EQUITY VALUATION

IMPORTANT QUESTIONS

CLASS WORK QUESTIONS

Question 3:

i. Estimation of P/E Ratio using Gordon Growth Model

$$k_e = \frac{D_1}{P} + g$$

$$0.14 = \frac{1(1.02)}{P} + 0.02$$

$$P = Rs.\ 8.50$$

$$PE\ Ratio = \frac{Rs.\ 8.50}{Rs.\ 2.50} = 3.40$$

ii. Long Term Growth Rate implied

Based on Current PE Ratio, the price per share = Rs. 2.50 x 7 Times = Rs. 17.50

We know that

$P = D_0(1+g)/ (k_e – g)$

Rs. 17.50 = Rs. 1(1+g)/ (0.14 – g)

17.50 x 0.14 – 17.50g = 1 + g

g = 0.0784 i.e. 7.84%

Question 21:

E_1 = ROE × BVPS
= 80 × 17%
= 13.6

g = b × r
= 0.2 × 0.17
= 3.7%

D_1 = 10.88 (13.6 × 80%)

$$\therefore\ PV_0 = \frac{10.88}{11.6\%} = 93.79$$

Question 26:

i. Expected EPS for next years

EPS 1	= €10 (1 + 0.20)	= € 12
EPS 2	= € 12 (1 + 0.20)	= €14.40
EPS 3	= € 14.40 (1 + 0.20)	= € 17.28
EPS 4	= € 17.28 + (1 + 0.20)	= €20.736
EPS 5	= € 20,736 (1 + 0.20)	= € 24.88
EPS 6	= €24.88(1 + 0.15)	= € 28.61

Thus D 6 = 0.40(€ 28.61) = € 11.44

Hence, value of DESC's share 5 years from now =

$$P5 = \frac{D_6}{Ke - g} = \frac{11.44}{15\% - 9\%} = € 191$$ [Note: g = 0.60 × 0.15 = 9%]

So the value of DESC's share today is $\frac{191}{(1+0.15)^5} = € 94.96$

Note : There is no dividend payment from year 1 to year 5 as given in question

Note : Growth rate from year 1 to year 5 : g = b × r = 100% ×0.20= 20%

ii. The price should rise by 15% per year until year 6.

iii. The value of DESC's shares 5 years from now.

D_6 = 20% of E_6
=20% of 28.61
= 5.724

$P_5 = \frac{D_6}{R_e - g} = \frac{5.724}{0.15 - 0.12} = 190.8$

[**Note :** g = 0.80 × 0.15 = 12%]

Note : g = b ×r = 0.80× 0.15= 0.12and D6 = 28.61×20% = 5.722

Question 29:

Working Notes:

a. Determination of Weighted Average Cost of Capital

Sources of funds	Cost (%)	Proportions	Weights	Weighted Cost
Equity Stock	16	12/20	0.60	9.60
12% Bonds	12%(1-0.30) = 8.40	8/20	0.40	3.36
				12.96 say 13

b. Schedule of Depreciation

Year	Opening Balance of Fixed Assets	Addition during the year	Total	Depreciation @ 15%
1	17.00	0.50	17.50	2.63
2	14.87	0.80	15.67	2.35
3	13.32	2.00	15.32	2.30
4	13.02	2.50	15.52	2.33
5	13.19	3.50	16.69	2.50
6	14.19	2.50	16.69	2.50
7	14.19	1.50	15.69	2.35
8	13.34	1.00	14.34	2.15

c. Determination of Investment

$ Million

Year	Investment Required		Total	Existing Investment in CA	Additional Investment required
	For Capital Expenditure	CA (20% of Revenue)			
1	0.50	1.60	2.10	3.00	0.00
2	0.80	2.00	2.80	2.50*	0.30
3	2.00	3.00	5.00	2.00**	3.00
4	2.50	4.40	6.90	3.00	3.90
5	3.50	6.00	9.50	4.40	5.10
6	2.50	5.20	7.70	6.00	1.70
7	1.50	4.60	6.10	5.20	0.90
8	1.00	4.00	5.00	4.60	0.40

* Balance of CA in Year 1 ($3 Million) – Capital Expenditure in Year 1($ 0.50 Million)

** Similarly balance of CA in Year 2 ($2.80) – Capital Expenditure in Year 2($ 0.80 Million)

d. Determination of Present Value of Cash Inflows

$ Million

Particulars	Years							
	1	2	3	4	5	6	7	8
Revenue (A)	8.00	10.00	15.00	22.00	30.00	26.00	23.00	20.00
Less: Expenses								
Variable Costs	3.20	4.00	6.00	8.80	12.00	10.40	9.20	8.00
Fixed cash operating cost	1.60	1.60	1.60	1.60	2.00	2.00	2.00	2.00
Advertisement Cost	0.50	1.50	1.50	3.00	3.00	3.00	1.00	1.00
Depreciation	2.63	2.35	2.30	2.33	2.50	2.50	2.35	2.15
Total Expenses (B)	7.93	9.45	11.40	15.73	19.50	17.90	14.55	13.15
EBIT (C) = (A) - (B)	0.07	0.55	3.60	6.27	10.50	8.10	8.45	6.85
Less: Taxes@30% (D)	0.02	0.16	1.08	1.88	3.15	2.43	2.53	2.06
NOPAT (E) = (C) - (D)	0.05	0.39	2.52	4.39	7.35	5.67	5.92	4.79
Gross Cash Flow (F) = (E) + Dep	2.68	2.74	4.82	6.72	9.85	8.17	8.27	6.94
Less: Investment in Capital Assets plus Current Assets (G)	0	0.30	3.00	3.90	5.10	1.70	0.90	0.40
Free Cash Flow (H) = (F) - (G)	2.68	2.44	1.82	2.82	4.75	6.47	7.37	6.54
PVF@13% (I)	0.885	0.783	0.693	0.613	0.543	0.480	0.425	0.376
PV (H)(I)	2.371	1.911	1.261	1.729	2.579	3.106	3.132	2.46

Total present value = $ 18.549 million

e. Determination of Present Value of Continuing Value (CV)

$$CV = \frac{FCF_9}{k-g} = \frac{\$6.54\,million\,(1.05)}{0.13-0.05} = \frac{\$6.867\,million}{0.08} = \$85.8375\ million$$

Present Value of Continuing Value (CV) = \$85.8376 million X $PVF_{13\%,8}$ = \$85.96875 million X 0.376 = \$32.2749 million

(i) Value of Firm

	$ Million
Present Value of cash flow during explicit period	18.5490
Present Value of Continuing Value	32.2749
Total Value	50.8239

(ii) Value of Equity

	$ Million
Total Value of Firm	50.8239
Less: Value of Debt	8.0000
Value of Equity	42.8239

Question 31:

$$\text{No. of Shares} = \frac{₹\ 1,900\,crores}{₹\ 50} = 38\ crores$$

$$EPS = \frac{PAT}{No.of\ shares}$$

$$EPS = \frac{₹\ 560\,crores}{38\,crores} = ₹\ 14.737$$

$$\text{Cost of Equity} = R_f + ß\,(R_m - R_f)$$

$$= 9.5 + 0.1\,(12.6 - 9.5) = 9.81\%$$

$$FCFE = \text{Net income} - [(1-b)\,(capex - dep) + (1-b)\,(\Delta WC)]$$

$$FCFE = 14.737 - [(1-0.43)\,(53-45) + (1-0.43)\,(4.62)]$$

$$= 14.737 - [4.56 + 2.6334] = 7.5436$$

$$P_o = \frac{FCFE(1+g)}{K_e - g} = \frac{7.5436(1.07)}{0.0981-0.07} = \frac{8.0716}{0.0281} = ₹\ 287.25$$

Question 35:

As per Firm Cash Flow Approach

i. Computation of tax rate

EBIT	=	₹ 245 lakh
Interest	=	₹ 218.125 lakh
PBT	=	₹ 26.875 lakh
PAT	=	₹ 17.2 lakh
Tax paid	=	₹ 9.675 lakh
Tax rate	=	₹ 9.675 /26.875 = 0.36 =36%

ii. Computation for increase in working capital

Working capital (2009) = ₹ 44 lakh

Increase in 2010 = ₹ 44 X 0.08 = ₹ 3.52 lakh

It will continue to increase @ 8% per annum.

iii. Weighted average cost of capital

Present debt = ₹ 1934 lakh

Interest cost = ₹ 218.125 lakh / ₹ 1934 = 11.28 %

Equity capital = 75 lakh X₹ 66 = ₹ 4950 lakh

$$Kc = \frac{4950}{1934 + 4950} \times 16\% + \frac{1934}{1934 + 4950} \times 11.28(1 - 0.36) = 11.51 + 2.028 = 13.54$$

iv. As capital expenditure and depreciation are equal, they will not influence the free cash flows of the company.

v. Computation of free cash flows upto 2012

Year	2010	2011	2012	2013	2014
	₹	₹	₹	₹	₹
EBIT (1-t)	169.344 lakh	182.89 lakh	197.52 lakh	213.32 lakh	230.39 lakh
Increase in working capital	3.52 lakh	3.80 lakh	4.10 lakh	4.43 lakh	4.78 lakh
Debt repayment	-	-	-	-	1934 × 0.30 = 580.2 lakh
Free cash flows	165.824 lakh	179.09 lakh	193.41 lakh	208.89 lakh	-354.59 lakh
PVF @ 13.54%	0.8807	0.7757	0.6832	0.6017	0.53
PV of free cash flow @ 13.54%	146.04 lakh	138.92 lakh	132.14 lakh	125.69 lakh	-187.93 lakh

Present value of free cash flows upto 2014 = ₹ 354.86 lakh

vi. Cost of capital (2014 Onwards)

Debt = 0.7 X ₹ 1934 = ₹ 1353.80 lakh

Equity = ₹ 4950 lakh

$$Kc = \frac{4950}{4950 + 1353.80} \times 16\% + \frac{1353.80}{4950 + 1353.80} \times 11.28(1 - 0.36)$$

$= 12.56 + 1.55\% = 14.11\%$

vii. Continuing value

$$\frac{240.336}{0.1411 - 0.06} \times (1/1.1354)^5 = ₹\ 1{,}570.556 \text{ lakh}$$

a. Value of the firm = PV of free cash flows upto 2014 + continuing value

= ₹ 354.86 lakh + ₹ 1,570.556 lakh

= ₹ 1925.416 lakh

b. Value per share **= (Value of Firm – Value of Debt)/ Number of Shares**

= (₹ 1925.416 lakh – ₹ 1353.80 lakh) / 75 lakh

= ₹ 7.622<₹ 66 (present market price)

Alternatively, following value can also be considered

= (Value of Firm – Value of Debt)/No. of Shares

= (₹ 1925.416 lakh - ₹ 1934)/75 lakh

= - ₹ 0.1145 or ₹ 0

Thus, share has zero value, and hence overvalued.

Answer as per Equity Cash Approach

i. Computation of tax rate

EBIT = ₹ 245 lakh

Interest = ₹ 218.125

PBT = ₹ 26.875 lakh

PAT = ₹ 17.2 lakh

Tax Paid = ₹ 9.675 lakh

Tax rate = ₹ 9.675/26.875 = 0.36 = 36%

ii. Computation for increase in working capital

Working capital (2009) = ₹ 44 lakh

Increase in 2010 = ₹l44 lakh x 0.08 = ₹ 3.52 lakh

iii. As capital expenditure and depreciation are equal, they will not influence the free cash flows of the company.

iv. Computation of free cash flows upto 2014

Year	2010	2011	2012	2013	2014
	₹ lakh	₹ lakh	₹ lakh	₹ lakh	₹ lakh
EBIT	245.000	264.600	285.768	308.629	333.319
Less Interest	218.125	218.125	218.125	218.125	152.688
EBT	26.875	46.475	67.643	90.504	180.631
Tax	9.675	16.266	24.351	32.581	65.027

EAT	17.200	30.209	43.292	57.923	115.604
Increase in working capital	3.52	3.80	4.10	4.43	4.78
Debt repayment	-	-	-	-	1934 × 0.30 = 580.20
Free cash flows	13.68	26.409	39.192	53.493	-469.376
PVF @ 16%	0.8621	0.7432	0.6407	0.5523	0.4761
PV of free cash flow	11.794	19.627	25.110	29.544	-223.470

Present value of free cash flows upto 2014 = - ₹ 137.395 lakh

v. Continuing value

$$\frac{117.473^*}{0.16 - 0.06} \times (1/1.16)^5 = ₹\ 559.304 \text{ lakh}$$

* (115.604 – 4.78) (1.06)

a. Value of the Equity = PV of free cash flows upto 2014 + continuing value
= - ₹137.395 lakh + ₹559.304 lakh
= ₹421.909 lakh

b. Value per share = Value of Equity/Number of Shares
= ₹421.909 lakh/75 lakh
= 5.62< ₹66 (present market value)

Question 36:

a. Projected Balance Sheet

	Year 1	Year 2	Year 3	Year 4
Fixed Assets (40% of Sales)	19,200	23,040	27,648	27,648
Current Assets (20% of Sales)	9,600	11,520	13,824	13,824
Total Assets	28,800	34,560	41,472	41,472
Equity	14,400	17,280	20,736	41,472

b. Projected Cash Flows:-

	Year 1	Year 2	Year 3	Year 4
Sales	48,000.00	57,600.00	69,120.00	69,120
PBT (10% of sale)	4800.00	5760.00	6,912.00	6,912
PAT (70%)	3360.00	4032.00	4,838.40	4,838.40
Depreciation	1600.00	1920.00	2304.00	2,764.00
Addition to Fixed Assets	4800.00	5760.00	6912.00	2,764.00
Increase in Current Assets	1600.00	1920.00	2304.00	--
Operating cash flow (FCFF)	-1440.00	-1728.00	-2073.60	4,838.40

Projected Cash Flows:-

Present value of Projected Cash Flows:-

Cash Flows	*PVF at 15%*	*PV*
-1440.00	0.870	- 1,252.80
-1728.00	0.756	- 1,306.37
-2073.60	0.658	- 1,364.43
		- 3,923.60

Residual Value = 4,838.40/0.15 = 32,256
Present value of Residual value = $32,256/(1.15)^3$ = 32,256/1.521
= 21,207.10
Total shareholders' value = 21,207.10 – 3,923.60
= 17,283.50
Pre strategy value = 2,800 / 0.15
= 18,666.67
∴ Value of strategy = 17,283.50 – 18,666.67
= – 1,383.17

Evaluation: The strategy is not financially viable. However, it may be viable considering other non-financial factors.

Question 39:

Estimation of Ratios

Sl. No.	Particulars	SK Ltd.	AS Ltd.	Average
(i)	Market to Book Value	$\left(\frac{450}{400}\right)$ = 1.125	$\left(\frac{400}{300}\right)$ = 1.333	1.2290
(ii)	Market to Replacement Cost	$\left(\frac{450}{600}\right)$ = 0.750	$\left(\frac{400}{550}\right)$ = 0.727	0.7385
(iii)	Market to Sales	$\left(\frac{450}{550}\right)$ = 0.818	$\left(\frac{400}{450}\right)$ = 0.889	0.8535
(iv)	Market to Net Income	$\left(\frac{450}{18}\right)$ = 25	$\left(\frac{400}{16}\right)$ = 25	25

Application of Ratios to XY Ltd.

Sl. No.	Particulars	XY Ltd. (₹)	Average	Indicative Value of XY Ltd. (₹)
(i)	Book Value	250	1.2290	250 x 1.2290 = 307.25
(ii)	Replacement Cost	500	0.7385	500 x 0.7385 = 369.25
(iii)	Sales	500	0.8535	500 x 0.8535 = 426.75
(iv)	Net Income	14	25	14 x 25 = 350.00
Average				₹ 363.31

Value of XY Ltd. according to the comparable method is ₹ 363.31.

Question 47:

i. $WACC_P$ = [14.0%(1 - 0.35)](0.80) + 26.0%(0.20) = 12.48%
$WACC_Q$ = [12.0%(1 - 0.35)](0.50) + 22.0%(0.50) = 14.90%
$WACC_R$ = [10.0%(1 - 0.35)](0.20) + 20.0%(0.80) = 17.30%

ii. EVA = EBIT(1 - T) - (WACC x Invested capital)
EVA_P = €25,000(1 - 0.35) - (0.1248 x €100,000)
= €16,250 - €12,480
= €3,770
EVA_Q = €25,000(1 - 0.35) - (0.1490 x €100,000)
= €16,250 - €14,900
= €1,350
EVA_R = €25,000(1 - 0.35) - (0.1730 x €100,000)
= €16,250 - €17,300
= -€1,050

iii. $EVA_P > EVA_Q > EVA_R$; Thus, P Ltd. would be considered the best investment. The result should have been obvious, given that the firms have the same EBIT, but $WACC_P < WACC_Q < WACC_R$.

iv.

	P Ltd.	**Q Ltd.**	**R Ltd.**
EBIT	€25,000	€25,000	€25,000
Interest[a]	(11,200)	(6,000)	(2,000)
Taxable income	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	€22.43

$Interest_P$ = €100,000(0.80) x 0.14 = €11,200
$Interest_Q$ = €100,000(0.50) x 0.12 = € 6,000
$Interest_R$ = €100,000(0.20) x 0.10 = € 2,000

v. 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 48:

Stage 1 Explicit forecast period (1st 2 yrs)

Particulars	**Yr 1**	**Yr.2**
a) Adjusted NOPAT	14,00,000	16,00,000
b) Capital employees	90,00,000	1,00,00,000

c) Capital charge = .42% of 6	7,57,800	8,42,000
d) EVA (a - c)	6,42,200	7,58,000
e) PV @ 8.42%	59,2326	64,4838

$\therefore$ PV of EVA for the 1st 2 yrs $\rightarrow$ 1237164

Stage 2 : Horizon period (beyond 2 yrs)

EVA_3 = 758000 × 1.065

= 807270

$$\therefore MVA_2 = \frac{807270}{0.0842 - 0.065} = 42045313$$

$$\text{PV of } MVA_2 = \frac{42045.313}{(1.0842)^2} = 35768340$$

$\therefore$ MVA today = Stage 1 + Stage 2

= 37005504

Hence EV today = Capital Employed + MVA

= 9000000 + 37005504

= 46005504

Question 52:

a. Calculation of Profit after tax (PAT)

		₹
Profit before interest and tax (PBIT)		32,00,000
Less: Debenture interest (₹ 64,00,000 × 12/100)		7,68,000
Profit before tax (PBT)		24,32,000
Less: Tax @ 35%		8,51,200
Profit after tax (PAT)		15,80,800
Less: Preference Dividend (₹ 40,00,000 × 8/100)	3,20,000	
Equity Dividend (₹ 80,00,000 × 8/100) 6,40,000		9,60,000
Retained earnings (Undistributed profit)		6,20,800

Calculation of Interest and Fixed Dividend Coverage

$$= \frac{\text{PAT + Debenture interest}}{\text{Debenture interest + Preference dividend}} \text{ or } \frac{\text{PAT + Debenture Interest Net of Tax}}{\text{Debenture interest + Preference dividend}}$$

$$= \frac{15,80,800 + 7,68,000}{7,68,000 + 3,20,000} \text{ or } \frac{15,80,800 + 4,99,200}{7,68,000 + 3,20,000}$$

$$= \frac{23,48,800}{10,88,000} \text{ or } \frac{20,80,000}{10,88,000} = 2.16 \text{ times or } 1.91 \text{ times}$$

b. Calculation of Capital Gearing Ratio

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

$$= \frac{\text{Preference Share Capital + Debentures}}{\text{Equity Share Capital + Reserves}} = \frac{40,00,000 + 64,00,000}{80,00,000 + 32,00,000} = \frac{1,04,00,000}{1,12,00,000} = 0.93$$

c. Calculation of Yield on Equity Shares:

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

	(₹)
50% on distributed profits (₹ 6,40,000 × 50/100)	3,20,000
5% on undistributed profits (₹ 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

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.

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.

Risk Premium = (0.75 – 0.93) (2%) = 0.18 (2%) = 0.36%

	(%)
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

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

Question 53:

	₹ lakhs
Net Assets Method	
Assets: Land & Buildings	96
Plant & Machinery	100
Investments	10
Stocks	20
Debtors	15
Cash & Bank	5
Total Assets	**246**
Less: Long Term Debts	30
Net Assets	**216**

Value per share

i. Number of shares = $\frac{1,00,00,000}{10} = 10,00,000$

ii. Net Assets ₹ 2,16,00,000

$\frac{₹\ 2,16,00,000}{10,00,000} = ₹\ 21.6$

Profit-earning Capacity Method		₹ lakhs
Profit before tax		64.00
Less: Extraordinary income	4.00	
Investment income (not likely to recur)	1.00	5.00
		59.00
Less: Additional expenses in forthcoming years		
Advertisement	5.00	
Depreciation	6.00	11.00
Expected earnings before taxes		**48.00**
Less: Income-tax @ 30%		14.40
Future maintainable profits (after taxes)		**33.60**

Value of business

Capitalisation factor	$\frac{33.60}{0.15}$	224
Less: Long term Debts		30
		194

Value per share = $\frac{1,94,00,000}{10,00,000}$ = ₹ 19.40

Fair Price of share	₹
Value as per Net Assets Method	21.60
Value as per Profit earning capacity (Capitalisation) method	19.40

Fair Price= $\frac{21.60 + 19.40}{2} = \frac{41.00}{2}$	₹ 20.50

Question 54:

Workings:

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

i. Income statement

	(₹ Lakhs)
Sale	660
Operating Exp	594
EBIT	66
Interest	14
EBT	52
Tax @ 40%	20.80
EAT	31.20
Dividend @ 16.67%	5.20
Retained Earnings	26.00

ii. SGR = ROE (1-b)

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

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

SGR = 0.078(1 - 0.1667) = 6.5%

$$\text{or, } \frac{0.078 \times 0.8333}{1 - 0.078 \times 0.8333} = 6.95\%$$

iii. Calculation of fair price of share using dividend discount model

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

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

Growth Rate = 6.5% or 6.95%

$$\text{Hence } P_o = \frac{₹\ 0.52(1 + 0.065)}{0.15 - 0.065} = \frac{₹\ 0.5538}{0.085} = ₹\ 6.51$$

$$\text{or, } \frac{0.52(1 + 0.0695)}{0.15 - 0.0695} = \frac{0.5561}{0.0805} = ₹\ 6.91$$

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

Question 56:

a.

i. **Current market price of shares already in issue:**

$$\text{Earnings per share} = \frac{\text{Rs. } 75,00,000}{4,00,000}$$

$$= \text{Rs. } 18.75$$

$$\text{P/E ratio} = \frac{\text{Market price per share}}{\text{Earnings per share}}$$

$$= 8$$

$$\text{Market price per share} = 8 \text{ X Rs. } 18.75$$

$$= \text{Rs. } 150$$

ii. **Price at which rights issue will be made:**

Rs. 150 X 75% = Rs. 112.50

iii. **Number of new shares that will be issued:**

Rs.2,02,50,000/ Rs.112.50 = 180000 shares

iv. **Ex-rights price is**

$$\text{Rs.}150 \times \frac{4,00,000}{5,80,000} + \text{Rs.}112.50 \times \frac{1,80,000}{5,80,000} \times \frac{15\%}{12.5\%^*}$$

= Rs. 103.44 +Rs. 41.90 = Rs. 145.34

* The price/earnings ratio is given as 8. This would imply an earnings yield of (1÷8) = 12.5%. This is assumed to be the yield or rate of return on existing funds.

b. Assume that a shareholder holds 20 shares, the rights issue means addition of another 9 shares. Theoretical, the selling price of the right to purchase one share will be (Rs. 145.34 – Rs. 112.50), that is Rs. 32.84. Let us discuss the two cases first if he opt for taking the right and second if he does not taking the right but selling it.

(i) Taking up the rights:

	Rs.
Market value of 29 shares at £145.34 each	4,214.86
Less: Cost of taking up rights of nine new shares at Rs. 112.50 each	1,012.50
	3,202.36

(ii) Selling the rights:

	Rs.
Market value of 20 shares at £145.34 each	2,906.80
Add: Sale of 9 rights at Rs. 32.84 each	295.56
	3,202.36

Question 59:

Working Notes:

Calculation of Cost of Capital

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

D_1 = ₹1.40

P_0 = ₹22.60 – ₹1.40 = ₹21.20

$$k_e = \frac{1.40(1+0.06)}{21.20} + 0.06 = 13\%$$

i. NPV of the Project

This k_e shall be used to value PV of income stream

$$V = \frac{₹\ 15.30 \text{ crore}}{k_e - g} = \frac{₹\ 15.30 \text{ crore}}{0.13 - 0.04} = ₹\ 170 \text{ crore}$$

PV of Cash Inflows from Expansion Project	₹ 170 crore
Less: PV of Initial Outlay	₹ 150 crore
NPV	₹ 20 crore

Since NPV is positive we should accept the project.

ii. By right issue new number of equity shares to be issued shall be:

50 crore (Existing) + 10 crore(Right Issue) = 60 crore

Market Value of Company = PV of existing earnings + PV of earnings from Expansion

$$= \frac{₹\ 1.40 \times 50 \text{ crore} \times (1 + 0.06)}{0.13 - 0.06} + ₹\ 170 \text{ crore}$$

= ₹ 1060 crore + ₹ 170 crore = ₹ 1230 crore

Price Per Share = ₹ 1230 crore / 60 crore = ₹ 20.50

iii. Let n be the number of new equity shares to be issued then such shares are to be issued at such price that new shareholders should not suffer any immediate loss after subscribing shares. Accordingly,

$$\frac{n}{50 \text{ crore} + n} \times ₹\ 1230 \text{ crore} = ₹\ 150 \text{ crore}$$

1230 n = 7500 + 150n

n = 7500/1080 = 6.9444 crore

$$\text{Issue Price Per Share} = \frac{₹\ 150 \text{ crore}}{6.9444 \text{ crore}} = ₹\ 21.60$$

or

$$\text{Ex - Dividend Price Per Share} = \frac{₹\ 1230 \text{ crore}}{56.9444 \text{ crore}} = ₹\ 21.60$$

iv. Benefit from expansion

a.	**Right Issue**		**₹ crore**
	Shareholder's Current Wealth (₹ 22.60 x 50 crore)		1130
	Less:	**₹ Crore**	
	Value of 60 crore shares @ ₹ 20.50	1230	
	Cash Dividend Received @ ₹ 1.40 per share on 50 crore shares	70	
	Cash paid to subscribe Right Shares (₹15 x 10 crore)	(150)	1150
	Net Gain		**20**
	or		
	Shareholder's Current Wealth (₹21.20 x 50 crore)		1060
	Less:	**₹ Crore**	
	Value of 60 crore shares @ ₹ 20.50	1230	
	Cash paid to subscribe Right Shares (₹ 15 x 10 crore)	(150)	1080
	Net Gain		**20**
b.	**Fresh Issue**		**₹ crore**
	Shareholder's Current Wealth (₹22.60 x 50 crore)		1130
	Less:	**₹ Crore**	
	Value of existing 50 crore shares @ ₹21.60	1080	
	Cash Dividend Received @ ₹1.40 per share on 50 crore shares	70	1150

	Net Gain		20
	or		
	Shareholder's Current Wealth (₹21.20 x 50 crore)		1060
	Value of existing 50 crore shares @ ₹21.60		1080
	Net Gain		**20**

Question 62:

Working Notes

1. **Calculation of Return on Capital Employed (ROCE)**

	(₹ in crores)
Capital Employed:	
Share Capital (₹ 10 x 40 lakhs)	4
Reserves	8
Debt (₹ 1 cr. x 100/10)	10
	22
PBIT	5
ROCE	22.73%

2. **Revised PBIT**

Existing Capital Employed	22
Additional	3
ROI	22.73%
Revised PBIT	5.6825

3. **New Debt/Equity**

Existing Debt	10
Additional Under Option (i)	3
Total Debt	13
Total Equity	12

New Debt to Capital Employed Ratio = 13/25=0.52

So, P/E Ratio to be reduced to 8 times

4. **Debt to Capital Employed Ratio in Option (ii)**

=10/25=0.40

So, P/E Ratio to be reduced to 8 times in this case also

5. **Number of additional shares to be issued in case of Option (ii)**

Funds to be raised ₹ 3 crore

Price per share ₹ 25

No. of additional shares to be issued ₹ 3 crore/ ₹ 25 = 12 lakhs

Particulars	Option (i)	Option (ii)
PBIT (Revised) (₹ Crore)	5.6825	5.6825
Less: Interest on Debt	1.42	1.00
PBT (₹ Crore)	4.2625	4.6825
Tax @ 25% (₹ Crore)	1.0656	1.1706
PAT (₹ Crore)	3.1969	3.5119
No. of shares outstanding	40 lakhs	52 lakhs
EPS	₹ 7.99	₹ 6.75
P/E Ratio	8	8
New Share Price	₹ 63.92	₹ 54.00

Decision:

Since the MPS is expected to be more in the case of additional financing done through debt (Option – I) Option – I is preferred.

Question 64:

First, we shall compute the Cost of Equity using CAPM as follows:

$k_e = R_f + \beta(R_m - R_f)$
= 5% + 2(7.50% - 5.00%) = 10%

P.V. of dividend stream and sales proceeds

Year	Divd. /Sale	PVF (10%)	PV (₹)
1	₹ 20/-	0.909	18.18
2	₹ 20/-	0.826	16.52
3	₹ 20/-	0.751	15.02
4	₹ 20/-	0.683	13.66
5	₹ 25/-	0.621	15.53
6	₹ 25/-	0.564	14.10
7	₹ 25/-	0.513	12.83
7	₹ 1250/- (₹ 1000 x 1.25)	0.513	641.25
			747.09
Less: Cost of Share (₹ 500 x 1.05)			₹ 525.00
Net gain			₹ 222.09

Since Mr. X is gaining ₹ 222.09 per share, he should buy the share.
Maximum price Mr. A should be ready to pay is ₹ 747.09.

Question 65:

i. Let P be the buyback price decided by Rohan Ltd.

Market Capitalisation after Buyback
1.15P (Original Shares – Shares Bought Back)

$= 1.15P\ [10\ \text{Lakhs} - \frac{(35\%\ \text{of}\ 150\ \text{lakhs})}{P}]$

= 1.15 lakhs × P – 52.5 lakhs × 1.15

= 11.50 lakhs P – 60.375 lakhs Again, 1.15 lakhs P – 60.375 lakhs or 11.50 lakhs P

= 320 lakhs + 60.375 lakhs

$\text{or } P = \frac{380.375}{11.50} = ₹\ 33.08\ \text{per share}$

ii. Number of Shares to be Bought Back:

$\frac{52.50\ \text{Lakhs}}{33.08} = 1.59\ \text{lakhs (Approx.) or } 158706\ \text{share}$

iii. New Equity Shares:

10 lakhs – 1.59 lakhs = 8.41 lakhs or 1000000 – 158706 = 841294 shares

$\therefore EPS = \frac{3 \times 10\ \text{lakhs})}{8.41} = ₹\ 3.57$

Thus, EPS of Rohan Ltd., increases to ₹ 3.57

Question 66:

$\text{Existing No. of Equity Shares} = \frac{₹1500\ \text{crore}}{₹\ 1,500} = 1\ \text{Crore}$

No. of shares to be bought back = 1 Crore x 0.20 = 20 Lakh

Price at which share to be bought back = ₹ 1,500 + 10% of ₹ 1,500 = ₹ 1,650

Amount required for Buyback of Shares = ₹ 1,650 x 20 Lakh = ₹ 330 Crore

Amount of Loan @ 16% = ₹ 330 Crore

Statement showing Post Buyback EPS

Profit before tax (₹ 200 crore/ 0.70)	₹ 285.7143 crore
Less: Interest on Loan (₹ 330 Crore x 16%)	₹ 52.8000 crore
Profit before Tax	₹ 232.9143 crore
Tax	₹ 69.8743 crore
Profit after Tax (PAT)	₹ 163.0400 crore
No. of Shares Post buyback	80 Lakh
EPS (Post Buyback) (₹ 163.0400 Crore/ 80.00 Lakh)	₹ 203.80

Question 69:

i. Number of shares to be issued : 5,00,000
Subscription price ₹ 20,00,000 / 5,00,000 = ₹ 4

$\text{Ex-right Price} = \frac{₹\ 1,30,00,000 + ₹\ 20,00,000}{15,00,000} = ₹\ 10$

Value of a Right = ₹ 10 – ₹ 4 = ₹ 6

$$\text{Value of a Right Per Share Basis} = \frac{₹10 - ₹4}{2} = ₹3$$

ii. Subscription price ₹ 20,00,000 / 2,50,000 = ₹ 8

$$\text{Ex-right Price} = \frac{₹\ 1,30,00,000 + ₹\ 20,00,000}{12,50,000} = ₹\ 12$$

Value of a Right = ₹ 12 – ₹ 8 = ₹ 4

$$\text{Value of a Right Per Share} = \frac{₹12 - ₹8}{4} = ₹1$$

iii. **Calculation of effect of right issue on wealth of Shareholder's wealth who is holding 100 shares.**

(a)	When firm offers one share for two shares held.	
	Value of Shares after right issue (150 X ₹ 10)	₹ 1,500
	Less: Amount paid to acquire right shares (50X₹4)	₹ 200
		₹ 1,300
(b)	When firm offers one share for every four shares held.	
	Value of Shares after right issue (125 X ₹ 12)	₹ 1,500
	Less: Amount paid to acquire right shares (25X₹8)	₹ 200
		₹ 1,300
(c)	Wealth of Shareholders before Right Issue	₹ 1,300

Thus, there will be no change in the wealth of shareholders from (i) and (ii).

Question 70:

Value of share at present

$$= \frac{D_1}{k_e - g}$$

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

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

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

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

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

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

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

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

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

Question 73:

Sustainable Growth Rate under Proposal 1

Sales (Given)		₹ 30 Lakhs
Total Assets	₹ 30 Lakhs x 0.65	₹ 19.50 Lakhs
Net Profit	₹ 30 Lakhs x 4%	₹ 1.20 Lakhs
Equity Multiplier	$\frac{\text{Equity}}{\text{Equity + Debt}} = \frac{\text{12 Lakhs}}{\text{12 Lakhs + 8 Lakhs}}$	0.6
ROE	$\frac{\text{1.20 Lakhs}}{\text{19.50 Lakhs}} \times 0.60 \times 100$	3.69%

Sustainable Growth Rate = ROE x Retention Ratio
= 3.69% x 0.75 = 2.77%

Sustainable Growth Rate under Proposal 2

New Equity = ₹ 12 Lakhs + ₹ 1 Lakh = ₹ 13 Lakhs

New Debt = ₹ 13 Lakhs x 4 = ₹ 52 Lakhs

Total Assets = ₹ 13 Lakhs + ₹ 52 Lakhs = ₹ 65 Lakhs

Sales	₹ 65 Lakhs / 0.62	₹ 104.84 Lakhs
Net Profit	₹ 104.84 Lakhs x 5%	₹ 5.242 Lakhs
Equity Multiplier	$\frac{\text{Equity}}{\text{Equity + Debt}} = \frac{\text{13 Lakhs}}{\text{13 Lakhs + 52 Lakhs}}$	0.2
ROE =	$\frac{\text{5.242 Lakhs}}{\text{65 Lakhs}} \text{ X } 0.20 \text{ X } 100$	1.613%
Retention Ratio	$\frac{\text{5.242 Lakhs - 0.30 Lakhs}}{\text{5.242 Lakhs}}$	0.943

Sustainable Growth Rate = ROE x Retention Ratio
= 1.613% x 0.943 = 1.52%

Question 74:

The formula for determining value of a share based on expected dividend is:

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

Where

P_0 = Price (or value) per share

D_0 = Dividend per share

g = Growth rate expected in dividend

k = Expected rate of return

Hence,

Price estimate before budget announcement:

$$P_0 = \frac{2\times(1+0.05)}{(0.10-0.05)} = ₹\ 42.00$$

Price estimate after budget announcement:

$$P_0 = \frac{1.80\ \times\ (1.05)}{(0.07 - 0.05)} = ₹\ 94.50 \text{ or } P_0 = \frac{2.00\ \times\ 1.05 - 0.20}{(0.07 - 0.05)} = ₹\ 95.00$$

Question 81:

i. No. of Bonus Shares to be issued:

Free Float Capitalization	= ₹ 45 crore
Market Price Per Share	= ₹ 150
Shares of Minority	$= \frac{₹\ 45\ \text{crore}}{₹150} = 30$ lacs
Minority Share Holding (100% - 80%)	= 20%
Hence Total shares	$= \frac{30\ \text{lacs}}{0.20} = 150$ lacs
Promoters holding 80%,	= 120 lacs shares
Shares remains the same, but holding % to be taken as 75%	
Hence Total shares	$= \frac{120\ \text{lacs}}{0.75} = 160$ lacs
Shares of Minority	= 160 lacs – 120 lacs = 40 lacs

Bonus 10 lacs for 30 lacs i.e. 1 shares for 3 shares held.

ii. Market price after Bonus issue:

Let us compute PE with given ke as follows:

$$PE = \frac{1}{k_e} = \frac{1}{0.20} = 5$$

Market Price Given = ₹ 150

Hence EPS will be (₹ 150/5) = ₹ 30
Total No. of shares before bonus issue = 150 lacs
Accordingly, Total PAT shall be (₹ 30 x 150 lacs) = ₹ 4500 lacs
Total No. of shares after bonus issue = 150 lacs + 10 lacs = 160 lacs
EPS after Bonus Issue = ₹ 4500 lacs/ 160 lacs = ₹ 28.13
Market Price After Bonus Issue = ₹ 28.13 x 5 = ₹ 140.65

iii. Free Float Capitalization after Bonus Issue

₹ 140.65 x 40 lacs = ₹ 5,626 lacs i.e. ₹ 56.26 crore