to grow at the rate of 10% from 3rd year and onwards.
- (iii) Further, if there is reduction in earnings growth, dividend payout ratio will increase to 50%.

The other data related to the company are as follows:

Year	EPS (Rs.)	Net Dividend per share (Rs.)	Share Price (Rs.)
2010	6.30	2.52	63.00
2011	7.00	2.80	46.00
2012	7.70	3.08	63.75
2013	8.40	3.36	68.75
2014	9.60	3.84	93.00

You may assume that the tax rate is 30% (not expected to change in future) and post tax cost of capital is 15%.

By using the Dividend Valuation Model, calculate

- (i) Expected Market Price per share
- (ii) P/E Ratio.

### Solution :

1) Stage 1

Year	EPS	DPS	PV @15%
1	12	4.8	4.174
2	15	6	4.537
			8.711

2) Stage 2

$$IV_3 = \frac{15 \times 1.1 \times 0.5}{0.15 - 0.1} = 165$$

$$IV_0 = \frac{165}{(1.15)^2} = 124.764$$

3) Total IV = 8.711 + 124.764 = 133.475

4) PE Rate =  $\frac{MPS}{EPS} = \frac{133.475}{9.6} = 13.9$  times**Question 93**

May 2019 (New) – Paper

Compute Economic Value Added (EVA) of Goodluck Ltd. From the following information :

**Profit & Loss Statement**

	Particulars	Rs. In Lakhs
(a)	Income -	
	Revenue from Operations	2,000
(b)	Expenses -	
	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	Rs. In Lakhs
	<b>Equity and Liabilities :</b>	
(a)	Shareholders' Fund -	
	Equity Share Capital	1,000
	Reserves & Surplus	600
(b)	Non - Current Liabilities -	
	Long Term Borrowings	200
(c)	Current Liabilities	800
	<b>Total</b>	<b>2,600</b>
	<b>Assets :</b>	



(a)	Non - Current Assets	2,000
(b)	Current Assets	600
	<b>Total</b>	<b>2,600</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 Rs.40 lakhs is included in indirect expenses and Rs.40 lakhs reduced from receivables in current assets.

**Solution :**

$$EVA = NOPAT - Kc$$

<b>1) NOPAT</b> EBIT                                800 + RDD                                40 Adjusted EBIT                    840 – Tax (30%)                        — NOPAT                                588	<b>2) Kc (%)</b> Ke        = 12% Kd        = 15% Kc        = $w + Ke + w + Kd$ = $\frac{1640}{1840} \times 12 + \frac{200}{1840} \times 15$ = 12.33%
<b>3) Kc(Amt)</b> = $1840 \times 12.33\% = 226.87$ $\therefore EVA = 588 - 226.87 = 361.128$	

**Question 94**

May 2019 (New) – Paper

The shares of G Ltd. Are currently being traded at Rs.46. The company published its results for the year ended 31<sup>st</sup> March 2019 and declared a dividend of Rs.5. The company made a return of 15% on its capital and expects that to be the norm in which it operates. G Ltd. Also expects the dividends to grow at 10% for the first three years and thereafter at 5%.

You are required to advise whether the share of the company is being traded at premium or discount. PVIF @ 15% for the next 3 years is 0.870, 0.756 and 0.658 respectively.

**Solution :**

1) Stage 1

Year	Div	PV @15%
1	5.5	4.78
2	6.05	4.57
3	6.655	4.38
		13.73

2) Stage 2

$$IV_3 = \frac{D_4}{Re - g} = \frac{6.655(1.05)}{0.15 - 0.05} = 69.8775$$

$$IV_0 = \frac{69.8775}{(1.15)^3} = 45.95$$

$$\text{Total IV} = 45.95 + 13.73 = 59.68$$

Advise : Since MP = 46, the stock is under priced and investor should go lay.

**Question 95**

May 2019 (New) – Paper

Following financial informations are available of XP Ltd. For the year 2018 :

Equity Share Capital (Rs.10 each)	Rs.200 Lakh
Reserves and Surplus	Rs.600 Lakh
10% Debentures (Rs.100 each)	Rs.350 Lakh
Total Assets	Rs.1200 Lakh
Assets Turnover Ratio	2 times
Tax Rate	30%
Operating Margin	10%
Dividend Payout Ratio	20%
Current Market Price per Equity Share	Rs.28
Required Rate of Return of Investors	18%

You are required to :

- Prepare Income Statement for the year 2018.
- Determine its Sustainable Growth Rate.
- Determine the fair price of the company's share using Dividend Discount Model.
- Give your opinion on investment in the company's share at current price.

**Solution :**

1) Income statements

Sales (1200 × 2)	2400
– Operating cost	2160
Operating margin (10%)	240
– Interest	35
EBT	205
– Tax (30%)	61.5
EAT	143.5
– Dividend (143.5 × 20%)	28.7
Retained earnings	114.8

- 2) G = br  
 b = Retention Ratio = 100 – Payout = 80%  
 $r = \text{roe} = \frac{\text{PAT}}{\text{Equation}} = \frac{143.5}{800} = 17.9375$   
 $\therefore G = 80 \times 17.9375\% = 14.35\%$

$$3) \quad IV = \frac{D_1}{Re - g} \quad D_1 = \frac{28.7}{20} \times 1.1435 = 1.6409$$

$$IV = \frac{1.6409}{0.18 - 0.1435} = \text{Rs.}44.96/\text{sh.}$$

4) Opinion = MP = 28, the stock is underpriced the investor should go long.

**Question 96****May 2019 (Old) – Paper**

Equity of KGF Ltd. (KGFL) is Rs.410 Crores, its debt is worth Rs.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?

**Solution :**

$$A) \quad \beta_A = \beta_L$$

$$\beta_A = 1.45 \times 74\% + 1.2 \times 26\% = 1.385$$

$$\beta_L = 1.385$$

$$\beta_L = w + \beta_E + w + \beta_D$$

$$1.385 = \frac{170}{580} \times 0.24 + \frac{410}{580} \beta_E$$

$$1.314655 = 0.70689655 \beta_E$$

$$\therefore \beta_E = 1.860$$

$$B) \quad \beta_E = ? \text{ New Debt : Equity} = 1.90, \beta_D = 0.35 \text{ New } \beta_D = 0.40$$

Existing capital = 580

Existing Debt = 170

New Debt Equity = 1.9 : 1

$$\text{New Debt} = 580 \times \frac{1.9}{2.9} = 380$$

New funds revised by debt = 380 – 170 = 210.

$$\beta_D = \frac{170}{380} \times 0.35 + \frac{210}{380} \times 0.4 = 0.38$$

Total Capital Remains at 580

$$\beta_L = 1.385$$

$$\beta_L = w\beta_E + w\beta_D$$

$$1.385 = \frac{200}{580} \times \beta_E + \frac{380}{580} \times 0.38$$

$$\beta_E = 3.29$$

- C) Since  $\beta_E$  will increase cost of equity i.e.  $R_e$  will also increase, it will decrease the value of equity.

**Question 97**

May 2019 (Old) – Paper

The closing price of LX Ltd. is Rs.24 per share as on 31st March, 2019 on NSE Ltd. The Price Earnings Ratio was 6. It was found that an amount of Rs.24 Lakhs as income and an extra ordinary loss of Rs.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 :

	(Rs. In Lakhs)
Sales	150
Material Cost	40
Labour cost	34
Fixed Cost	24

The company has 500,000 equity shares of Rs.10 each and 100,000 9% Preference Shares of Rs.100 each. The price Earnings Ratio is 6 times. Post tax cost of capital is 10 per cent per annum. Tax rate is 34 per cent.

You are required to determine :

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

**Solution :**

A) Existing profits for equity	$= \frac{24}{6} = 4 \times 500000$	
	<u>20,00,000</u>	
+ Preference div.	<u>9,00,000</u>	
PAT	29,00,000	66%
+ Tax	<u>                    </u>	34%
PBT	43,93,939	
–Ext. Income	24,00,000	
+ Ext. Loss	<u>9,00,000</u>	
	<u>28,93,939</u>	

B) New Business	
Sales	150
– MC	40
– LC	34
–	<u>24</u>
	52

- C) Total = 30,93,939  
 – Tax \_\_\_\_\_ 34%  
           53,42,000
- D) Value of Business =  $\frac{5342000}{0.1} = 5,34,20,000$

**Question 98****May 2019 (Old) – Paper**

An investor is considering purchasing the equity shares of Lx Ltd., whose current market price (CMP) is 150. The company is proposing a dividend of Rs.6 for the next year. LX is expected to grow @ 18 per cent per annum for the next four years. The growth will decline linearly to 14 per cent per annum after first four years. Thereafter, it will stabilize at 14 per cent per annum infinitely. The required rate of return is 18 per cent per annum.

You are required to determine :

- (i) The intrinsic value of one share  
 (ii) Whether it is worth to purchase the share at this price

t	1	2	3	4	4	5	6	7
PVIF (18, t)	0.847	0.718	0.609	0.516	0.437	0.370	0.314	0.266

**Solution :**

- 1) Stage 1

Year	Div.	PV @18%
1	6	5.085
2	7.08	5.085
3	8.3544	5.085
4	9.858	5.085
		20.34

- Stage 2

$$IV_4 = \frac{D_5}{Re - g} = \frac{9.858(1.14)}{0.18 - 0.14} = 280.953$$

$$IV_0 = \frac{280.953}{(1.18)^4} = 144.91$$

$$\text{Total IV} = 144.91 + 20.34 = 165.25$$

- 2) The CMP = 150, share is underpriced in market and therefore we should Buy.

