Formulas

Profitability ratios:

1. Profitability related to sales

1. Gross profit ratio $= \frac{Gross\ profit}{Net\ Sales}$ x 100

   Gross profit = Net sales – Cost of goods sold

   Cost of goods sold = Opening stock + Purchases _ Direct exp. – Closing stock

   Net Sales = Total sales – Sales return

2. Net profit ratio $= \frac{Net\ profit}{Net\ Sales}$ x 100

3. Operating Profit ratio $= \frac{Operating\ profit}{Net\ Sales}$ x 100

   Operating profit = Net profit + Non-operating expenses – Non operating incomes

4. Operating Profit ratio $= \frac{Cost\ of\ goods\ sold + Operating\ expenses}{Net\ Sales}$ x 100

2. Profitability related to Investments

1. Return on Investment (ROI) $= \frac{Operating\ profit}{Capital\ employed}$ x 100

   Capital employed = Equity share capital + Preference share capital + Undistributed profits+ Reserves and surplus+ Debentures and other long term loans- Fictitious assets.

   Capital employed = Fixed assets + Current assets – Current liabilities

2. Return on shareholders fund $= \frac{NP\ after\ Interest\ and\ tax}{Shareholders\ funds}$ x 100

   Share holders funds = Equity share capital + Preference share capital + Share premium + Revenue reserve + Capital reserve + Capital reserve + Retained earnings + Accumulated losses.

3. Return on equity $= \frac{NP\ after\ Interest\ and\ tax\ and\ Preference\ dividend}{Equity\ Shareholders\ funds}$ x 100

   Equity Share holder = Equity share capital + Reserves+ Profits – Accumulated losses

4. Return on total assets $= \frac{NP\ after\ Interest\ and\ tax}{Total\ Assets}$ x 100

5. Earning per share $= \frac{NP\ after\ Interest\ and\ tax\ and\ Preference\ dividend}{Number\ of\ Equity\ Shares}$ x 100

Prob 1

From the following information calculate Gross profit ratio, Net profit ratio and Operating ratio

Sales 5,00,000, Cost of goods sold 3,00,000, Operating expenses 1,00,000 and Non-operating expenses 20,000.

Solution

1. Gross profit ratio = $\frac{Gross\ profit}{Net\ Sales}$ x 100

Gross profit = Net sales – Cost of goods sold

= 5,00,000-3,00,000 = 2,00,000

Net Sales = 5,00,000

GPR = (2,00,000/5,00,000) *100 = 40%

2. Net profit ratio = $\frac{Net\ profit}{Net\ Sales}$ x 100

NP= GP – (Operating expenses + Non-operating expenses)

= 2,00,000 – (1,00,000+20,000) = 2,00,000-1,20,000 = 80,000

NPR = (80,000/5,00,000) * 100 = 16%

3. Operating Profit ratio = $\frac{Operating\ profit}{Net\ Sales}$ x 100

=(Cost of goods sold + Operating exp.) /Net sales *100

= (3,00,000 + 1,00,000)/5,00,000 *100 =(4,00,000/5,00,000)*100

= 80%

Prob 2

You are required to calculate return on capital employed or return on Investment from the following information:

Net profit after tax = 3,00,000, Rate of Income tax = 50%,

5000, 8% Convertible debentures Rs 100 each = 5,00,000

Current assets = 5,00,000, Current liabilities = 2,50,000,

Fixed assets = 10,25,000, Depreciation = 1,25,000.

Solution

Return on capital employed = (NP before Interest and tax / Capital employed) * 100

NP before tax = 3,00,000 *100/50 = 6,00,000

NP before interest = 5,00,000 *8/100 = 40,000

NP Before int and tax = NP before tax + NP before interest

= 6,00,000+ 40,000 = 6,40,000

Capital employed = Fixed assets + Working capital

= (Fixed assets – Depreciation) + (Current assets – Current liabilities)

= (10,25,000-1,25,000) + (5,00,000 - 2,50,000)

= 9,00,000 + 2,50,000 = 11,50,000

Return on capital employed = (6,40,000 / 11,50,000) * 100 = 56%

Prob 3

From the following information calculate return on equity

Particulars	Amt	Particulars	Amt
To office and Admin exp	2,20,000	By Gross profit b/d	8,00,000
To selling and distribution exp	1,50,000		
To Int on bank loan	10,000		
To NP	4,20,000		
	8,00,000		8,00,000

Additional info:

Provide 10% dividend on Rs.6,00,000, Equity capital dividend into 60,000 shares of Rs.10 each.

General reserve balance Rs.1,00,000

Preliminary exp. Rs.15,000

Solution:

Return on equity = $\frac{NP\ after\ Interest\ and\ tax\ and\ Preference\ dividend}{Equity\ Shareholders\ funds}$ x 100

NP after tax = 4,20,000*50/100 = 2,10,000

NP after dividend = 6,00,000*10/100 = 60,000

NP after Int. and tax and pref. dividend = 4,20,000 – 2,10,000 – 60,000.

= 1,50,000

Equity shareholders fund = Equity share capital + GR – Preliminary exp.

= 6,00,000 + 1,00,000 – 15,000

= 6,85,000

Return on equity = (1,50,000/ 6,85,000) * 100 = 21.89%

Prob 4

Calculate EPS from the following data

NP after tax 76,000, 12% preference share capital (Rs. 10 each) 3,00,000, Equity share capital (Rs. 10 each) 2,00,000.

$$\text{Earnings per share} = \frac{NP\ after\ Interest\ and\ tax\ and\ Preference\ dividend}{Number\ of\ Equity\ Shares} \times 100$$

NP after int. Tax and dividend = 76,000 – (3,00,000*12/100)

= 76,000 – 36,000 = 40,000

N. of equity shares = 2,00,000/10 = 20,000 shares

EPS = 40,000/20,000 = Rs.2

Activity/ Turnover ratio

Formulas

1. Capital turnover ratio = $\frac{Cost\ of\ goods\ sold\ or\ sales}{Capital\ employes}$
2. Fixed assets turnover ratio = $\frac{Cost\ of\ goods\ sold\ or\ sales}{Net\ Fixed\ assets}$
3. Working capital turnover ratio = $\frac{Cost\ of\ goods\ sold\ or\ sales}{Net\ working\ capital}$
4. Stock turnover ratio = $\frac{Opening\ stock+Closing\ stock}{2}$
5. Debtors turnover ratio = $\frac{Net\ credit\ sales}{Average\ accounts\ receivable}$
6. Creditors turnover ratio = $\frac{Net\ credit\ Purchase}{Average\ accounts\ payable}$

Prob 1

From the following information calculate Capital turnover ratio, Fixed assets turnover ratio and Working capital turnover ratio

Sales = 15,00,000, GP= 20% on sales, Current assets = 4,00,000, Current liabilities = 2,00,000

Fixed assets 5,00,000 – Depreciation 1,00,000 = 4,00,000

Solution

1. Capital turnover ratio = $\frac{Cost\ of\ goods\ sold\ or\ sales}{Capital\ employed}$

Cost of goods sold = Sales – GP = 15,00,000 – (15,00,000*20/100)

= 15,00,000 - 3,00,000 = 12,00,000

Capital employed = Net FA + Working Capital

= 4,00,000 + (CA – CL) = 4,00,000 + (4,00,000 – 2,00,000)

= 4,00,000+2,00,000 = 6,00,000

CTR = 12,00,000/6,00,000 = 2 times.

2. Fixed assets turnover ratio = $\frac{Cost\ of\ goods\ sold\ or\ sales}{Net\ Fixed\ assets}$

= 12,00,000/4,00,000 = 3 times.

3. Working capital turnover ratio = $\frac{Cost\ of\ goods\ sold\ or\ sales}{Net\ working\ capital}$

= 12,00,000/2,00,000 = 6 times.

Prob 2

From the following information calculate Stock turnover ratio. Opening stock = 29,000, Closing stock = 31,000, Sales = 3,00,000, GP = 20% on sales.

Solution

Stock turnover ratio = $\frac{Cost\ of\ Goods\ sold}{Average\ stock}$

Cost of Goods sold = Sales – GP = 3,00,000 – (3,00,000*20/100)

= 3,00,000 – 60,000 = 2,40,000

Average stock = $\frac{Opening\ stock+Closing\ stock}{2}$

= (29,000+31,000)/2 = 60,000/2 = 30,000

STR = 2,40,000/30,000 = 8 times.

Prob 3

From the following information calculate Debtors turnover ratio Total sales of the year Rs. 1,75,000, Cash sales 20% on total sales, Seles return out of credit sales Rs. 10,000. Sundry debtors: Opening balance Rs.8000, Closing balance Rs. 12,000.

Solution

Debtors turnover ratio = $\frac{Net\ credit\ sales}{Average\ accounts\ receivable}$

Credit sales = Total sales – Cash sales = 1,75,000 – (1,75,000*20/100)

= 1,75,000 – 35,000 = 1,40,000

Net credit sales = Credit sales – Sales returns = 1,40,000 – 10,000 = 1,30,000.

Average Debtors = (Opening balance + Closing balance) /2

= (8,000 + 12,000)/2 = 20,000/2 = 10,000

DTR = 1,30,000/10,000 = 13 times.

Prob 4

From the following information calculate Creditors turnover ratio

Total purchase Rs. 6,00,000, Cash purchase Rs. 2,50,000, Bills payable on 1.1.1999 Rs. 25,000, Bills payable on 31.1.1999 Rs. 75,000, Sundry creditors 0n 1.1.1999 Rs. 1,50,000, Sundry creditors 0n 31.1.1999 Rs. 1,00,000

Solution

Creditors turnover ratio = $\frac{Net\ credit\ Purchase}{Average\ accounts\ payable}$

Net Credit purchase = Total purchase – Cash purchase = 6,00,000 – 2,50,000 = 3,50,000

Average A/Cs pay able = Average Creditors + Average Bills payable

Average Crs = (Op. bal + Clo. Bal.)/2 = (1,50,000+1,00,000)/2 = 2,50,000/2 = 1,25,000

Avg. BP = (25,000+75,000)/2 = 1,00,000/2 = 50,000

Avg A.cs payable = 1,25,000+50,000 = 1,75,000

CTR = 3,50,000 / 1,75,000 = 2 times

Solvency Ratio

Short term Solvency ratio

1. Current ratio = $\frac{Current\ Assets}{Current\ liabilities}$

2. Liquid ratio = $\frac{Liquid\ Assets}{Current\ liabilities}$

3. Absolute liquid ratio or Quick ratio = $\frac{Cash\ and\ Bank\ balance + Marketable\ securities}{Current\ liabilities}$

Long term Solvency ratio

1. Debt equity ratio = = $\frac{Total\ long\ term\ debt}{Shareholders\ fund}$

Long term debt = Debentures+ Term loans+ Loan on mortgage+ Loans from financial institution+ Other long term loans+ Redeemable preference share capital.

Share holders fund = Equity share capital+ Irredeemable preference share capital+ Capital reserves+ Retained earnings+ Any marked surplus like provision for contingencies etc. – Fictitious asset.

2. Fixed assets ratio = $\frac{Net\ fixed\ Assets}{Long\ term\ funds}$

Net fixed assets = Fixed assets – Depreciation

Long term funds = Equity share capital+ preference share capital+ Capital reserves+ Resrves and surplus + Debentures+ other long term loans

3. Proprietary ratio = $\frac{Share\ holders\ fund}{Total\ tangible\ assets}$

Share holders fund = Equity share capital+ Irredeemable preference share capital+ Capital reserves+ Retained earnings+ Any marked surplus like provision for contingencies etc. – Fictitious asset.

Total tangible assets = Fixed assets + Current assets.

Prob 1

From the following particulars pertained to liabilities and asset.

Liabilities	Amount Rs.	Assets	Amount Rs.
Share capital	2,00,000	Fixed asset	1,60,000
Reserves & surplus	30,000	Stock	50,000
Creditors	20,000	Debtors	20,000
Bill payable	22,000	Bills receivable	15,000
Outstanding expenses	8,000	Prepaid expenses	5,000
Provision for tax	20,000	Cash at bank	30,000
		Cash in hand	20,000
	3,00,000		3,00,000

Calculate Current ratio, Quick ratio and also comment liquidity of the firm.

Solution :

Current ratio $= \frac{\text{Current assets}}{\text{Current liabilities}}$

Current assets = Stock + Debtors + Bill receivable + Prepaid Expenses + Cash at Bank + cash in hand

= 50,000+20,000+15,000+5,000+30,000+20,000

Current assets = 1,40,000

Current liabilities = Creditors + Bills payable + outstanding expenses + provision for Tax

= 20,000+22,000+8,000+20,000

Current liabilities = 70,000

Current ratio $= \frac{1,40,000}{70,000}$

Current ratio = 2:1

Liquid ratio $= \frac{\text{Liquid (or)quick assets}}{\text{Liquid liabilities}}$

Liquid assets = Current assets-(stock + prepaid expenses)

= 1,40,000 – (50,000 + 5,000)

= 85,000

Liquid liability = Current liability – (Bank overdraft)

= 70,000 – 0

= 70,000

Liquid ratio $= \frac{85,000}{70,000}$

Liquid ratio = 1.21:1

Prob 2

Calculate absolute Liquid ratio from the following information.

Goodwill	4,15,000
Plant & Machinery	4,00,000
Trade investment	2,00,000
Marketable security	1,50,000
Bills receivable	40,000
Cash in hand	45,000
Cash at bank	30,000
Inventory	75,000
Bank overdraft	70,000
Sundry creditors	60,000
Bills payable	90,000
Outstanding expenses	30,000

Solution :

Absolute Liquid Ratio $= \frac{\text{Absolute liquid assets}}{\text{Current liabilities}}$

Absolute liquid assets = Marketable security +Cash in hand + Cash at bank

= 1,50,000+45,000+30,000

Absolute liquid assets = 2,25,000

Current liabilities = Bank overdraft + Creditors +Bills payable + Outstanding exp

= 70,000+60,000+90,000+30,000

= 2,50,000

Absolute Liquid Ratio $= \frac{2,25,000}{2,50,000}$

Absolute Liquid Ratio **= 0.9:1**

Prob 3.

From the following Balance sheet of Even green ltd 31st Dec 1998. Calculate solvency ratio.

Liabilities	Amount (Rs.)	Assets	Amount (Rs.)
Equity share capital	1,00,000	Fixed assets 3,60,000	
7% pref. share capital	20,000	(-) Dep : 1,00,000	2,60,000
Reserves & surplus	80,000	Stock	60,000
6% Debentures	1,40,000	Debtors	40,000
Creditors	12,000	Investment(govt. sec)	30,000
Bills payable	20,000	Cash	10,000
Outstanding expenses	2,000		
Taxation provisions	26,000		
	4,00,000		4,00,000

Additional information :

(i) Net sales 6,00,000

(ii) Cost of goods sold 5,16,000

(iii) Net income before tax 40,000

(iv) Net income after tax 20,000

Solution :

In order to calculate solvency we have to compute

(i) Current ratio

(ii) Liquid ratio

(iii) Proprietory ratio

(iv) Debt –equity ratio

(v) Fixed asset to proprietory fund ratio

(vi) Interest coverage ratio

(i) Current ratio $= \frac{\text{Current asset}}{\text{Current liability}}$

Current asset = Stock + debtors + short term investment + cash

= 60,000+40,000+30,000+10,000

= 1,40,000

Current liability = Creditors + Bill payable + Outstanding exp + Tax pro.

= 12,000+20,000+2,000+26,000

= 60,000

Current ratio = $\frac{1,40,000}{60,000}$

Current ratio = 2.33:1

(ii) Liquid ratio = $\frac{\text{Liquid asset}}{\text{Liquid liability}}$

Liquid asset = Current asset – (stock + Prepaid exp)

= 1,40,000-60,000

= 80,000

Liquid liability = Current liability-Bank OD

= 60,000-0

= 60,000

Liquid ratio = $\frac{80,000}{60,000}$

Liquid ratio = 1.33:1

(iii) Proprietory ratio = $\frac{\text{Proprietory fund}}{\text{Total tangible asset}}$

Proprietory fund = Equity share cap + pref. share capita l+ res. & surplus

= 1,00,000+20,000+80,000

= 20,000

Total tangible asset = 4,00,000

Proprietory ratio = $\frac{2,00,000}{4,00,000}$

Proprietory ratio = 0.5:1

(iv) Debt equity ratio = $\frac{\text{Debt}}{\text{Equity}}$

Debt = Debentures + Creditors + Bills payable + Tax Provision

= 1,40,000+12,000+20,000+2,000+26,000

= 2,00,000

Equity = Equity share cap. + Pref.Sh.Cap. + Reserves & Surplus

= 2,00,000

Debt equity ratio $= \frac{2,00,000}{2,00,000}$

Debt equity ratio = 1:1

(v) Fixed assets to proprietory ratio :

Fixed assets to proprietory ratio $= \frac{\text{Fixed asset (after dep \& } tax)}{\text{Proprietory fund}}$

Fixed asset = 2,60,000

Proprietory fund = 2,00,000

Fixed assets to proprietory ratio $= \frac{2,60,000}{2,00,000}$

Fixed assets to proprietory ratio = 1.3:1

(vi) Interest coverage ratio :

Interest coverage ratio $= \frac{\text{Net profit before tax and interest}}{\text{Interest charges}}$

Net profit before tax and interest = Net profit before tax + interest on debenture

= 40,000+(6% on 1,40,000)

= 40,000+8,400

= 48,400

Interest charges = Debenture interest

Interest coverage ratio $= \frac{48,400}{8,400}$

Interest coverage ratio = 5.76:1