

CA INTER



FIM

MCQ

MARATHON



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COST OF CAPITAL

Question 1:

Tiago Ltd is an all - equity company engaged in manufacturing of batteries for electric vehicles. There has been a surge in demand for their products due to rising oil prices. The company was established 5 years ago with an initial capital of Rs. 10,00,000 and since then it has raised funds by IPO taking the total paid up capital to Rs. 1 crore comprising of fully paid - up equity shares of face value Rs. 10 each. The company currently has undistributed reserves of Rs. 60,00,000. The company has been following constant dividend payout policy of 40% of earnings. The retained earnings by company are going to provide a return on equity of 20%. The current EPS is estimated as Rs 20 and prevailing PE ratio on the share of company is 15x. The company wants to expand its capital base by raising additional funds by way of debt, preference and equity mix. The company requires an additional fund of Rs. 1,20,00,000. The target ratio of owned to borrowed funds is 4:1 post the fund - raising activity. Capital gearing is to be kept at 0.4 x.

The existing debt markets are under pressure due to ongoing RBI action on NPAs of the commercial bank. Due to challenges in raising the debt funds, the company will have to offer Rs. 100 face value debentures at an attractive yield of 9.5% and a coupon rate of 8% to the investors. Issue expenses will amount to 4% of the proceeds.

The preference shares will have a face value of Rs. 1000 each offering a dividend rate of 10%. The preference shares will be issued at a premium of 5% and redeemed at a premium of 10 % after 10 years at the same time at which debentures will be redeemed.

The CFO of the company is evaluating a new battery technology to invest the above raised money. The technology is expected to have a life of 7 years. It will generate a after tax marginal operating cash flow of Rs.25,00,000 p.a.

Assume marginal tax rate to be 27%.

You are required to compute

- a) Which of the following is best estimate of cost of equity for Tiago Ltd
 - 12.99%
 - 11.99%
 - 13.99%
 - **14.99%**
- b) Which of the following is the most accurate measure of issue price of debentures
 - 100
 - 96
 - **90.58**
 - 95.88
- c) Which of the following is the best estimate of cost of debentures to be issued by the company? (Using approximation method)
 - **7.64%**
 - 6.74%
 - 4.64%
 - 5.78%
- d) Calculate the cost of preference shares using approximation method
 - 10.23%
 - 9.77%
 - 12.12%

- 11.22%
- e) Which of the following best represent the overall cost of marginal capital to be raised
 - 11.76%
 - 17.16%
 - 16.17%
 - 16.71%

Solution

1. (d) 14.99%

B = retention ratio=0.6, r=return on equity=20%, DPS=D0=20 x 0.4= 8,
 MPS = P0 = EPS x PE = 20 x 15=300
 G = b.r=0.6 x 20% = 12%
 D1 = D0(1+g) = 8 (1.12) = 8.96
 Ke = D1/P0 + g = 8.96/300 + 0.12 = 14.99%

(c) 90.58

Price of debentures= PV of future cash flows for investor discounted at their yield
 = 8 x PVAF(9.5%,10 years)+ 100 x PVF(9.5%, 10 years)
 = 8 x 6.2788 + 100 x 0.4035
 =50.2304 + 40.35
 =90.58

(a) 7.64%

NP = 90.58 x 96%=86.96, RV= 100, Interest=8, t=0.27, n= 10

$$K_d = \frac{\text{Int}(1-t) + (RV - NP)/n}{(RV + NP)/2}$$

$$= \frac{8(1-0.27) + (100 - 86.96)/10}{(100 + 86.96)/2}$$

$$= 7.64\%$$

(b) 11.22%

$$K_p = \frac{PD + (RV - NP)/n}{(RV + NP)/2}$$

$$= \frac{100 + (1100 - 950)/10}{(1100 + 950)/2}$$

(a) 11.76%

	Existing	Total	Additional	
Equity Funds	1,60,00,000	2,00,00,000	40,00,000	
Preference Shares		24,00,000	24,00,000	
Debt		56,00,000	56,00,000	
	1,60,00,000	2,80,00,000	1,20,00,000	
Capital gearing =	0.4			
(PSC + Debt)/Equity =	0.4			
(Total Funds -Equity)/Equity = 0.4				
(2.8 crores-Equity)/equity = 0.4				
Equity =	2 crores			



Weighted avg cost of marginal capital		Weights	Cost	W.C
Equity Funds	40,00,000	0.3333333333	14.99%	5.00%
Preference Shares	24,00,000	0.2	11.22%	1.53%
Debt	56,00,000	0.4666666667	7.64%	5.24%
Total	1,20,00,000			11.76%

Question 2:

M/s ARC Ltd is an established entity in the telecommunication industry with 49.95% market share. Most of its telecommunication lines are based on 2G, 3G and 4G spectrum. However now the market is foreseeing a technological disruption in the form of 5G technology. To maintain a competitive advantage, it needs to heavily invest in 5G equipments and deploy the same for users latest by the end of year 3 from now. The entire project is going to cost 9,000 crores. The management is wondering how such a huge amount is going to be raised.

A financial consultant has recently been hired by ARC to evaluate the various ways to raise capital. On the basis of his experience and knowledge, the consultant is of the view that telecom industry should not deploy fixed cost funds in excess of 40% of total capital. Also, preference share capital should not exceed 10% of total capital. ARC currently has 2000 crores in the form of reserves represented by short term money market instruments. It can raise money by way of debentures by issuing them at a premium of 5% with redemption value of Rs. 110 after 5 years. The debentures would require an annual interest payment of Rs. 8 p.a. The preference shares will be issued at a discount of 10% and redeemed at premium of 10% after 10 years requiring an annual dividend of 10%. The company is sceptical of cash flows in near term after deployment of 5G and therefore would issue the above stated debentures only to the extent of 50% of total debt funds and balance will be raised by zero coupon bonds, which will be issued at a discount of 40% and redeemed at par after 5 years. Current price of share of ARC stands at an average of Rs. 147. The company has recently paid dividend of Rs. 11 per share and considering the 5G deployment and other technological requirements in long run, it is likely to continue retaining 56% of its earnings. The reinvested retained earnings are likely to offer a return of 15% to the shareholders. It is planning to raise a part of additional equity by way of rights offering to its shareholders. The rights entitle the existing shareholders to buy shares at a discount of 15% to current average market price. However only 40% of the required fresh equity can be raised by way of right issue. The balance equity portion will be raised by way of new series of equity shares with differential voting rights. They will be promised a dividend of 1.25x of ordinary equity shareholder and due to lower voting rights their cost of capital will require a premium of 50% over ordinary equity shares.

You are required to compute

- What will be the amount (in Rs. Crore) of differential voting rights shared to be issued assuming that maximum limits are to be adhered to:
 - **2040**
 - 1360
 - 2000
 - 900
- Calculate the cost of debenture using YTM Method
 - 10.76%
 - **8.43%**
 - 12.37%
 - 16.51%
- Calculate the cost of preference shares using YTM Method
 - 10.76%
 - 8.43%
 - **12.37%**
 - 16.51%
- What will be the share price of shares with differential voting rights?



- 91.07
 - 100
 - 124.95
 - 147
- e) What is the minimum required return from 5G deployment or breakeven the cost of capital?
- 10.76%
 - 8.43%
 - **16.11%**
 - 16.51%

Solution

Capital Structure		Amount (Rs.)
Rights issue	4:6	1,360
DVR Equity Issue		2,040
Retained earnings	Fixed	2,000
Preference Shares	10%	900
Debentures	30% (1:1)	1,350
Zero Coupon Bonds		1,350
Total		9,000

year	Cashflows	PVF @ 8%	PV @ 8%	PVF @ 9%	PV @ 9%
1 to 5	8	3.9927	31.94	3.8897	31.12
5	110	0.6806	74.87	0.6499	71.49
cash outflow			106.81		102.61
cash inflow	90	1	105		105
NPV			-1.81		2.39

year	Cashflows	PVF @ 12%	PV @ 12%	PVF @ 13%	PV @ 13%
1 to 10	10	5.6502	56.5	5.4262	54.26
10	110	0.322	35.42	0.2946	32.4
cash outflow			91.92		86.67
cash inflow	90	1	90		90
NPV			-1.92		3.33



Calculation of Cost of Equity

Existing Shareholders

$P_o = 147$

$D_o = 11$

$b = 56\%$

$r = 15\%$

$\text{Growth rate (g)} = b \times r = 8.40\%$

$D_1 = 11 \times (1+8.4\%) = 11.924$

$K_e = 11.924/147 + 8.4\%$
 $= 16.51\%$

Rights Shares

$P_o = 147 \times 85\% = 124.95$

$D_o = 11$

$b = 56\%$

$r = 15\%$

$\text{Growth rate (g)} = b \times r = 8.40\%$

$D_1 = 11 \times (1+8.4\%) = 11.924$

$K_e = 11.924/124.95 + 8.4\%$
 $= 17.94\%$

Differential Voting rights

$K_e = 16.51\% \times 1.5 = 24.77\%$

$D_1 = 11.924 \times 1.25 = 14.905$

$G = 8.40\%$

$P_o = 14.905 / (24.77\% - 8.40\%)$

$P_o = 91.07$

Capital Structure		Amount(Rs.)	Weight	Cost	W x C
Rights issue	4:6	1360	0.1511	17.94%	0.0271
DVR Equity Issue		2040	0.2267	24.77%	0.0561
Retained earnings	Fixed	2000	0.2222	16.51%	0.0367
Preference Shares	10%	900	0.1	12.37%	0.0124
Debentures	30% (1:1)	1350	0.15	8.43%	0.0126
Zero Coupon Bonds		1350	0.15	10.76%	0.0161
Total		9000	1		16.11%



Question 3:

Ranu & Co. has issued 10% debenture of face value 100 for Rs. 10 lakh. The debenture is expected to be sold at 5% discount. It will also involve floatation costs of Rs. 10 per debenture. The debentures are redeemable at a premium of 10% after 10 years. Calculate the cost of debenture if the tax rate is 30%.

- 8.97%
- 9.56%
- 8.25%
- 10.12%

Solution

(a) 8.97%

$$K_d = \frac{[1 + \frac{1}{n}(RP - NP)](1 - t)}{1/2(RP + NP)}$$

$$K_d = \frac{[10 + \frac{1}{10}(110 - 85)](1 - 0.30)}{1/2(110 + 85)}$$

$$= 8.75/97.5 = 8.97\%$$

Question 4:

AHF Ltd. is a well-established organization known for its innovative products and services. With a strong financial standing and a commitment to growth, the company is exploring different financing options to fuel its expansion strategies. AHF Ltd. is considering issuing debentures to raise funds for expansion and investment opportunities. The company aims to determine the cost of debt after tax under various scenarios of issuance, considering factors such as issue price and brokerage expenses.

CA Aananda, Chief Financial Officer of AHF Ltd. plans to issue 12,00,000, 15% debentures of X100 each, redeemable after a fixed period of 10 years. The company operates in a 35% tax bracket, which will impact the cost of debentures after tax.

The cost of debt after tax is calculated by adjusting the coupon rate for tax savings on interest payments. Additionally, brokerage expenses, if applicable, are factored into the analysis to determine the overall cost of debentures.

By analysing the cost of debt under different issuance scenarios, CA Aananda can make informed decisions regarding its financing strategy. Understanding the impact of issue price and brokerage expenses on the cost of debentures enables the company to optimize its capital structure and enhance shareholder value. Continuous evaluation of financing options and market conditions will be essential for AHF Ltd. to maintain financial flexibility and support its long-term growth objectives.

Calculate Cost of Debentures after tax and help CA Aananda, CFO of AHF Ltd. to understand the various scenarios.

What will be the cost of debenture if the debentures issued at par

- 9.25%
- 15%
- 7.80%
- 9.75%

What will be the cost of debenture if the debentures issued at 10% discount

- 10.95%
- 11.32%
- 8.33%
- 10%

What will be the cost of debenture if the debentures issued at 10% premium

- 8.33%
- 8.66%
- 10.23%
- 11.32%

What will be the cost of debenture if the brokerage is paid at 2% and issue as par

- 8.33%
- 15.35%
- 10.05%
- 9.98%

What will be the cost of debenture if the debenture's current market price is Rs. 120 and are redeemed at par

- 7%
- 7.05%
- 7.68%
- 9.75%

Solution

$$\text{Cost of Debentures, } K_d = \frac{I(1-t) + \frac{RV-NP}{n}}{\frac{RV+NP}{2}} \times 100$$

I = Interest on debentures

t = Tax Rate

RV = Redemption Value

NP = Current Market Price or Net Proceed received

n = Period of debenture

cost of debenture if the debentures are issued at par.

$$\text{Cost of Debentures, } K_d = \frac{15(1-0.35) + \frac{(100-100)}{10}}{\frac{(100+100)}{2}} \times 100 = 9.75\%$$

$$\text{Cost of Debentures, } K_d = \frac{15(1-0.35) + \frac{(100-90)}{10}}{\frac{(100+90)}{2}} \times 100 = 11.32\%$$

$$\text{Cost of Debentures, } K_d = \frac{15(1-0.35) + \frac{(100-110)}{10}}{\frac{(100+110)}{2}} \times 100 = 8.33\%$$

$$\text{Cost of Debentures, } K_d = \frac{15(1-0.35) + \frac{(100-98)}{10}}{\frac{(100+98)}{2}} \times 100 = 10.05\%$$

$$\text{Cost of Debentures, } K_d = \frac{15(1-0.35) + \frac{(100-120)}{10}}{\frac{(100+120)}{2}} \times 100 = 7.05\%$$

Question 5:

A company recently issued 9% preferred shares. The preferred shares sold for Rs. 40 a share with a par of Rs. 20. The cost of issuing the stock was Rs. 5 a share. What is the company's cost of preferred share

- 9%
- 4.5%

- 5.1%
- 10.3%

Solution

Description: Cost of Preferred Share = Dividend / Net Proceeds or Market Price, where Dividend = Rs. 20 x 9% = Rs. 1.8 and Net Proceeds = Rs. 40 - Rs. 5 = Rs. 35. Therefore, cost of Preferred Stock = 1.8 / 35 = 5.1%

Question 6:

A company's equity share is currently selling for Rs. 50 per share. Current year's dividend was Rs. 2 per share and the earnings of the company is expected to increase by 5%. What is the firm's cost of existing equity

- 9.2%
- 4.2%
- 14%
- 9%

Solution

Description: Cost of existing equity can be calculated by using Gordon's growth model with the following formula: Cost of existing equity = (Next expected dividend / Current stock price) + Expected growth in earnings. Next expected dividend = Current year's dividend + Expected increase in dividend = 2 + 5% (2) = 2.1. Thus, cost of existing equity = (2.1 / 50) + 5% = 9.2%

Question 7:

With retention ratio of 60% and return on equity of 15.5%, the growth rate shall be

- 14.90%
- 9.30%
- 25.84%
- 16.10%

Solution

Description: Growth rate can be calculated using Gordon growth model using formula $G = b \times r$ where b represents earning retention ratio and r represents rate of return. Hence, $G = 0.60 \times 0.155 = 0.093$ or 9.3%.

Question 8:

Given risk-free rate of return = 5%; market return = 10%; cost of equity = 15%; value of beta (β) is:

- 1.9
- 1.8
- 2.0
- 2.2

Solution**Question 9:**

A company has a financial structure where equity is 70% of its total debt plus equity. Its cost of equity is 10% and gross loan interest is 5%. Corporation tax is paid at 30%. What is the company's weighted average cost of capital (WACC)?

- 7.55%
- 7.80%
- 8.70%
- 8.05%

Solution

Question 10:

What is the overall (weighted average) cost of capital when the firm has Rs. 20 crores in long-term debt, Rs. 4 crores in preferred stock, and Rs. 16 crores in equity shares? The before-tax cost for debt, preferred stock, and equity capital are 8%, 9%, and 15%, respectively. Assume a 50% tax rate.

- 7.60%
- 6.90%
- 7.30%
- **8.90%**

Solution**Question 11:**

Kaivalyabodhi Limited (KbL) has completed 35 years of operations in India. It has many subsidiary & associate companies in more than 100 countries. KbL's business s include home and personal care, foods and beverages, and industrial, agricultural and other products. It is one of the largest producers of soaps and detergents in India. The company has grown organically as well as through acquisitions. Over the years, the company has built a diverse portfolio of powerful brands, some being household names.

It is planning to acquire one of its competitors named Prestige Limited, which would enhance the growth of 'KbL'. The consideration amount will be 1.5X of its average Market Capitalization. Prestige limited has 1,30,000 outstanding equity shares and its shares were traded at an average market price of Rs. 45 as on the valuation date. The consideration amount will be paid equally in 5 years where the first installment is to be paid immediately. Prestige Limited has K_o of 15%

KbL will raise the funds required through debt and equity in the ratio of 30:70. The company requires the cost of capital estimates for evaluating its acquisitions, investment decisions and the performance of its businesses.

KbL's share price has grown from Rs. 150 to Rs. 301 in the last 5 years and it will continue to grow at the same rate. KbL pays dividends regularly. The company has recently paid a dividend of Rs. 8. For the calculation of equity, an average of 52 weeks high market price in the last 5 years is to be considered, which is as follows:

Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
MPS 185	MPS 210	MPS 252	MPS 325	MPS 280

K_e calculated as per growth model holds a weight of 0.6.

The company also wishes to calculate the equity's expectation using CAPM which holds a weight of 0.4. The risk-free rate is assumed as the yield on long-term government bonds that the company regards as about 8%. KbL regards the market- risk premium to be equal to 11 per cent. Its estimation on the Beta is 0.78.

KbL will issue debentures with FV of Rs. 10,500 which is to be amortised equally over the life of 7 years. The company considers the effective rate of interest applicable to an 'AAA' rated company with a markup of 200 basis points as its coupon rate. It thinks that considering the trends over the years, 'AAA' rate is 7.5%.

Ignore taxation. Based on the above details, answer the question 1 to 5:



1. Calculate the cost of equity under both the methods
 - (a) 11%, 16%
 - (b) 18.65%, 10.34%
 - (c) 18.65%, 16.58%
 - (d) 16.5%, 9%
2. Calculate the overall cost of equity
 - (a) 17.82%
 - (b) 17.63%
 - (c) 15.37%
 - (d) 35.25%
3. Calculate the cost of debt, if the intrinsic value of debenture today is close to Rs. 9,740
 - (a) 15%
 - (b) 12%
 - (c) 9.5%
 - (d) 7.5%
4. Calculate the WACC & the amount of purchase consideration
 - (a) 18%, Rs. 90,00,000
 - (b) 15.21%, Rs. 87,75,000
 - (c) 16.07%, Rs. 87,75,000
 - (d) 15.94%, Rs. 58,50,000
5. Present Value of Purchase consideration is close to Rs.
 - (a) 58,83,032
 - (b) 67,65,487
 - (c) 57,35,680
 - (d) 66,58,997

Solution

(c) 18.65%, 16.58%

Ke under two approaches

Calculation of Ke (Using Gordon's Model)

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

Share Price has grown from 150 to 301 in 5 years,

$$150 (1 + g)^5 = 301.$$

$$(1 + g)^5 = 2.01$$

Therefore, $g = 15\%$, (From Annuity table – Re 1 after 5 years becomes ₹ 2.01 at rate of 15%)

$$D_1 = 8 + 15\% \text{ of } 8 = 9.2$$

Po = Average of 52 weeks High price in last 5 years

$$P_0 = (185 + 210 + 252 + 325 + 280) / 5 \\ = 252.40$$

$$K_e = 9.2 / 252.40 + 0.15 \\ = 18.65\%$$

Calculation of Ke (Using CAPM)

$$K_e = R_f + (R_m - R_f) \times \text{Beta} \\ = 8 + (11 \times 0.78) \\ = 16.58\%$$

(a) 17.82%

Overall Ke for the company

Approach	Cost of Equity (k)	Weight (w)	K x w
Gordon's	18.65%	0.6	11.19%
CAPM	16.58%	0.4	6.63%
			Total Ke = 17.82%

3. (b) 12%

Intrinsic Value of Debentures today is ₹ 9,740

WN 1 – Calculation of the Pattern of Future Cash flows

YR	PRINCIPAL (I)	INTEREST (II) = Coupon Rate = 9.5% (7.5% + 2%)	PV OF (I + II) @ 10%	PV OF (I + II) @ 15%
1	1,500	997.50	2270.45	2171.74
2	1,500	855	1946.28	1780.72
3	1,500	712.5	1662.28	1454.75
4	1,500	570	1413.84	1183.53
5	1,500	427.50	1196.83	958.31
6	1,500	285	1007.59	771.70
7	1,500	142.50	842.86	617.48
			10340.13	8938.23

$$= 10\% + \frac{(10,340.13 - 9,740)}{(10,340.13 - 8,938.23)} \times 5\% = 12.14\% = 12\% \text{ (approx.)}$$

4. (c) 16.07%, ₹ 87,75,000

$$K_o = W_d \times K_d + W_e \times K_e$$

$$= 0.3 \times 12 + 0.7 \times 17.82$$

$$= 16.07\%$$

Purchase Consideration using M-Cap method

$$= 1,30,000 \text{ eq shares} \times 45 \text{ MPS} \times 1.5X$$

$$= ₹ 87,75,000$$

5. (d) ₹ 66,58,997

It is to be paid equally over 5 years and first instalment is to be paid immediately at Yr 0

Discount rate will be the K_o calculated as above of the company and not 15% which is K_o of Prestige Limited

Year	Amount each year	PV @ 16.07%	PV (₹)
0	17,55,000	1.0000	17,55,000
1	17,55,000	0.8615	15,11,933
2	17,55,000	0.7423	13,02,737
3	17,55,000	0.6395	11,22,323
4	17,55,000	0.5510	9,67,005
	TOTAL PV		66,58,997

Question 12:

A company has issued bonds with a face value of Rs. 100,000 at an annual coupon rate of 8%. The bonds are currently trading at 95% of their face value. What is the approximate cost of debt for the company before taxes.

(a) 9.00%

(b) 7.65%

(c) 8.00%

(d) 8.42%

Solution

(d) Calculation: Cost of Debt = (Interest Payment/ Market Price of Bond)
= (8,000 / 95,000) = 8.42%

Question 13:

A company's debt equity ratio is 3:5. Pretax cost of debt and equity are 7% and 10% respectively. What is the weighted average cost of capital if the tax rate is 30%?

- (a) 12.21%
- (b) 17%
- (c) 14.9%
- (d) 8.09%

Solution

Description: Weighted average cost of capital is calculated by proportionally weighing each category of capital including debt, preferred stock and common stock. Cost of debt is calculated after tax, because of benefit of tax deduction on interest paid. The calculation for weighted average cost of capital (WACC) will be as follows: After tax cost of debt = $7 (1 - \text{Tax rate}) = 7 \times (1 - 0.30) = 4.9\%$, Cost of equity = 10%. Thus, weighted average cost of capital (after assigning weights) = $(4.9\% \times 3 / 8) + (10\% \times 5 / 8) = 8.09\%$.

Question 14:

A company is considering a project with an initial cost of Rs.1 million. The project is expected to generate cash flows of Rs.500,000 per year for 5 years. The company's cost of capital is 12%. What is the project's net present value?

- (a) 7,99,610
- (b) 10,24,323
- (c) 10,93,515
- (d) 11,68,916

Solution



Chapter no :

2**LEVERAGES****Question 1:**

A firm has sales of Rs. 75,00,000, variable cost of Rs. 42,00,000 and fixed cost of Rs. 6,00,000. It has a debt of Rs. 45,00,000 at 9% and equity of Rs. 55,00,000. Does it have favourable financial leverage?

- (a) ROI is less than interest on loan funds and hence it has no favourable financial leverage.
- (b) ROI is equal to interest on loan funds and hence it has favourable financial leverage.
- (c) ROI is greater than interest on loan funds and hence it has favourable financial leverage.
- (d) ROI is greater than interest on loan funds and hence it has unfavourable financial leverage.

Solution

- (c) ROI is greater than interest on loan funds and hence it has favourable financial leverage.

$$\text{EBIT} = 75,00,000 - 42,00,000 - 6,00,000 = 27,00,000,$$

$$\text{ROI} = 27,00,000 / (45,00,000 + 55,00,000) = 27\%,$$

Rate of Interest lower than Return on investment.

Therefore, there is favourable leverage.

Question 2:

X Ltd has actual Sales of Rs. 20 lakhs and its Break-even sales are at Rs. 15 lakhs. The degree of total risk involved in the company is 6.5. Calculate the % impact on EPS, if EBIT is affected by 12%.

- a. 40%
- b. 78%
- c. 312%
- d. 19.5%

Solution

(d) 19.5%

Financial Leverage (FL) indicates % impact in EPS, if EBIT is affected by 12%

FL = Combined Leverage (CL) / Operating Leverage (OL)

CL = 6.5 (Measure of total risk)

OL = 1 / Margin of Safety

Margin of Safety (MOS) = $\frac{\text{Actual Sales} - \text{B.E Sales}}{\text{Actual Sales}}$

MOS = 20 lakhs – 15 lakhs / 20 lakhs = 0.25

Therefore, OL = 1 / 0.25 = 4

So, FL = 6.5 / 4 = 1.625

So % Change in EPS = 12 x 1.625 = 19.5%

Question 3:

Given Data: Sales is Rs. 10,00,000, Break even sales is Rs. 6,00,000. What is the Degree of operating leverage?

- (a) 3
- (b) 2
- (c) 2.5
- (d) 2.2

Solution**(c) 2.5**

Margin of safety = (sales – BEP sales)/sales x 100
= 40%

Degree of operating leverage = 1/MOS
= 1/40% = 2.5

Question 4:

"If EBIT increases by 6%, net profit increases by 6.9%. If sales increase by 6%, net profit will increase by 24%.

Financial leverage must be....."

- (a) 1.19
- (b) 1.13
- (c) 1.12
- (d) 1.15

Solution**D. 1.15**

FL = % change in NP / % change in EBIT = 6.9/6 = 1.15

Question 5:

Mathangi Ltd. is a News broadcasting channel having its broadcasting Centre in Chennai. There are total 200 employees in the organisation including top management. As a part of employee benefit expenses, the company serves tea to its employees, which is outsourced from a third-party. The company offers tea three times a day to each of its employees. The third-party charges Rs. 10 for each cup of tea. The company works for 200 days in a year.

Looking at the substantial amount of expenditure on tea, the finance department has proposed to the management an installation of a master tea vending machine from Nirmal Ltd which will cost Rs. 5,00,000 with a useful life of five years. Upon purchasing the machine, the company will have to incur annual maintenance which will require a payment of Rs. 25,000 every year. The machine would require electricity consumption of 500 units p.m. and current incremental cost of electricity for the company is Rs. 24 per unit. Apart from these running costs, the company will have to incur Rs. 8,00,000 for consumables like milk, tea powder, paper cup, sugar etc. The company is in the 25% tax bracket. Straight line method of depreciation is allowed for the purpose of taxation.

Nirmal Ltd sells 100 master tea vending machines. Variable cost is Rs. 4,50,000 per machine and fixed operating cost is Rs. 25,00,000. Capital Structure of Mathangi Ltd and Nirmal Ltd consists of the following –

Particulars	Mathangi Ltd.	Nirmal Ltd.
Equity Share Capital (Face value Rs. 10 each)	40,00,000	40,00,000
Reserves & Surplus	25,00,000	50,00,000
12% Preference Share Capital	12,00,000	Nil
15% Debentures	20,00,000	40,00,000

Risk free rate of return = 5%, Market return = 10%, Beta of the Mathangi Ltd. = 1.9

You are required to answer the following five questions based on the above details:

1. If sales of Nirmal Ltd are up by 10%, impact on its EBIT is

- (a) 30%
- (b) 60%
- (c) 5%
- (d) 20%

2. Combined leverage of Nirmal Ltd is

- (a) 1.63
- (b) 2.63
- (c) 1.315
- (d) 2

3. Discount rate that can be applied for making investment decisions of Mathangi Ltd is

- (a) 12%
- (b) 13.52%
- (c) 15%

(d) 20%

4. Incremental cash flow after tax per annum attributable to Mathangi Ltd due to investment in the machine is

(a) Rs. 2,39,438

(b) Rs. 1,98,250

(c) Rs. 98,250

(d) Rs. 1,31,000

5. Net present value of investment in the machine by Mathangi Ltd is

(a) Rs. 6,88,522

(b) Rs. 1,88,522

(c) Rs. 9,91,250

(d) Rs. 4,91,250

Solution

1. (d)

2. (b)

Particulars	Computation	Result
Sales	$100 \times 5,00,000$	5,00,00,000
Less Variable cost	$100 \times 4,50,000$	4,50,00,000
Contribution		50,00,000
Less Fixed cost		25,00,000
EBIT		25,00,000
Less Interest	$15\% \times 40,00,000$	6,00,000
EBT		19,00,000

Operating leverage = $\text{Contribution} \div \text{EBIT} = 50 \text{ Lakhs} \div 25 \text{ Lakhs} = 2$ times

Operating leverage = % Change in EBIT \div % Change in Sales i.e. if sales increase by 10%, EBIT increase by 20%.

Financial leverage = $\text{EBIT} \div \text{EBT} = 25 \text{ Lakhs} \div 19 \text{ Lakhs} = 1.315$ times

Combined leverage = Operating leverage \times Financial leverage
 $= 2 \times 1.315 = 2.63$ times

3. (b)

Particulars	Weights	Cost in %	Weights \times Cost
Share Capital	40,00,000	$5 + 1.9 \times (10 - 5) = 14.5$	5,80,000
Reserves & Surplus	25,00,000	14.5	3,62,500
Preference Share Capital	12,00,000	12	1,44,000
15% Debentures	20,00,000	$15 \times (1 - 25\%) = 11.25$	2,25,000
Total	97,00,000	Total Cost	13,11,500

Discount rate = WACC = $13,11,500 \div 97,00,000 \times 100 = 13.52\%$



4. (b)

Particulars	Computation	Result
Savings in Tea cost	200 Employees × 200 days × 3 times × ₹ 10	12,00,000
Less: Annual maintenance		(25,000)
Less: Cost of Electricity	500 units × ₹ 24 per unit × 12 months	(1,44,000)
Less: Consumables		(8,00,000)
Less: Depreciation	5,00,000 ÷ 5 years	(1,00,000)
Profit before tax		1,31,000
Less: Tax	1,31,000 × 25%	32,750
Profit after tax		98,250
Add: Depreciation		1,00,000
Cash flow after tax	98,250 + 1,00,000	1,98,250

5. (b)

Year	Particulars	Cash flow	PVF@13.52%	PV
0	Initial investment	5,00,000	1	(5,00,000)
1 to 5	Savings	1,98,250	3.473	6,88,522
	Net present value			1,88,522

Question 6:

Given

Operating fixed costs	Rs. 20,000
Sales	Rs. 1,00,000
P/ V ratio	40%

The operating leverage is:

- (a) 2.00
 (b) 2.50
 (c) 2.67
 (d) 2.47

Solution

Question 7:

If EBIT is Rs. 15,00,000, interest is Rs. 2,50,000, corporate tax is 40%, degree of financial leverage is;

- (a) 1.11
- (b) **1.20**
- (c) 1.31
- (d) 1.41

Solution**Question 8:**

If DOL is 1.24 and DFL is 1.99, DCL would be:

- (a) 2.14
- (b) 2.18
- (c) 2.31
- (d) **2.47**

Solution**Question 9:**

From the following information, calculate combined leverage:

Sales	Rs. 20,00,000
Variable Cost	40%
Fixed Cost	Rs. 10,00,000
Borrowings	Rs. 10,00,000 @ 8% p.a.

- (a) **10 times**
- (b) 6 times
- (c) 1.667 times
- (d) 0.10 times

Solution**Question 10:**

If Margin of Safety is 0.25 and there is 8% increase in output, then EBIT will be:

- (a) Decrease by 2%
- (b) **Increase by 32%**
- (c) Increase by 2%
- (d) Decrease by 32%

Solution**Question 11:**

If degree of financial leverage is 3 and there is 15% increase in Earning per share (EPS), then EBIT will be:

- (a) Decrease by 15%
- (b) Increase by 45%
- (c) Decrease by 45%
- (d) **Increase by 5%**

Solution**Question 12:**

If degree of combined leverage is 3 and margin of safety is 0.50, then degree of financial leverage is:

- (a) 6.00
- (b) 3.00
- (c) 0.50
- (d) **1.50**

Solution**Question 13:**

Output (units) = 3,00,000 Fixed cost = 3,50,000 Unit variable cost = 1.00 Interest expenses = ₹25,000
Unit selling price = 3.00 Applicable tax rate is 35% Calculate Financial Leverage

- (a) 1.11
- (b) 2.40
- (c) 2.67
- (d) 1.07

Solution

$$\text{EBIT} = 300000 \times (3 - 1) - 350000 = 250000, \text{ PBT} = 250000 - 25000 - 225000, \text{ FL} = 250000 / 225000 = 1.11$$

Question 14:

A firm has a DOL of 4.5 at Q units. What does this tell us about the firm?

- (a) If sales rise by 4.5%, then EBIT will rise by 1%
- (b) If EBIT rises by 4.5%, then EPS will rise by 1%.
- (c) If EBIT rises by 1%, then EPS will rise by 4.5%.
- (d) If sales rise by 1%, then EBIT will rise by 4.5%

Question 15:

Total assets of Alpha Company are 3,00,000. The company's total assets turnover ratio is 3, its fixed operating cost is ₹ 1,50,00 variable operating cost ratio is 50%.

The income-tax rate is 50%. It also has long term debts of ₹ 1,20,000 on which interest @ 10% is payable. Operating, Financial & Combined Leverages of the company are

- (a) 1.5; 1.042; 1.563 respectively
- (b) 1.05; 1.42; 1.05625 respectively
- (c) 1.50; 1.42; 2.13 respectively
- (d) 1.55; 1.042; 1.6151 respectively

Solution

Sales=300000x3=900000, VC=900000x50%=450000, Contribution= 900000-450000=450000, EBIT= 450000-150000=300000, PBT=300000-120000x10%=288000, OL=450000/300000=1.5, FL=300000/288000=1.042, CL=1.5x1.042=1.563

Question 17:

Operating leverage is 7 and financial leverage is 2.2858. How much change in sales will be required to bring 70% change in EBIT

- (a) 10%
- (b) 70%
- (c) 11.429%
- (d) 30%

Solution

Description:

OL=% change in EBIT/ %change in Sales, For OL of 7, 1%change in sales will cause 7%change in EBIT. For 70% change in EBIT, 10% change in sale is required.

Chapter no :

03**CAPITAL STRUCTURE****Question 1:**

Given:

Earnings available to the equity shareholders Rs. 30 Lakhs, Cost of equity is 15%,

Debt outstanding Rs. 150 Lakhs Value of the firm will be

- (a) Rs. 200 Lakhs
- (b) Rs. 250 Lakhs
- (c) Rs. 350 Lakhs
- (d) 300 lakhs

Solution**(c) ₹ 350 Lakhs**

Value of Equity = 30 Lakhs ÷ 15% = ₹ 200 Lakhs

Value of Debt = ₹ 150 Lakhs

Value of Firm = 200 Lakhs + 150 Lakhs = ₹ 350 Lakhs

Question 2:

Ramu Ltd. wants to implement a project for which Rs. 25 lakhs is required. The following financing options are at hand:

Option 1:

Equity Shares 25,000 @ Rs.100

Option 2:

Equity Shares 10,000 @ Rs.100

12% Preference Shares 5,000 @ Rs. 100

10% Debentures 10,000 @ Rs.100

What is the indifference point & EPS at that level of EBIT assuming corporate tax to be 35%.

- (a) Rs.2,94,872; Rs.11.80
- (b) Rs.3,20,513; Rs.8.33
- (c) Rs.2,94,872; Rs.7.67
- (d) Rs.3,20513; Rs.12.82

Solution

B. ₹ 3,20,513; ₹ 8.33

$$\frac{(EBIT - I)(1 - t) - D_p}{N_1} = \frac{(EBIT - I)(1 - t) - D_p}{N_2}$$

$$\frac{(x - 0)(1 - 0.35)}{25,000} = \frac{(x - 1,00,000)(1 - 0.35) - 60,000}{10,000}$$

$$x = EBIT = ₹ 3,20,513$$

At EBIT of ₹ 3,20,513, EPS under both options will be the same i.e., ₹ 8.33 per share

Question 3:

A company is considering changing its capital structure by increasing its debt ratio from 40% to 55%. What is the likely impact on the company's cost of equity, assuming all other factors remain constant?

- (a) Cost of equity will be unaffected by debt ratio
- (b) Cost of equity will remain unchanged
- (c) Cost of equity will decrease
- (d) Cost of equity will increase

Solution

- (d) Cost of equity will increase. As the company increases its debt ratio, the financial risk increases, which typically leads to an increase in the cost of equity as equity investors demand a higher return for the additional risk.

Question 4:

Mr. Dashan recently came back from a conference titled Capital Structure Theory and was extremely excited about what he learned concerning Modigliani and Miller's capital structure propositions. He has been trying to choose between three potential capital structures for his firm, Dashmart Corporation, and believes that Modigliani and Miller's work may guide him in the right direction. The capital structures Munn is considering are:

CSI: 100% equity.

CS II: 50% equity and 50% debt.

CS III: 100% debt.

If he uses Modigliani and Miller's propositions and includes all of their assumptions including the assumption of no taxes, which capital structure is he most likely to choose? Which capital structure would be chosen in case of tax regime?

- (a) CS I and CS II
- (b) CS I and CS III
- (c) CS II and CS III
- (d) Any CS and CS III

Solution



Modigliani and Miller's original study was based on the assumption of perfect markets with no taxes and no costs of financial distress. Their conclusion was that under such assumptions, capital structure has no impact on firm value. MM Proposition with taxes concludes that the optimal capital structure is 100% debt. This is because the tax deductibility of interest payments provides a tax shield that adds value to the firm, and the value of the tax shield is maximized with 100% debt.

Question 5:

Ram Verse Ltd is an all equity financed company. It is considering replacing Rs. 275 lakhs equity shares with 15% debentures of the same amount. Current Market value of the company is 1750 lakhs with cost of capital at 20%. Future EBITs are going to be constant and entire earnings are going to be distributed. Corporate Tax Rate can be assumed to be 30%. What will be the new market value of the firm?

- (a) 1832.5 Lakhs
- (b) 82..50 Lakhs
- (c) 1750 Lakhs
- (d) 1732.50 Lakhs

Solution

Description:

$$\text{Value (L)} = \text{Value (UL)} + \text{Debt} \times t = 1750 + 275 \times 30\% = 1832.5$$

Chapter no :

04**DIVIDEND DECISION****Question 1:**

What should be the optimum Dividend pay-out ratio, when $r = 15\%$ & $K_e = 12\%$:

- (a) 100%
- (b) 50%
- (c) Zero
- (d) None of the above.

Solution**Question 2:**

If the company's D/P ratio is 60% & ROI is 16%, what should be the growthrate?

- (a) 5%
- (b) 7%
- (c) **6.4%**
- (d) 9.6%

Solution**Question 3:**

Compute EPS according to Graham & Dodd approach from the given information:

Market price	Rs. 56
Dividend pay-out ratio	60%
Multiplier	2

- (a) Rs. 30
- (b) Rs. 56
- (c) Rs. 28
- (d) Rs. 84

Solution

Question 4:

The following data are available for R Ltd.

- EPS Rs. 8
- Rate of return of investment 16%
- Rate of return to shareholders 12%

If Gordon's basic valuation formula is applied what will be the price per share when the dividend payout ratio is 50%

- (a) 85.71
- (b) 66.61
- (c) 100
- (d) 78

Solution

$$DPR=50\%,$$

$$DPS=50\% \times 8=4,$$

$$g=16\% \times 0.5=8\%,$$

$$P_0=4/(0.12-0.08)=100.$$

Question 5:

KGF Chemicals Ltd., a prominent player in the chemical industry, faces the challenge of determining its growth trajectory and dividend policy to maximize shareholder value. With expectations of significant growth in the near term and stabilization in the long run, the company must strategically manage its resources to align with investor expectations.

KGF Chemicals Ltd. is a leading manufacturer and supplier of specialty chemicals catering to diverse industries such as pharmaceuticals, agriculture, and manufacturing. Established with a commitment to innovation and quality, the company has garnered a strong market presence over the years.

The company is projected to experience robust growth at a rate of 14% per annum for the next four years. Subsequently, the growth rate is expected to stabilize at the national economy's rate of 7% indefinitely. This forecast reflects both the company's expansion plans and the broader economic landscape.

KGF Chemicals Ltd. paid a dividend of 2 per share last year (Do 2). The management faces the crucial decision of balancing dividend payouts with reinvestment opportunities to sustain growth and meet shareholders' expectations. The dividend policy must strike a delicate balance between rewarding shareholders and retaining earnings for future investments.



The required rate of return on equity shares is 12%, indicating investors' expected return given the company's risk profile and market conditions. Management must carefully assess investment opportunities to ensure they meet or exceed this threshold, thereby generating value for shareholders over the long term.

In navigating the dynamic landscape of the chemical industry, KGF Chemicals Ltd. must adopt a proactive approach to managing growth and dividend policy. By aligning strategic decisions with investor expectations and market dynamics, the company can position itself for sustainable success while maximizing shareholder value. Continual evaluation and adaptation will be essential to capitalize on growth opportunities and maintain competitiveness in the evolving marketplace.

You are required to answer the following on the basis of above information:

- i) What is the expected dividend at the end of 4th year?
 - (a) 2.1097
 - (b) 2.1483
 - (c) 2.9631
 - (d) 3.3779
- ii) What is the present value of expected dividends to be received in next four years
 - (a) 11.2202
 - (b) 8.3655
 - (c) 9.843
 - (d) 6.2176
- iii) Determine the market price of shares at the end of 4th year
 - (a) 72.28
 - (b) 67.55
 - (c) 50.67
 - (d) 77.34
- iv) Determine the present value of market price of shares at the end of 4th year?
 - (a) 49.18
 - (b) 32.22
 - (c) 45.79
 - (d) 42.96
- v) Calculate today's market price of the share
 - (a) 59.03
 - (b) 54.33
 - (c) 57.01
 - (d) 57.54

Solution

(A)

Year	$D_1 = D_0(1+g)$	PV Discount Factor @ 12%	PV in ₹
1	$2(1+14\%) = 2.28$	0.893	2.0364
2	$2.28(1+14\%) = 2.5992$	0.797	2.0715
3	$2.5992(1+14\%) = 2.9631$	0.712	2.1097
4	$2.9631(1+14\%) = 3.3779$	0.636	2.1483
(A) Total PV of Expected Dividend			₹ 8.3655

$$P_4 = \frac{D_5}{K_s - g} = \frac{D_4(1+g)}{K_s - g} = \frac{3.3779(1+7\%)}{12\% - 7\%}$$

$$= ₹ 72.28$$

(B) PV of share at the end of 4th Year = ₹ 72.28 × 0.636 = ₹ 45.97

(C) Market Price of shares = ₹ 8.3655 + ₹ 45.97 = ₹ 54.33

Question 6:

The cost of capital of a firm is 12% & its expected earning per share at the end of the year is Rs 20. its existing payout ratio is 25%. the company is plann to increase its payout ratio to 50% what will be the effect of this change on the market price of equity share (MPS) of the company as per Gordon model, if the reinvestment rate of the company is 15%

- It will increase by Rs 444.45
- It will decrease by Rs 444.45
- It will increase by Rs 222.22
- It will decrease by Rs 222.22

Solution

Description: Current $D_1 = 20 \times 25\% = 5$, Current $g = 0.75 \times 0.15 = 11.25\%$, Current $MPS = 5 / (0.12 - 0.1125) = 666.67$ Proposed $D_1 = 20 \times 50\% = 10$, proposed $g = 0.5 \times 0.15 = 0.075$, Proposed $MPS = 10 / (0.12 - 0.075) = 222.22$ Change in $MPS = 666.67 - 222.22 = 444.45$

Question 7:

If a firm declared 25% dividend on share of face value of Rs 10 its growth rate is 5% & its rate of capitaliation is 12% its expected price would be Rs...

- 31.2
- 33.50
- 36
- 37.50

Solution

Description:

$$D1 = 10 \times 25\% \times 1.05 = 2.625. P_0 = 2.625 / (0.12 - 0.05) = 37.5$$

Question 8:

Determine the market price of share of XYZ Ltd as per Gordon's model, given equity capitalisation rate = 11% expected earning Rs. 20 rate of return on investment = 10% & retention ratio = 30%

- (a) 165
- (b) 175
- (c) 185
- (d) 195

Solution

Description:

$$g = 0.3 \times 10\% = 3\%, D1 = 20 \times 0.7 = 14, P_0 = 14 / (0.11 - 0.03) = 175$$

Investment Decisions

QUESTION 1:

Mr. Ronak, a doctor by profession, has his own private hospital at Goa having specialization in cardiac treatments. However, now-a-days, Goa not only being a place for the tourists, but is also a place for business delegates, cultural people, politicians, students and other classes of people. Gradually, Goa is opening new windows for businesses and getting recognition as an important tourist and leisure hub in South West India.

There are a number of hotels and resorts at Goa. However, the need still exists for more hotel services, in particular with the excellent service, and because of the large number of visitors from all over the country and all walks of life always favour Goa state for their recreation.

Mr. Ronak although being a doctor by profession is contemplating to establish a five-star hotel at Goa. The hotel will consist of 5 floors. The hotel will include 40 normal rooms and 8 deluxe suites, as well as a restaurant and couple of conference rooms with a small wedding hall on the ground floor. Following are the estimated occupancy rate including fare composition in the Table 1. Being a five-star hotel, breakfast would be complementary but lunch and dinner are on a-la-carte basis.

Table 1: Hotel accommodation, estimated occupancy rate and fare.

Types of Facility	Numbers	Occupancy Rate	Average Rent Per Room Per Day	Growth Rate in Rent
Normal Room	40	33% or 120 Days	Rs. 8000	12%
Deluxe Suites	8	33% or 120 Days	Rs. 25,000	9%
Conference with Wedding Hall	2	40 days	Rs. 3,00,000	9%
Restaurant	1	All days	Rs. 27,000 sales per day	8%

For the sake of simplicity in calculation, growth rate to be applied only once after completion of 10 years.

The estimated cost of land will be Rs. 250 million and the construction cost will be Rs. 100 million. The estimated salvage value at the end of 15th year will be 25% of the cost of construction. The cost of furniture will be of Rs. 1,50,000 for each normal room and Rs. 3,80,000 for each deluxe suite. The cost of the furniture for the conference room with wedding hall will be Rs. 7,00,000 each and for restaurant it will be 10,00,000. In addition, the hotel will require 4 elevators at different locations and will be costing around Rs. 35,00,000 each. The cost of buying and installing electronic appliances like TV sets, Air conditioners, Fridge etc. will be around Rs. 35 million. Elevators would be depreciated at a rate of 5% p.a. Electronic appliances will have a salvage value of 15% of its acquisition cost at the end of 15 years.

The hotel will be built by renowned builder named '**Harihar Infrastructure**'. The builder estimated that building will survive for 15 years. The required furniture will be supplied by the local reputed furniture company named **Veru Furnishings Ltd.** They ensured that furniture will go for 10 years very smoothly. At the end of tenth year, new furniture for normal rooms and deluxe suites will be bought and old

furniture for the same will be sold by the hotel owner. The owner of the hotel estimates that he would be able to purchase the required furniture at 15% higher price than the previous purchase price. The salvage value of the furniture at the end of tenth year will be 5% of their purchase prices with no book value remaining. Furniture at restaurant, conference and wedding hall will not require any major changes as such except for minor renovation which will cost Rs. 20,00,000 in total at the end of 12th year. Any scrap generated on account of such renovation will be sold at Rs. 1,75,000.

In order to boost the tourism industry at Goa, the state govt will be granting subsidy of 15% on the initial capex incurred, it will be paid at the time of cost incurred and additional subsidy of 10% on annual revenue expenses for the first 3 years of operation, but will be credited directly in the bank account only at the end of 5th year and the same shall be non-taxable.

The total annual recurring expenses will be Rs. 1,80,00,000/-. It includes salaries to managers, staff and employees, utilities expenses, house keeping and security services' contract, AMC for electronic appliances, restaurant supplies and materials, other miscellaneous expenses, etc.

After the end of 10 years, annual recurring expenses will increase at a rate of 10% which is to be applied once. Furthermore, the hotel authority is determined to provide the best and professional hotel services to the clients by offering training to the employees. They decided to spend Rs. 5,00,000 per year for the purpose of training of the employees.

The hotel project will be entitled to enjoy tax holiday for the first five years after which the corporate tax rate of 25% will also be applied for the hotel. The Cost of equity for the company is 12% and the estimated hurdle rate by considering the structure of capital of the proposed hotel is fixed at 15%.

(Depreciation to be taken on SLM basis and assume 360 days in a year. Ignore depreciation on furniture used in restaurant, conference and wedding hall)

Based on above, please answer to the following MCQs.

- (i) The amount of net initial investment required is:
 - (a) Rs. 41.044 Crores
 - (b) Rs. 34.887 Crores**
 - (c) Rs. 6.156 Crores
 - (d) Rs. 40.74 Crores
- (ii) NPV of the project is:
 - (a) Rs. 7.0532 Cr**
 - (b) Rs. 8.4029 Cr
 - (c) Rs. 8.4935 Cr
 - (d) Rs. 2.4700 Cr
- (iii) Pay Back period of the project to recover the initial investment is:
 - (a) 5.12 years
 - (b) 12.02 years
 - (c) 11.80 years
 - (d) 4.46 years**
- (iv) Estimated Recurring accounting profit/(loss) for first three years are:
 - (a) Rs. 7.0928 Cr p.a**

- (b) Rs. 6.9078 Cr p.a
 (c) Rs. 6.9937 Cr p.a
 (d) Rs. 9.6120 Cr p.a
- (v) IRR of the project is:
- (a) 16.25%
 (b) **19.39%**
 (c) 15%
 (d) 12%

Solution

(i) (b) ₹ 34.887 Crores

Amount Initial Investment required:

(A) Cost of Land & Construction Cost = 250 + 100 = 350 million i.e 35,00,00,000

(B) Furniture Cost

Normal Rooms = 40 x 1,50,000 = 60,00,000

Suite rooms = 8 x 3,80,000 = 30,40,000

Conference and wedding halls = 2 x 7,00,000

= 14,00,000

Restaurant = 10,00,000

(C) Elevators = 4 x 35,00,000 = 1,40,00,000

(D) Electronic Appliances = 3,50,00,000

Gross Investment Required = ₹ 41,04,40,000

Less: 15% Govt Subsidy on Capex = ₹ (6,15,66,000)

Net Initial Investment to be incurred by Hotel
 = ₹ 34,88,74,000

(ii) (a) ₹ 7.0532 Cr

PV of Cash Inflow = ₹ 42.2317 Cr

As per WN - 2

(-) PV of Cash Outflow = ₹ 35.1785 Cr

As per WN - 1

NPV = 7.0532 CR

Note: Discounting Rate would be the hurdle rate and not cost of equity as hurdle rate means the overall cost of capital

WN 1 - Calculation of PV of Cash Outflows

		(₹)	DF @ 15%	PV (₹)
Year 1	Initial Net Investment	4,88,74,000	1.0000	34,88,74,000
At the end of 10th Year				
Year 10	Purchase of new furniture (At 15% higher price)			
	Normal Rooms	69,00,000	0.2472	17,05,680
	Suite Rooms	34,96,000	0.2472	8,64,211
At the end of 12th Year				
Year 12	Renovation at restaurant, conference and wedding halls (Net)	18,25,000	0.1869	3,41,093
				35,17,84,983

WN – 2: Calculation of PV of Cash Inflows

	Year 1 to 5 (₹)	Year 6 to 10 (₹)	Year 11 to 15 (₹)
Sales			(Apply growth rate here)
Normal Rooms	3,84,00,000	3,84,00,000	4,30,08,000
Suites	2,40,00,000	2,40,00,000	2,61,60,000
Conf & Hall	2,40,00,000	2,40,00,000	2,61,60,000
Restaurant	97,20,000	97,20,000	1,04,97,600
Total Sales (A)	9,61,20,000	9,61,20,000	10,58,25,600
Less:			
Annual Recurring Exp (Excl Depreciation)	1,80,00,000	1,80,00,000	1,98,00,000

Training Exp	5,00,000	5,00,000	5,00,000
Depreciation			
Building	50,00,000	50,00,000	50,00,000
Elevators	7,00,000	7,00,000	7,00,000
Electronic App	19,83,333	19,83,333	19,83,333
Furniture (Old)	8,58,800	8,58,800	
Furniture (New)			10,39,600
TOTAL EXP (B)	2,70,42,133	2,70,42,133	2,90,22,933

TOTAL EXP (B)	2,70,42,133	2,70,42,133	2,90,22,933
NPBT (A - B)	6,90,77,867	6,90,77,867	7,68,02,667
(-) Tax	Nil (Tax Holiday)	1,72,69,466	1,92,00,666
NPAT	6,90,77,867	5,18,08,400	5,76,02,000
(+) Depreciation	85,42,133	85,42,133	87,22,933
(+) Cash Inflows from Operation	7,76,20,000	6,03,50,533	6,63,24,933
PVAF@ 15%	3.3522	1.6666	0.8285
PV of Cash Inflows from Operations	26,01,97,764	10,05,80,199	5,49,50,207

(+) PV of Other Cash Inflows

In year 5 - Govt Subsidy on first 3 years of = $55,50,000 \times 0.4972$
= ₹ 27,59,460

Annual Revenue Exp

In year 10 - Salvage Value of Old Furniture = $4,52,000 \times 0.2472$
= ₹ 1,11,734

In year 15 - Salvage of building and electronic appliance = $3,02,50,000 \times 0.1229$
= ₹ 37,17,725

Therefore, **Total PV of Cash Inflows** = ₹ 42,23,17,089

(iii) (d) 4.46 years

Total Net Initial Investment Incurred = ₹ 34,88,74,000

Cumulative of Total Cash Inflows (not discounted cash inflows)

Year	Total Cash Inflows (₹)	Cumulative of Cash Inflows (₹)
1.	7,76,20,000	7,76,20,000
2.	7,76,20,000	15,52,40,000
3.	7,76,20,000	23,28,60,000
4.	7,76,20,000	31,04,80,000
5.	8,31,70,000 (Govt Subsidy of 55,50,000 added here)	39,36,50,000
6.	6,03,50,533	45,40,00,533

From the above table, it can be seen that the initial net investment incurred is getting recovered after 4th year but before the end of 5th year i.e. somewhere between 4th & 5th Year.

$$\text{Payback period} = 4 + \frac{3,83,94,000}{8,31,70,000}$$

$$= 4 + 0.46 = 4.46 \text{ years}$$

(iv) (a) ₹ 7.0928 Cr p.a.

$$\begin{aligned} \text{Accounting profit} &= \text{NPAT} + \text{Govt Subsidy on Revenue Expense} \\ &= 6,90,77,867 + (1,85,00,000 \times 10\%) \\ &= 6,90,77,867 + 18,50,000 \\ &= 7,09,27,867 \text{ per annum} \end{aligned}$$



(v) (b) 19.39%

DF @ 15% NPV = ₹ 7.0532 Cr

DF @ 20% NPV = 34,10,68,926.17 - 35,07,57,719.00
= (₹ 0.9688 Cr)

$$\text{IRR} = \text{Lower Rate \%} + \frac{\{ \text{NPV @ Lower rate \%} \times (\text{Higher Rate \%} - \text{Lower Rate \%}) \}}{\text{NPV @ Lower rate \%} - \text{NPV @ Higher Rate \%}}$$

$$\text{IRR} = 15 + (7.0532 * 5 / 8.0220)$$

$$= 15 + 4.396$$

$$= 19.396\%$$

Question 2:

A project requires an initial investment of Rs. 20,000 and it would give annual cash inflow of Rs. 4,000. The useful life of the project is estimated to be 10 years. What is payback reciprocal/Approximated IRR?

- (a) 20%
- (b) 15%
- (c) 25%
- (d) 12%

Solution

$$\text{Payback Reciprocal} = \frac{\text{Average annual cash in flow}}{\text{Initial investment}}$$

$$= \frac{₹ 4,000 \times 100}{₹ 20,000} = 20\%$$

Question 3:

Management is considering a Rs. 1,00,000 investment in a project with a 5 year life and no residual value. If the total income from the project is expected to be Rs. 60,000 and recognition is given to the effect of straight line depreciation on the investment, the average rate of return is:

- (a) 12%
- (b) 24%
- (c) 60%
- (d) 75%

Solution

Question 4:

Assume cash outflow equals Rs. 1,20,000 followed by cash inflows of Rs. 25,000 peryear for 8 years and a cost of capital of 11%. What is the Net present value?

- (a) (Rs. 38,214)
- (b) Rs. 9,653
- (c) **Rs. 8,653**
- (d) Rs. 38,214

Solution**Question 5:**

What is the Internal rate of return for a project having cash flows of Rs. 40,000per year for 10 years and a cost of Rs. 2,26,009?

- (a) 8%
- (b) 9%
- (c) 10%
- (d) **12%**

Solution**Question 6:**

XYZ Ltd.is a company involved in manufacturing of toys and it is presently all equity financed. The directors of the company have been evaluating investment in a project which will require 400 lakhs capital expenditure on new machinery. They expect the capital investment to provide annual cash flows of 60 lakhs indefinitely which is net of all tax adjustments. The discount rate which it applies to such investment decisions is 12% net.

The directors of the company believe that the current capital structure fails to take advantage of tax benefits of debt and propose to finance the new project with undated perpetual debt secured on the company's assets. The company intends to issue sufficient debt to cover the cost of capital expenditure and the after tax cost of issue.

The current annual gross rate of interest required by the market on corporate undated debt of similar risk is 9%. The after tax costs of issue are expected to be 5% of the investment amount required. Company's tax rate is 30%.

Based on above information, answer the following:

(i) What is the value of tax relief on interest payment in perpetuity

- (a) Rs. 12.6 Lakhs
- (b) Rs 126 Lakhs
- (c) Rs. 10 Lakhs
- (d) Rs. 100 Lakhs

(ii) What is the adjusted present value of the investment

- (a) Rs. 126 Lakhs
- (b) Rs. 208 Lakhs
- (c) Rs. 206 Lakhs
- (d) Rs. 104 Lakhs

(iii) Annual income required to make NPV 0

- (a) Rs. 25.68 Lakhs
- (b) Rs. 24.64 Lakhs
- (c) Rs. 28.64 Lakhs
- (d) Rs. 22.52 Lakhs

(iv) What is the adjusted discount rate?

- (a) 8.80%
- (b) 7.65%
- (c) 6.32%
- (d) 6.11%

(v) Circumstances in which ADR may be used to evaluate future investments.

- a) Business risk of the new venture is identical to the one being evaluated.
- b) The project is to be financed by the same method.
- c) The project is to be financed by the same method on the same terms.
- d) Can be used in any situation.

Select the correct option

- a) (i) only
- b) (i) and (ii) only

c) (i) and (iii) only

d) All

Solution

1. tax relief on interest payment in perpetuity

Issue costs = Rs.400 lakhs x 5% = Rs.20 lakhs

Thus, the amount to be raised = Rs.400 lakhs + Rs.20 lakhs
= Rs.420 lakhs

Annual tax relief on interest payment = Rs.420 X 0.1 X 0.3
= Rs.12.6 lakhs in perpetuity

The value of tax relief in perpetuity = Rs.12.6 lakhs / 0.1
= Rs.126 lakhs

1. Calculation of Adjusted Present Value of Investment (APV)

Adjusted PV = Base Case PV + PV of financing decisions associated with the project

Base Case NPV for the project:

(Rs.60 lakhs / 0.12) - Rs.400 lakhs = Rs.500 lakhs - Rs.400 lakhs
= Rs.100 lakhs

Therefore, APV = Base case PV – Issue Costs + PV of Tax Relief on debt interest
= Rs.100 lakhs – Rs.20 lakhs + 126 lakhs = Rs.206 lakhs

1. Annual Income / Savings required to allow an NPV to zero

Let the annual income be x.

Rs.420 lakhs - (Annual Income / 0.12) = `206 lakhs

Annual Income / 0.12 = Rs.420 lakhs - Rs.206

Therefore, Annual income = Rs.214 X 0.12 = Rs.25.68 lakhs

1. Calculation of Adjusted Discount Rate (ADR)

Adjusted discount rate = (Rs.25.68 lakhs / Rs.420 lakhs) X 100
= 6.11%

1. Useable circumstances

This ADR may be used to evaluate future investments only if the business risk of the new venture is identical to the one being evaluated here and the project is to be financed by the same method on the same terms.

Question 7:

A Ltd. is evaluating a project involving an outlay of Rs. 10,00,000 resulting in an annual cash inflow of Rs.

2,50,000 for 6 years. Assuming salvage value of the property is zero.

- a) 12.98%
- b) 12.21%
- c) 14.98%
- d) 10.65%

Solution

First of all, we shall find an approximation of the payback period

$$= \frac{10,00,000}{2,50,000} = 4$$

Now, we shall search this figure in the PVAF table corresponding to 6-year row.

The value 4 lies between values 4.111 and 3.998, correspondingly discounting rates are 12% and 13% respectively.

NPV @ 12% and 13% is:

$$\text{NPV}_{12\%} = (10,00,000) + 4.111 \times 2,50,000 = +27,750$$

$$\text{NPV}_{13\%} = (10,00,000) + 3.998 \times 2,50,000 = -500$$

The internal rate of return is, thus, more than 12% but less than 13%. The exact rate can be obtained by interpolation:

$$\text{IRR} =$$

$$\text{IRR} = 12.978\% \text{ or } 12.98\%$$

Question 8:

ANP Ltd. is providing the following information

Annual cost of saving – Rs. 48,000

Useful life – 5 years

Salvage value zero

Internal rate of return – 15%

Profitability index – 1.05

What is the project initial investment

- (a) 1,60,900
- (b) 1,60,896
- (c) 1,60,494
- (d) 1,60,499

Solution

Annual cost saving = Cash inflow = 48,000

Useful life = 5 years

IRR = 15%

At 15% IRR, total present value of cash inflow is equal to initial cash outlay.

Total present value of cash inflow @ 15% for 5 years is 3.353

= 48,000 × 3.352 = 1,60,896.

Thus, Project cost = 1,60,896

Question 9:

A project whose useful life is 4 years has IRR of 15% and will save cost of ₹ 1,60,000 annually. What is the project cost i.e. initial investment?

- (a) 10,66,667
- (b) 4,60,000
- (c) 5,32,800
- (d) 4,56,800

Solution

Annual cost saving = Cash inflow = 1,60,000

Useful life = 4 years

IRR = 15%

At 15% IRR, total present value of cash inflow is equal to initial cash outlay.

Total present value of cash inflow @ 15% for 4 years is 2.855 = 1,60,000 × 2.855

= 4,56,800

Thus, Project cost = 4,56,800.

Question 10:

Bhaskar Ltd. estimated that a proposed project's 8-year net cash benefit will be 4,000 per year for years 1 to 8, with an additional terminal benefit of 8,000 at the end of the eighth year. Assuming that these cash inflows satisfy exactly the required rate of return of 8 percent, the project's initial cash outflow is closest to which of the following four possible answers?

- (a) 27,308
- (b) 25,149
- (c) 14,851
- (d) 40,000

Solution

Description: Years CAFT PV Factor 8% Present Value 1 to 8 4000 5.747 22988 2 25000 0.54 4320 Total PV 27308 (-) Initial Invt. -27308

NPV (Given) 0 hence, A) 25149

Question 11:

With initial investment of ₹ 100,000 and yearly cash inflows of 27,000 for 5 years, the NPV of the project with cost of capital of 10% shall be approximately

- (a) 35,000
- (b) -2,357
- (c) 2,357
- (d) -35,000

Solution

Description: The present value annuity factor @ 10% for 5 years is 3.791. Hence, NPV = 27,000 X 3.791 – 100,000 = 2,357 /-

Chapter no :

6

Ratio Analysis

QUESTION 1:

KT Ltd.'s opening stock was Rs. 2,50,000 and the closing stock was Rs. 3,75,000. Sales during the year were Rs. 13,00,000 and the gross profit ratio was 25% on sales. Average accounts payable are Rs. 80,000. Creditors Turnover Ratio =?

- (a) 13.33
- (b) 14.33
- (c) 14.44
- (d) 13.75

Solution**(d) 13.75**

Creditors Turnover Ratio = Purchases / Average Accounts Payable

Cost of Goods Sold = Opening Stock + Purchases - Closing Stock

Purchases = Cost of Goods Sold + Closing Stock - Opening Stock

Purchases = ₹ 9,75,000 + ₹ 3,75,000 - ₹ 2,50,000

Purchases = ₹ 11,00,000

Average Accounts Payable = ₹ 80,000

Creditors Turnover Ratio = Purchases / Average Accounts Payable

Creditors Turnover Ratio = ₹ 11,00,000 / ₹ 80,000

Creditors Turnover Ratio = 13.75

Therefore, the Creditors Turnover Ratio is 13.75.

Question 2:

Assuming $K_e = 11\%$, $K_d = 8\%$ and $K_o = 10\%$, Debt Equity ratio of the company

- (a) 2:3
- (b) 3:2
- (c) 1:2
- (d) 2:1

Solution

(c) 1:2

Item	Cost	Weight	Product
Debt	8%	W	8W
Equity	11%	1 - W	11 - 11W
			WACC = 10

$W_d = 1/3$ and $W_e = 2/3$ Debt Equity Ratio = 1/2

Question 3:

Total Assets & Current liabilities of the Vitrag Limited are 50 lakhs & 10 lakhs respectively. ROCE is 15%, measure of business operating risk is at 3.5 & P/V ratio is 70%. Calculate Sales.

- (a) 21 lakhs
- (b) 30 lakhs
- (c) 37.50 lakhs
- (d) 40 lakhs

Solution

(b) $ROCE = EBIT / \text{Total Capital Employed}$

Total Capital Employed = Total Assets – Current Liabilities

= 50 lakhs – 10 lakhs

= 40 lakhs

EBIT = 40 lakhs x 15%

= 6 lakhs

Now, OL of 3.5 = Contribution / EBIT

Therefore Contribution = 6 Lakhs X 3.5 = 21 lakhs

Sales = Contribution / PV Ratio = 21 lakhs / 0.7 = 30 lakhs

Question 4:

From the following information, calculate P/E ratio:

Equity share capital of Rs. 10 each	Rs. 8,00,000
9% Preference share capital of Rs. 10 each	Rs. 3,00,000
Profit (after 35% tax)	Rs. 2,67,000
Depreciation	Rs. 67,000
Market price of equity share	Rs. 48

- (a) 15 times
- (b) **16 times**
- (c) 17 times
- (d) 18 times

Solution

Question 5:

A company has average accounts receivable of Rs. 10,00,000 and annual credit sales of Rs. 60,00,000. Its average collection period would be:

- (a) **60.83 days**
- (b) 6.00 days
- (c) 1.67 days
- (d) 0.67 days

Solution

Question 6:

A company has net profit margin of 5%, total assets of Rs. 90,00,000 and return on assets of 9%. Its total asset turnover ratio would be:

- (a) 1.6
- (b) 1.7
- (c) **1.8**
- (d) 1.9

Solution**Question 7:**

Calculate operating expenses from the information given below:

Sales	Rs. 75,00,000
Rate of income tax	50%
Net profit to sales	5%
Cost of goods sold	Rs. 32,90,000
Interest on debentures	Rs. 60,000

- (a) Rs. 41,00,000
- (b) Rs. 8,10,000
- (c) **Rs. 34,00,000**
- (d) Rs. 33,90,000

Solution**Question 8:**

RNOC Ltd is a listed company and has been facing a cash crunch situation since a while. The CFO is of the opinion that excess stock maintained as per the instructions of management of the company is the reason for cash crunch. However, the management states that its product line requires larger amount of inventory due to greater variety of product line and customer may ask for any type of product. To maintain competitive advantage, the company should be able to cater to customer needs as and when required. The management is highly critical of the collection team as the management feels that they are not collecting the receivables



within time as per industry standards.

You have been hired by the company as a financial consultant. Management has provided you the latest audited financial statements and also relevant industry statistics. You are required to advise the company to improve its liquidity position.

Statement of Profit and Loss	Rs.	Rs.
Sales		1,25,00,000
Cost of Goods Sold		
Opening Stock	23,00,000	
Add: Purchases	80,00,000	
Add: Direct Expenses	12,00,000	
Less: Closing Stock	(38,60,000)	(76,40,000)
Gross Profit		48,60,000
Less: Operating expenses		
Administrative expenses	13,20,000	
S&D Expenses	15,90,000	(29,10,000)
Operating profit		19,50,000
Add: Non-operating income		3,28,000
Less: Non-operating expenses		(1,27,000)
Profit before interest and taxes		21,51,000
Less: Interest		(4,39,000)
Profit before tax		17,12,000
Less: Taxes		(4,28,000)
Profit after tax		12,84,000

Sources of funds		Rs.	Rs.
Owned Fund			
	Equity Share Capital	30,00,000	
	R&S	18,00,000	48,00,000
Borrowed Funds			
	Secured Loan	10,00,000	
	Unsecured Loan	4,30,000	14,30,000
Total fund raised			62,30,000
Application of funds			
Non-current assets	Building	7,50,000	
	Machinery	2,30,000	

	Furniture	7,60,000	
	Intangible assets	50,000	17,90,000
Current assets	Inventory	38,60,000	
	Receivables	39,97,000	
	ST Investment	3,00,000	
	Cash and Bank	2,30,000	83,87,000
Less: Current Liabilities	Creditors	25,67,000	
	ST Loan	13,80,000	(39,47,000)
Total Funds employed			62,30,000

Industry Standards

Receivables Turnover = 90 Days

Inventory Turnover = 100 Days

Payables turnover = 90 Days

Net Asset Turnover = 4 Times

The company has set certain standards for the upcoming year financial status.

All the ratios are based on closing figures in financial statements.

Equity SC to Reserves = 1

Net Profit Ratio = 15%

Gross Profit Ratio = 50%

loan Term Debt to Equity = 0.5

Debtor Turnover 100 Days

Creditor Turnover (based on COGS) = 100 Days

Inventory = 70% of Opening inventory

Cash Balance is assumed to remain same for next year.

- i) What is the inventory turnover ratio in days and whether assertion of CFO is correct?
 - a) 120 days, correct
 - b) 100 days, incorrect
 - c) 185 days, correct
 - d) 150 days, incorrect



- ii) What is the receivables turnover and whether management assertion is correct
- a) 117 days and correct
 - b) 100 days and correct
 - c) 85 days and correct
 - d) 85 days and incorrect
- iii) What is the expense company needs to incur for earning Rs. 1 revenue in the last year
- a) 0.844
 - b) 0.754
 - c) 0.962
 - d) 0.824
- iv) What is the projected net working capital of the company
- a) 42,87,891
 - b) 40,27,891
 - c) 48,27,891
 - d) 48,28,891
- v) What is the projected long-term debt of the company for the next year
- a) 60,00,000
 - b) 30,00,000
 - c) 14,30,000
 - d) 28,60,000

Solution

$$\text{Inventory Turnover} = \frac{\text{Inventory}}{\text{COGS}} \times 365$$

$$\frac{\text{Inventory}}{\text{COGS}} \times 365$$

$$= \frac{38,60,000 \times 365}{76,40,000}$$

$$\frac{38,60,000 \times 365}{76,40,000}$$

$$= 184.41 \text{ days} = 185 \text{ days (apx)}$$

Inventory holding period of 185 days is significantly higher as compared to industry standard of 100 days. This means a significant amount of working capital is tied in inventory, which may be leading to liquidity crunch.

Receivables Turnover= $\frac{\text{Receivables}}{\text{Sales}} \times 365$

$$\frac{\text{Receivables}}{\text{Sales}} \times 365$$

$$= \frac{39,97,000}{1,25,00,000} \times 365$$

$$\frac{39,97,000 \times 365}{1,25,00,000}$$

$$= 116.71 = 117 \text{ days (apx)}$$

Receivables turnover of 117 days as compared to industry standard of 90 days is a further delay of 27 days. This will lead to good amount of money being tied up in debtors.

Description:

Operating Ratio is the number which indicates cost incurred by company for earning each rupee of revenue

Operating Ratio= $\frac{\text{COGS} + \text{Operating Expenses}}{\text{Sales}} \times 100$

$$\frac{\text{COGS} + \text{Operating Expenses}}{\text{Sales}} \times 100$$

$$= \frac{76,40,000 + 29,10,000}{1,25,00,000} \times 100$$

$$\frac{76,40,000 + 29,10,000}{1,25,00,000} \times 100$$

$$= 0.844$$

Equity to Reserves= 1

Reserves= $1 \times 30,00,000 = 30,00,000$

Projected profit= $30,00,000 - 18,00,000 = 12,00,000$

Net Profit Margin= 15%

$12,00,000 / \text{Sales} = 0.15$

Sales= $80,00,000$

Gross Profit= $80,00,000 \times 50\% = 40,00,000$

COGS= $80,00,000 - 40,00,000 = 40,00,000$

Projected Debtors Turnover= 100 days= closing Receivables/Sales x 365

$$100 = \frac{\text{Closing Receivables}}{80,00,000} \times 365$$

$$\text{Closing Receivables} = 80,00,000 \times 100 / 365 = 21,91,781$$

Projected Closing Inventory= 70% of opening inventory= $70\% \text{ of } 38,60,000 = 27,02,000$

Projected Creditor Turnover= 100 days= closing creditors/COGSx365

Closing Creditors= $\text{COGS} \times 100 / 365$

Closing Creditor= $40,00,000 \times 100 / 365 = 10,95,890$

Net Working Capital= Cash+Debtors+Inventory-creditors= $2,30,000 + 21,91,781 + 27,02,000 - 10,95,890$

Net Working Capital= $40,27,891$

$$\text{Equity Share Capital} + \text{Reserves} = 30,00,000 + 30,00,000 = 60,00,000$$

$$\text{Long Term Debt to Equity} = 0.5$$

$$\text{LTD} / 60,00,000 = 0.5$$

$$\text{Long Term Debt} = 0.5 \times 60,00,000$$

$$\text{Long Term Debt} = 30,00,000$$

Question 9:

If working capital of company is Rs. 1,35,000, Current Ratio – 2.5, Liquid Ratio-1.5, reserves and surplus = Rs. 90,000 then what are the quick assets of the company

- (a) 90,000
- (b) 1,35,000
- (c) 1,45,000
- (d) 60,000

Solution

1. Let Current Liability = X,

Current Assets = 2.5x,

2. Working Capital = Current Assets - Current Liabilities = 135000 = 2.5x - x

or 135000 = 1.5x

or x = 90000 (Current Liability)

hence, 2.5x = 2.5 * 90000 = 225000 (Current Assets)

3. Quick Ratio = Quick Assets / Current Liabilities

Or 1.5 = Quick Assets / 90000

Or Q.A. = 135000

Question 10:

Current ratio is 2.5:1 and liquid ratio is 1.5:1. If inventory is Rs. 9,60,000, then the amount of current assets will be

- (a) 9.6 lakhs
- (b) 14.40 Lakhs

- (c) 24 Lakhs
(d) 38.40 Lakhs

Solution

CurrentRatio=CurrentAssets/CurrentLiab.

2.5=X/Y

2.5y=x

LiquidRatio=CurrentAssets-Stock/CurrentLiab.

1.5=2.5y-960000/y

1.5y=2.5y-9,60,000

y=9,60,000

x = 9,60,000 × 2.5 = 24,00,000

Question 11:

If Gross profit = 54,000, GP Ratio =20%, Average collection period is 18 days (360 days year), then find out the average debtors considering that credit sales are 80% of total assets

- (a) 13,500
(b) 10,800
(c) 12,000
(d) 14,000

Solution

1. Sales = GP/20%=54000/20%=270000 2. Credit Sales=80% of 270000=216000 3. Average Collection Period=Avg. Debtors/Net Credit Sales*360 Or 18=Avg. Debtors/216000*360 or Avg. Debtors=10800.

Question 11:

Total Sales = 30,00,000, cash sales 25% of credit sales, Debtors turnover is 8 times then what are the average debtors?

- (a) 24,00,000
(b) 3,00,000
(c) 6,00,000
(d) 9,00,000

Solution

Description: 1. Let Credit Sales= X 2.Cash Sales= .025x 3.Total Sales= Credit Sales + Cash Sales = 3000000=X + .25x = 3000000= 1.25x = X = 2400000(Credit Sales) hence, 0.25x=0.25*2400000=600000(Cash Sales), 4.Debtors T/O Ratio= Net Credit Sales/Avg. Debtors =8=2400000/Avg. debtors hence, Avg. Debtors=300000

Question 12:

Gross Profit = Rs. 60,000, GP Ratio = 20%, Stock velocity = 6 times then find out what is the average

stock?

- (a) 40,000
- (b) 3,00,000
- (c) 2,40,000
- (d) 37,500

Solution

1. Sales=GP/20%=60000/20%=300000

2. COGS=Sales-GP=300000-60000=240000

3. Stock velocity/Stock turnover ratio=COGS/Avg. Stock

6=240000/Avg. Stock

Avg. Stock=40000

Management of Working Capital

Question 1:

ArMore LLP is a newly established startup dealing in manufacture of a revolutionary product HDHMR which is a substitute to conventional wood and plywood. It is an economical substitute for manufacture of furniture and home furnishing. It has been asked by a venture capitalist for an estimated amount of funds required for setting up plant and also the amount of circulating capital required. A consultant hired by the entity has advised that the cost of setting up the plant would be Rs. 5 Crores and it will require 1 year to make the plant operational. The anticipated revenue and associated cost numbers are as follows:

Units to be sold = 3 lakh sq metres p.a.

Sale Price of each sq mtr = Rs. 1000

Raw Material cost = Rs. 200 per sq mtr Labour cost = Rs. 50 per hour

Labour hours per sq mtr = 3 hours

Cash Manufacturing Overheads = Rs. 75 per machine hour

Machine hours per sq mtr = 2 hours

Selling and credit administration Overheads = Rs. 250 per sq mtr

Being a new product in the industry, the firm will have to give a longer credit period of 3 months to its customers. It will maintain a stock of raw material equal to 15% of annual consumption. Based on negotiation with the creditors, the payment period has been agreed to be 1 month from the date of purchase. The entity will hold finished goods equal to 2 months of units to be sold. All other expenses are to be paid one month in arrears. Cash and Bank balance to the tune of Rs. 25,00,000 is required to be maintained.

The entity is also considering reducing the working capital requirement by either of the two options:

- reducing the credit period to customers by a month which will lead to reduction in sales by 5%.
- Engaging with a factor for managing the receivables, who will charge a commission of 2% of invoice value and will also advance 65% of receivables @ 12% p.a. This will lead to savings in administration and bad debts cost to the extent of Rs. 20 lakhs and 16 lakhs respectively.

The entity is also considering funding a part of working capital by bank loan. For this purpose, bank has stipulated that it will grant 75% of net current assets as advance against working capital. The bank has quoted 16.5% rate of interest with a condition of opening a current account with it, which will require 10% of loan amount to be minimum average balance.

You being an finance manager, has been asked the following questions:

- The anticipated profit before tax per annum after the plant is operational is
 - 750 Lakhs
 - 570 Lakhs
 - 370 Lakhs
 - 525 Lakhs

- (ii) The estimated current assets requirement in the first year of operation (debtors calculated at cost) is
- (A) 9,42,50,000
 - (B) 2,17,08,333
 - (C) 7,25,41,667
 - (D) 67,08,333
- (iii) The net working capital requirement for the first year of operation is
- (A) 9,42,50,000
 - (B) 2,17,08,333
 - (C) 7,25,41,667
 - (D) 67,08,333
- (iv) The annualised % cost of two options for reducing the working capital is
- (A) 18.18% and 16.92%
 - (B) 18.33% and 16.92%
 - (C) 18.59% and 18.33%
 - (D) 16.92% and 19.05%
- (v) What will be the Maximum Permissible Bank Finance by the bank and annualised % cost of the same?
- (A) 4,55,03,630 and 18.33%
 - (B) 5,44,06,250 and 18.33%
 - (C) 4,45,86,025 and 18.59%
 - (D) 3,45,89,020 and 19.85%

Solution



(i) (A) 750 Lakhs

	Units	Per unit (₹)	Amount (₹)
Raw Material consumption	3,50,000	200	7,00,00,000
labour cost	3,50,000	150	5,25,00,000
Production Overheads	3,50,000	150	5,25,00,000
Cost of Production	3,50,000	500	17,50,00,000
Less: Stock of FG	50,000	500	2,50,00,000
COGS	3,00,000	500	15,00,00,000
Selling and admin exp	3,00,000	250	7,50,00,000
Cost of Sales	3,00,000	750	22,50,00,000
Sales	3,00,000	1000	30,00,00,000
Profit	3,00,000	250	7,50,00,000

Stock of FG (sq. mtr.) = $30,00,000 \times 2/12 = 50,000$

Units sold = 3,00,000

Raw material consumed (sq. mtr.) = 3,50,000

Raw Material Purchases = Consumption + RM stock (15%)
 = 7,00,00,000 + 1,05,00,000
 = ₹ 8,05,00,000

(ii) (A) **9,42,50,000**

Stock of Raw Material (15% of 7,00,00,000) = 1,05,00,000

Stock of finished goods = 2,50,00,000



Debtors (22,50,00,000 x 3/12)	= 5,62,50,000
Cash	= 25,00,000
Total Current Assets	= 9,42,50,000

(iii) (C) 7,25,41,667

Working Capital Statement

	Amount (₹)
Stock of Raw Material (15% of 7,00,00,000)	1,05,00,000
Stock of finished goods	2,50,00,000
Debtors (22,50,00,000 x 3/12)	5,62,50,000
Cash	25,00,000
Total Current Assets	9,42,50,000
Creditors (8,05,00,000 x 1/12)	67,08,333
O/s Exp (18,00,00,000 x 1/12)	1,50,00,000
Total Current Liabilities	2,17,08,333
Net Working Capital	7,25,41,667

(iv) (A) 18.18% and 16.92%

Cost reducing debtors credit period

Debtors credit period	= 2 months
Debtors balance	= 21,37,50,000 (2,85,000 units) x 2/12 = ₹3,56,25,000

Debtors credit period	= 3 months
Debtors balance	= 22,50,00,000 x 3/12 = ₹ 5,62,50,000

Amount released from debtors = ₹ 2,06,25,000

reduction in profit (15,000 units x ₹ 250) = ₹ 37,50,000

% p.a. cost (37,50,000/2,06,25,000) = **18.18%****Costs of factoring**

Commission (2% of 30 crores) = ₹ 60,00,000

Interest = ₹ 58,50,000

(30cr x 65% x 12% x 3/12)

savings = ₹ 36,00,000

Net cost of factoring $\frac{82,50,000}{65\% \text{ of } 30\text{cr. i.e. } 19,50,00,000} \times \frac{12}{3}$

= ₹ 82,50,000

% p.a. cost = **16.92%**

(v) (B) 5,44,06,250 and 18.33%

Maximum Permissible Bank Finance = 75% of 7,25,41,667
= ₹ 5,44,06,250

Annualised cost of bank loan = 16.5/90% = 18.33%

Question 2:

NV Industries Ltd. is a manufacturing industry which manages its accounts receivables internally by its sales and credit department. It supplies small articles to different industries. The total sales ledger of the company stands at Rs. 200 lakhs of which 80% is credit sales. The company has a credit policy of 2/40, net 120. Past experience of the company has been that on average out of the total, 50% of customers avail of discount and the balance of the receivables are collected on average in 120 days. The finance controller estimated, bad debt losses are around 1% of credit sales.

With escalating cost associated with the in-house management of the debtors coupled with the need to unburden the management with the task so as to focus on sales promotion, the CFO is examining the possibility of outsourcing its factoring service for managing its receivables. Currently, the firm spends about Rs. 2,40,000 per annum to administer its credit sales. These are avoidable as a factoring firm is prepared to buy the firm's receivables. The main elements of the proposal are : (i) It will charge 2% commission (ii) It will pay advance against receivables to the firm at an interest rate of 18% after withholding 10% as reserve.

Also, company has option to take long term loan at 15% interest or may take bank finance for working capital at 14% interest.

You were also present at the meeting; being a financial consultant, the CFO has asked you to be ready with the following questions:

Consider year as 360 days.

1. What is average level of receivables of the company?
 - a. Rs. 53,33,333
 - b. Rs. 35,55,556
 - c. Rs. 44,44,444
 - d. Rs. 71,11,111
2. How much advance factor will pay against receivables?
 - a. Rs. 31,28,889
 - b. Rs. 39,11,111
 - c. Rs. 30,03,733
 - d. Rs. 46,93,333
3. What is the annual cost of factoring to the company?
 - a. Rs. 8,83,200
 - b. Rs. 4,26,667
 - c. Rs. 5,51,823
 - d. Rs. 4,00,000
4. What is the net cost to the company on taking factoring service?
 - a. Rs. 4,00,000
 - b. Rs. 4,26,667

c. Rs. 3,50,000

d. Rs. 4,83,200

5. What is the effective cost of factoring on advance received?

a. 16.09%

b. 13.31%

c. 12.78%

d. 15.89%

Solution

I. (b) ₹ 35,55,556

II. (c) ₹ 30,03,733

III. (a) ₹ 8,83,200

IV. (d) ₹ 4,83,200

V. (a) 16.09%

Working Note

Particulars	(₹)
Total Sales	₹ 200 lakhs
Credit Sales (80%)	₹ 160 lakhs
Receivables for 40 days	₹ 80 lakhs
Receivables for 120 days	₹ 80 lakhs
Average collection period [(40 × 0.5) + (120 × 0.5)]	80 days
Average level of Receivables (₹ 1,60,00,000 × 80/360)	₹ 35,55,556
Factoring Commission (₹ 35,55,556 × 2/100)	₹ 71,111
Factoring Reserve (₹ 35,55,556 × 10/100)	₹ 3,55,556
Amount available for advance {₹ 35,55,556 - (3,55,556 + 71,111)}	₹ 31,28,889
Factor will deduct his interest @ 18%: Interest = $\frac{₹31,28,889 \times 18 \times 80}{100 \times 360}$	₹ 1,25,156
Advance to be paid (₹ 31,28,889 – ₹ 1,25,156)	₹ 30,03,733

(i) Statement Showing Evaluation of Factoring Proposal

	₹
A. Annual Cost of Factoring to the Company:	
Factoring commission (₹ 71,111 × 360/80)	3,20,000
Interest charges (₹ 1,25,156 × 360/80)	<u>5,63,200</u>
Total	<u>8,83,200</u>

B.	Company's Savings on taking Factoring Service:	₹
	Cost of credit administration saved	2,40,000
	Bad Debts (₹ 160,00,000 x 1/100) avoided	<u>1,60,000</u>
	Total	<u>4,00,000</u>
C.	Net Cost to the company (A – B) (₹ 8,83,200 – ₹ 4,00,000)	<u>4,83,200</u>

$$\text{Effective cost of factoring} = \frac{\text{₹ } 4,83,200}{\text{₹ } 30,03,733} \times 100 = 16.09\%$$