Chapter - 2:

Ratio Analysis:

→ Relationship between two accounting figures is known as ratio.

→ Sometimes single accounting value may not communicate meaningful result but when it is expressed with other accounting values/figures then it provide more meaningful result.

→ For example:

	X Ltd.	Y Ltd.
Net profit	1000 cr	600 cr.

On the basis of Net profit we can say performance of X Ltd is better than Y Ltd.

However, our opinion may change if we use ratio of Net profit expressed with another accounting figures (like Sales, Investment etc.).

	X Ltd	Y Ltd
Investment	10,000 cr.	4000 cr.
Sales	20.000 cr.	3000 cr.

Some ratios:

	X Ltd.	Y Ltd
Net profit ratio	$\frac{1000}{20,000} \times 100$ = 5%	$\frac{600}{3000} \times 100$ = 20%
Return on investment	$\frac{1000}{10.000} \times 100$ = 10%	$\frac{600}{4000} \times 100$ = 15%
No. of times sale generated by investment	$\frac{20.000}{10.000}$ = 2 times	$\frac{3000}{4000}$ = 0.75 times.
Total exp. ratio	100% - 5% = 95%	100% - 20% = 80%

Analysis:

(i) Total expense ratio of X Ltd is higher than Y Ltd. As a result

net profit ratio of x Ltd is lower.

If x Ltd reduces its expense from 95% to 80% then net profit ratio increases to 20%.

[i.e. Net profit = 20,000 x 20% = 4000 Cr.]

It means Net profit can be increased by 300% [i.e. 1000 cr to 4000 cr.

$$= \left[\frac{4000-1000}{1000} \times 100\right] = 300\%$$

(ii) Sales generating capacity of y Ltd. is lesser than x Ltd.

If y Ltd. sales become 2 times of investment then

Sale of y = 4000 x 2 times = 8000 cr.

In this situation it may generate net profit of ₹ (8000 x 20%) = 1600 cr. which is higher than x Ltd net profit.

Note: One can analyse these things by comparative study only and this comparative study is ratio analysis.

⇒ Ratio can be calculated by comparing:

(i) Two accounting figures of same entity for same year.

(ii) one accounting figure of different years.

(iii) one accounting figure of a company with another company / Industry.

Industry ⇒ Group of similar business companies

(iv) one ratio of a company with another company / Industry.

⇒ No. of ratios are unlimited. we can generate own ratio by keeping in mind the objective of company / analysis.

There are approximately 50 ratios which are specific and we have to remember it. others are general, whose name itself communicates formula. No need to remember it.

For example:

(i) Fixed Assets to sale ratio = $\frac{FA}{Sale}$

(ii) Fixed Assets to credit sale ratio

$= \frac{\text{Fixed Assets}}{\text{credit sale.}}$

Some specific ratios (we have to remember it)

(i) Fixed Assets turnover ratio

$= \frac{\text{Sales}}{\text{Fixed Assets}}$

(ii) current ratio = $\frac{\text{current Assets}}{\text{current liabilities}}$

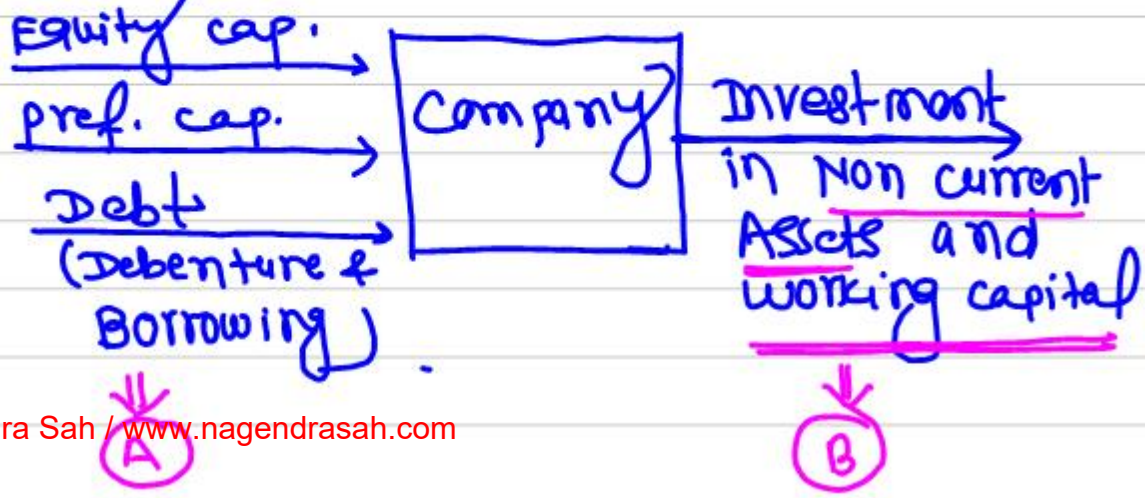
Concept: Some basic concepts related to working of the company:

→ Let us form a company to understand entire concepts.

→ Company is a legal entity (without any physical existance) formed to deal fairy with investors (i.e owner - Equity holder and outsiders → preference holder, Debenture holder, money lender) and to raise huge fund required for buisness.

Company never think for own benefit. It alwdys thinks for owners benefit (i.e. Equity holders).

⇒ Raising fund by company:



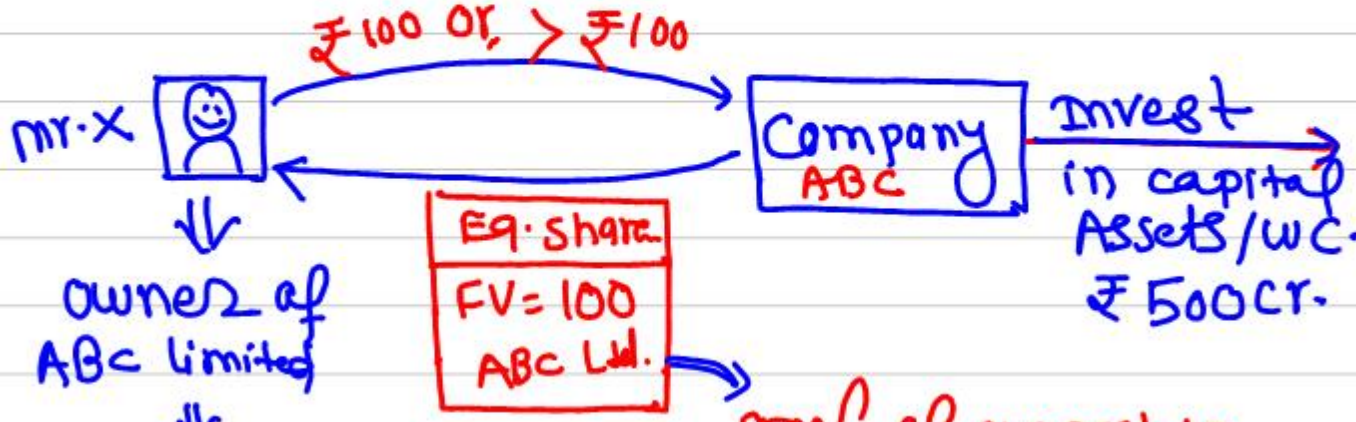
A ⇒ Capital [Eq + pref + Debt]

B ⇒ Long term investment in business (Non current Assets + WC)

A = B

(I) Raising fund by way of Equity cap.

- Equity holders are owner of company.



Suppose, mr. X invested ₹ 10cr. In this case we can say he has ownership of 2% (ie. 2% right in profit/Assets).

(II) Raising fund by way of preference capital.

- preference share holder receives fixed income from company.
- preference holder has priority over equity holder (i.e. First priority → preference holder ; Second priority → Equity holder) in profit / repayment.

→ 10% preference capital ⇒ 20 cr.

→ If company earn profit then preference holders receive dividend @10%. Total dividend = 20 × 10%
= 2 cr.

→ preference holder receives dividend on face value irrespective of investment amount

(III) Raising fund by way of debenture/Bond

- Debenture holder receives fixed interest from company on face value irrespective of investment amount.
- whether company earn profit or make loss, it has to pay interest.
- company has to pay interest before paying dividend to preference holder.
- He can't ask company to repay before maturity but he can transfer debetture to other.

(IV) Raising fund by way of Borrowing:

- money lender receives fixed interest from company on money lended.
- There is no concept of face value.
- company has to pay interest to money lender before paying dividend to preference holder.
- He can't ask company to repay money before maturity. In other words, he can't get money back before maturity

Note:

① Comparison between debenture & Borrowing/ lending money

Debenture	loan
• Interest on face value	• Interest on money lended.
• Can realise fund any time by transfering debenture to other	• Can't realise fund before maturity.

↳ Long term.

② Debt is a category which consists Debenture/Bond and long term borrowing.

③ Bond & Debenture are same instrument: There is small difference on the part of issuer.

Bond ⇒ Issued by Government/PSU

Debenture ⇒ other companies.

Concept: Analysis of financial statement of a company:

(A) Analysis of Balance sheet:

B/S of ABC Ltd. (1st day of co. formation)

Equity & liab.		Assets	
Equity	1100	plant & m	1000
12% pref.	500	Furniture	600
10% Debt	400	Building	240
			1840
			160 → working cap.
Current L.	200	Current A.	360
	2200		2200

capital employed

Summary:

Capital employed = Non current Assets + working capital

↓ long term funding

↓ long term investment

Where

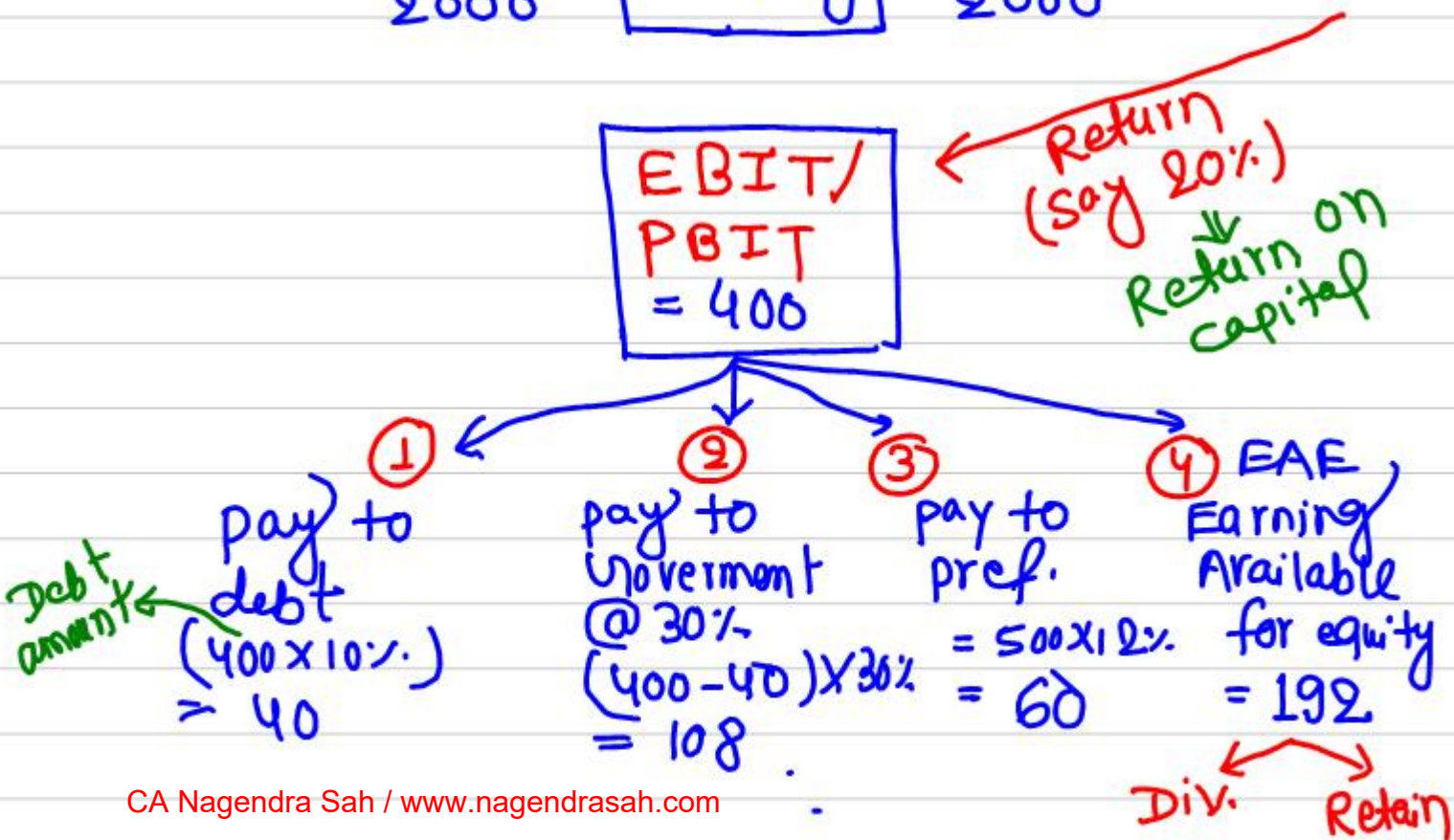
Working capital = Current Assets − Current liability

OR,

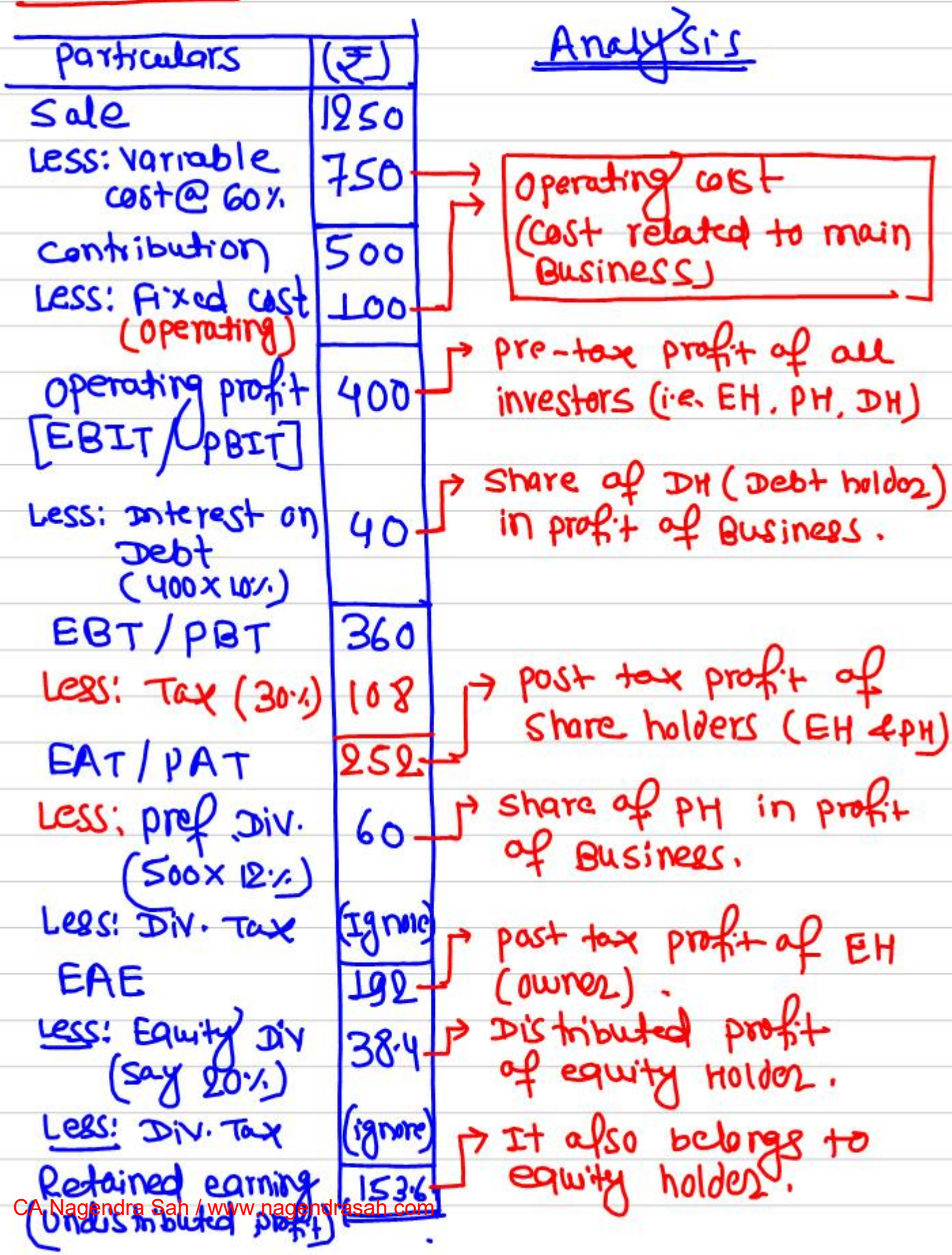
Capital employed − Non current Assets

working capital funding is long term funding (i.e. Raise fund by way of Equity, preference & Debt).

After 1 years:



we can present it in Income Statement as follows:



Where,

EBIT = Earning Before Interest and Tax.

PBIT = profit Before Interest and Tax

EBT = Earning Before tax

PBT = profit Before tax

EAT = Earning after tax

EAE = Earning available for Equity

Retained earning ⇒ Reserve

EH = Equity holder.

Some ratios (can be calculated easily from above)

① Return on capital employed (pre-tax)

= 20% (i.e. $\frac{400}{2000} \times 100$)

Post tax ROCE = 20% X (1-T)

= 20% X .70

∵ (1-.30) = .70

= 14%

(For more Refer profitability ratio)

(ii) Return on Equity (ROE):

Earning of equity = 192

Investment of Equity holder = 1100

$$ROE = \left(\frac{192}{1100} \times 100\right) = 17.45\%$$ (post tax)

Note: Investment of equity holder = Equity cap + Retained Earning

If we calculate next year ROE then investment should by

$= (1100 + 153.60) = 1253.60$

But ROE (i.e % return) may remain same if we re-invest retained earning at ROE.

(iii) EPS ⇒ Earning per share: (Always for Equity)

Assume Face Value = ₹10

No. of equity share = $\frac{1100}{10} = 110$

On 110 share ⇒ Earning is 192

On 1 share ⇒ " " $\left(\frac{192}{110}\right) =$ 1.745

∴ EPS = 1.745

(iv) DPS ⇒ Dividend per share (Always for Equity)

On 110 shares ⇒ Dividend is 38.4

on 1 share ⇒ " " $\left(\frac{38.4}{110}\right)$

$= \boxed{0.349}$

∴ DPS = 0.349

(v) payout ratio (Dividend payout ratio)

(% distributed profit) → Always for equity.

In our example it is 20%.

EAE = 192

payout (i.e. Dividend) ⇓ 38.40

$\text{Ratio} = \left(\frac{38.40}{192} \times 100\right)$ [i.e. $\frac{\text{Div}}{\text{EAE}} \times 100$]

or, $= \left(\frac{0.349}{1.745} \times 100\right)$ [i.e. $\frac{\text{DPS}}{\text{EPS}} \times 100$]

(Vi) Retention ratio (% undistributed profit)

↳ Always for equity.

In our example it is 80%.

EAE = 192

- payout (Dividend)
- Retained Earning 153.60

$$\% \text{ ratio} = \left[\frac{153.60}{192} \times 100\right]$$

$$= 80\%$$

On the basis of per share data:

REPS (Retained Earning per share)

$$= \frac{153.60}{120 \text{ Share}} = \boxed{1.396}$$

$$\% \text{ retention} = \left(\frac{1.396}{1.745} \times 100\right) = 80\%$$

Formula:

(i) Retention ratio (RR) = 100% − payout ratio

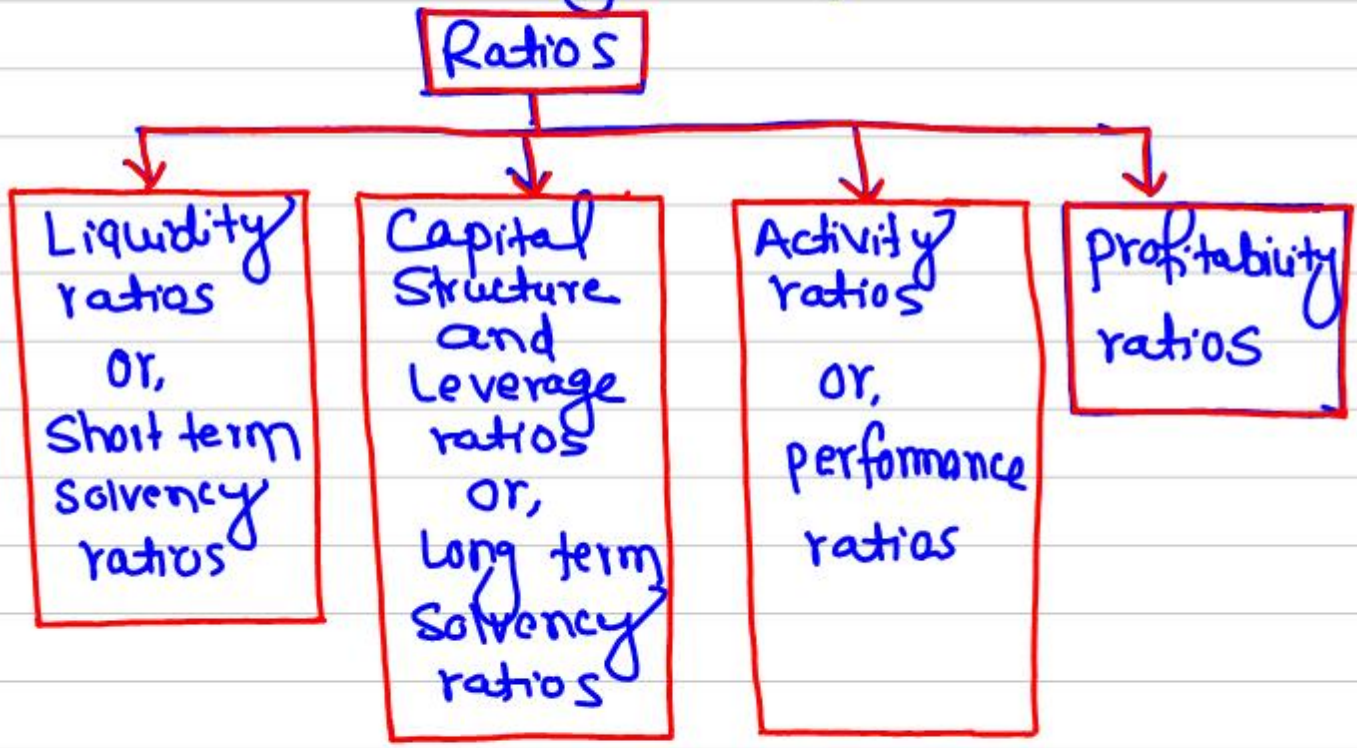
∴ payout ratio + Retention ratio = 100%

(ii) $RR = \frac{\text{Retained Earning}}{EAE} \times 100$

(iii) $RR = \frac{REPS}{EPS} \times 100$.

Concept: Different categories of ratios:

There are four categories of ratios:



(A) Liquidity ratios:

→ Ability to convert assets into cash is known as liquidity and current Assets can be converted into cash within short time period. Hence current Assets provide liquity in busines..

→ Liquidity ratios are related to current Assets and current liabilities.

B/S of a company

Equity & Liab.	₹	Assets	₹
Equity cap.	xxx	Non current Assets	xxx
Retained Earn.	xxx		
preference	xxx		
Long T. Debt	xxx		
Current Liab.		**Current Assets.**	
• Trade payable (creditor)	xxx	• Trade receivab. (Debtors)	xxx
• outstanding exp	xxx	• Stock [material, WIP & FG]	xxx
• Bank OD	xxx	• cash and Bank	xxx
• Other CL.	xxx	• prepaid exp.	xxx
		• Other CA.	xxx
	xxx		xxx

Liquidity Ratios

(1) Current ratio (or, working capital ratio)

- proportion of current Assets and current liabilities is known as current ratio.
- $$\text{Current ratio} = \left[\frac{\text{Current Assets}}{\text{Current liabilities}}\right]$$
- Standard current ratio of manufacturing industry is 2 (i.e. ₹ 2 current Assets for ₹ 1 Current liabilities).
- Current ratio less than 2 times indicate liquidity problem (i.e. company may face problem to pay short term liab.)
- Current ratio more than 2 times indicates inefficient utilisation of fund.

② Quick ratio (or, Acid test ratio or, Liquid ratio)

- Quick Assets are assets that can be converted into cash within very short time period.
- Stocks and pre-paid expenses are excluded from quick assets on the assumption that it can't be realised within very short time period.

∴ Quick Assets = [Current Assets − Stocks − prepaid exp]

- **Quick ratio = Quick Assets / current liabilities**

prefer this one

- Suggested quick ratio for manufacturing industry is "1".
- Sometimes we may see quick ratio using quick liabilities

i.e. Quick ratio = Quick Assets / Quick liabilities

∵ Quick liabilities = (Current liab − BANKOD)

③ Cash ratio (or. Absolute liquid ratio)

$$\text{Cash ratio} = \frac{\text{Cash \& Bank + marketable securities}}{\text{current liabilities}}$$

It indicates short term liquidity in terms of cash & marketable securities.

④ Basic defense Interval / Interval measure:

- Basic defense interval indicates the number of days that a company can operate without needing to access other assets (long term)
- Basic defense interval

$$= \left[\frac{\text{Cash \& Bank bal + marketable secur.}}{\text{Daily cash operating exp.}}\right]$$

OR,

$$= \left[\frac{(\text{Current Assets} - \text{Stock})}{\text{Daily cash operating exp.}}\right]$$

Where,

$$\text{Daily cash operating expenses} = \frac{\text{COGS} + \text{AOH} + \text{SDOH} - \text{Non cash exp (like Dep.)}}{\text{360 days or 365 days}}$$

Where,

COGS = cost of goods sold
(i.e. material consumed
+ Direct labour
+ Factory overhead
+ Adjustment of stock)

AOH ⇒ Administration overhead
(Office expense)

SDOH ⇒ selling and distribution overhead
(Sales expenses)

Example:

Annual operating cash expenses = 120,000

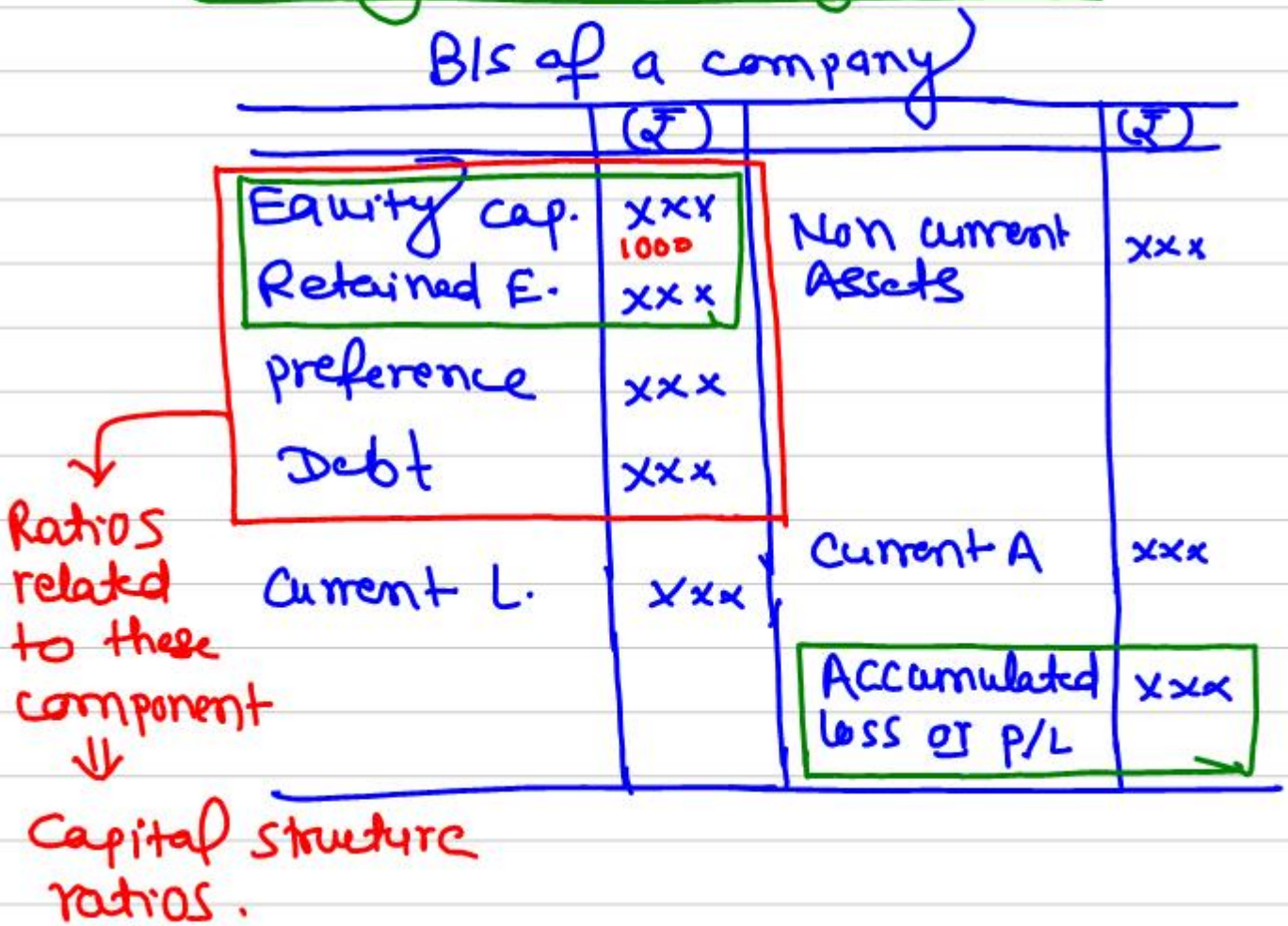
Daily exp = $\frac{120,000}{360}$ = 333.33

Cash & marketable security = 3,333

∴ Basic defense interval = $\frac{3,333}{333}$ = 10 days

Hence, we can say company can run business for 10 days with available cash & security

(B) Capital structure and leverage ratio or, long term solvency ratio



Note!

- Accumulated loss is part of equity.

  ∴ Equity = Equity cap + Retained Earning/Reserve − Accumulated loss.

- Shareholder's Equity = Equity + preference.
- Generally, Equity holders are owner of company. In this case, preference

Share holder and Debt holders are outsiders.

- Sometimes we consider preference capital as owner's fund when preference holders get voting right due to non payment of dividend. In this case, Share holder's Equity is owner's fund and Debt holders are outsider.

Long term solvency ratios are further divided into two sub categories:

(a) capital structure ratio
(b) coverage ratio

(a) capital structure ratios:

(5) Equity ratio:

It indicates proportion of equity in respect to total capital (capital employed)

$$\text{Equity ratio} = \left[\frac{\text{Equity}}{\text{capital Employed}}\right]$$

Where. Equity = Equity cap + Retained Earning/Reserve − Accumulated loss.

Sometimes, we may use Shareholders' Equity to calculate Equity ratio.

$$\text{Equity ratio} = \left[\frac{\text{Shareholders' Equity}}{\text{capital Employed}}\right]$$

⑥ preference ratio:

- proportion of preference in total capital

$$\text{preference ratio} = \left[\frac{\text{preference cap.}}{\text{capital employed}}\right]$$

⑦ Debt ratio:

Debt ratio indicates proportion of Debt (i.e. Debenture + long term Borrowing) in total capital.

$$\text{Debt ratio} = \left[\frac{\text{Debt}}{\text{capital employed}}\right]$$

Note: Sometimes debt ratio can be calculated using total debt also (i.e. long term debt + short term Borrowing).
In this case better to use total Assets.
(i.e. $\frac{\text{Total Debt}}{\text{Total Assets}}$) → Also termed as Total debt to Assets ratio.

(8) Debt Equity ratio:

$$\text{Debt Equity ratio} = \left[\frac{\text{Debt}}{\text{Equity}}\right]$$

Where,

Debt = Long term Debt
(i.e. Debenture + Long T. B)

Equity = Eq. cap + Retained E
− Accumulated loss.

Sometimes, we may use Shareholders' Equity also in DE ratio.

∴ Debt Equity ratio = $\left[\frac{\text{Debt}}{\text{Shareholders' Equity}}\right]$

Analysis:

→ Debt Equity ratio is useful for risk analysis for owner.

→ High Debt equity ratio indicates high risk to owner or vice versa.

(9) Capital Gearing ratio (or, Gearing ratio)

Capital Gearing ratio

$$= \left[\frac{\text{Fixed cost bearing capital}}{\text{Non fixed cost bearing cap.}}\right]$$

$$= \left[\frac{\text{pref cap + Debt}}{\text{Equity}}\right]$$

where Equity ⇒ E. cap + Reserve − Accumulated loss.

Analysis:

- Same as Debt Equity ratio

(10) proprietary ratio (or proprietary fund ratio).

Proprietary fund is Shareholders' Equity

It means:

$$\text{Proprietary ratio} = \left[\frac{\text{proprietary fund}}{\text{Capital employed / Total Assets}}\right]$$

(b) Coverage ratio:

- Coverage ratio provides relationship between "fixed claim" of investors in company and what is normally available out of which these claims are to be paid.
- Fixed claim may be:
  - → Interest on debenture
  - → Dividend on preference
  - → Installment on Borrowings (principal + interest).
- Analysis of Income statement: ⊃

Particulars	(₹)	
EBDIT	xxx	⟹ Available to pay Installment
Less: Depreciation	xxx	
EBIT	xxx	← EBIT covers fixed interest (ICR)
Less: Interest	xxx	
EBT	xxx	
Less: Tax	xxx	
EAT	xxx	← EAT covers fixed pref div. (PDCR)
less: pref. Div	xxx	
EAE	xxx	← EAE covers Equity dividend (EDCR)
less: Equity Div	xxx	
Retained E.	xxx	

Ratios:

(11) Debt service coverage ratio (DSCR)
or, Installment coverage ratio or Fixed charge ratio.

$$DSCR = \left[\frac{EBDIT}{\text{Annual installment}}\right]$$

Where,
EBDIT = Earning Before Depreciation Interest and Tax

Annual installment = Interest + principal.

Note: If there is loss/gain on Sale of fixed Assets then we have to adjust it in numerator.
∴ EBDIT + loss of FA - Gain on FA.

(12) Interest coverage ratio:

$$ICR = \left[\frac{EBIT}{\text{Annual interest}}\right]$$

(13) preference dividend coverage ratio (PDCR)

$$PDCR = \left[\frac{EAT}{\text{Annual pref. dividend}}\right]$$

(14) Equity dividend coverage ratio

$$EDCR = \left[\frac{EAE}{\text{Annual equity dividend}}\right]$$

Note:

- Coverage ratio is risk analysis from investor's point of view.
- High coverage ratio ⇒ low risk to investor.
  Low coverage ratio ⇒ High risk to investor.
- Debt holder uses Debt service coverage ratio and Interest coverage ratio
  - preference holder uses pref. dividend coverage ratio
  - Equity holder uses Eq. dividend Coverage ratio.

(C) Activity ratios or performance ratios or, efficiency ratios or Turnover ratios

→ These ratios evaluate the efficiency with which the firm manages its resources (i.e. Fixed Assets, current Assets Total Assets, working capital etc.) to generate sale.

→ General formula = $\left[\frac{\text{Sale / cons / ...}}{\text{Resources.}}\right]$

Resources are:

B/S of a company

(5) Capital Empl.	x	Fixed Assets	xxx	(1)
Current liab.	x	Current Assets	xxx	(2)
(4) working capital • Trade payable. (creditor) (9)	x	• Trade Receiv	xxx	(6)
		• Raw m Inv.	xxx	(7)
		• FG Invent.	xxx	(8)
	x	Total Assets	xxx	(3)

Ratios

(15) Fixed Assets turnover ratio (FATOR)

$$= \left[\frac{\text{Sales/Cons}}{\text{Fixed Assets}}\right] \text{ or, } \left[\frac{\text{Sales/Cons}}{\text{Average F.A.}}\right]$$

(16) Current Assets turnover ratio

$$= \left[\frac{\text{Sales/Cons}}{\text{Current Assets or average C.A.}}\right]$$

(17) Total Assets turnover ratio:

$$= \left[\frac{\text{Sales/Cons}}{\text{Total Assets or average total A.}}\right]$$

(18) working capital turnover ratio:

$$= \left[\frac{\text{Sales/Cons}}{\text{working capital or, Average W.C.}}\right]$$

(19) capital turnover ratio:

$$= \left[\frac{\text{Sales/Cons}}{\text{capital or average capital}}\right]$$

(20) Receivable turnover ratio or, Trade receivable turnover ratio or, Debtor turnover ratio.

$$= \left[\frac{\text{Credit sale}}{\text{Trade receivable or average trade receivable}}\right]$$

(21) Raw material inventory turnover ratio

$$= \left[\frac{\text{material consumed}}{\text{RM Inventory or Average RM Inventory}}\right]$$

(22) Finished goods inventory turnover ratio or, Inventory turnover ratio

$$= \left[\frac{\text{COGS}}{\text{FG inventory or, Average FG Inv.}}\right]$$

(23) payable turnover ratio or, creditor turnover ratio

$$= \left[\frac{\text{Credit purchase}}{\text{T. payable or average trade payable}}\right]$$

Notes:

→ Debtor is also termed as Trade receivable or Account receivable.

→ Creditor is also termed as Trade payable or account payable.

(24) Collection period or Receivable period or, Debtor collection period or Debtor velocity:

$$= \left[\frac{\text{360 days or. 365 days or, 12 months or, 52 weeks}}{\text{Receivable turnover ratio}} \right]$$

Alternatively, we may use unitary method to calculate collection period.

Say, Annual credit sale = 12000

T. Receivable = 1000

12000 Credit Sale ⇒ 12 months

1 " " ⇒ $\frac{12}{12000}$ "

1000 " " ⇒ $\left(\frac{12}{12000} \times 1000\right)$

= 1 month

we can use it as formula also.

$$= \left(\frac{\text{Average debtor}}{\text{Credit sale}} \times 12m \text{ or, } 360d \text{ or, } 365d \text{ or } 52w \right)$$

(25) Creditor payable period or, Trade payable period or payable velocity.

$$= \left[\frac{360d / 365d / 12m / 52w}{\text{payable turnover ratio}} \right]$$

OR,

$$\left(\frac{\text{Trade payable or, Average T. payable}}{\text{Credit purchase}} \times (360d / 365d / 12m / 52w) \right)$$

(26) Raw material inventory holding period

$$= \left[\frac{360d/365d/12m/52w}{\text{RM inventory Turnover ratio}}\right]$$

OR,

$$\left(\frac{\text{RM Inventory or Avg. material consumed}}{\text{material consumed}} \times 360d/365d/12m/52w\right)$$

(27) Finished goods inventory holding period

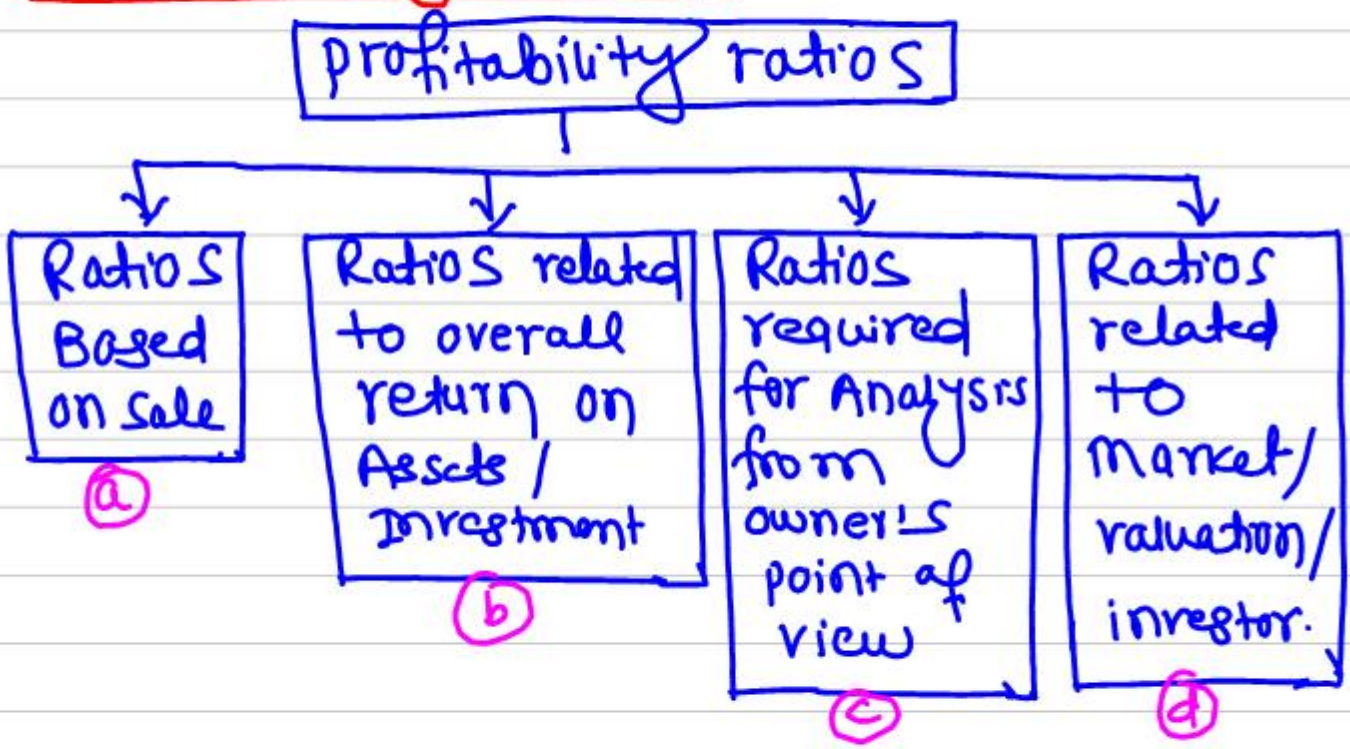
$$= \left[\frac{360d/365d/12m/52w}{\text{FG inventory Turnover ratio}}\right]$$

OR,

$$= \left[\frac{\text{FG Inventory or. Avg}}{\text{COGS}} \times 360d/365d/12m/52w\right]$$

Concept:

(D) profitability ratios:



(a) Ratios Based on sale:

(28) Gross profit ratio or Gross profit margin

$$= \left[\frac{\text{Gross profit}}{\text{sale}} \times 100\right]$$

(29) Net profit ratio or, Net profit margin

$$= \left[\frac{\text{Net profit}}{\text{Sale}} \times 100\right]$$

(30) Contribution margin or, P/V ratio or, contribution ratio

$$= \left(\frac{\text{Contribution}}{\text{Sale}} \times 100\right)$$

Where,

Contribution = Sale - variable cost

P/V ratio = profit volume ratio

(31) Operating profit margin or operating profit ratio or EBIT margin

$$= \left[\frac{\text{EBIT / operating profit}}{\text{Sale}} \times 100\right]$$

(32) COGS ratio

$$= \left[\frac{\text{COGS}}{\text{Sales}} \times 100\right]$$

(33) Operating expense ratio:

$$= \left[\frac{\text{Operating expense}}{\text{sales}} \times 100\right]$$

Where,

Operating expense = Admin OH + selling & dist OH.

(34) Operating ratio :

$$= \left[\frac{\text{Cons} + \text{operating exp.}}{\text{Sales}} \times 100\right]$$

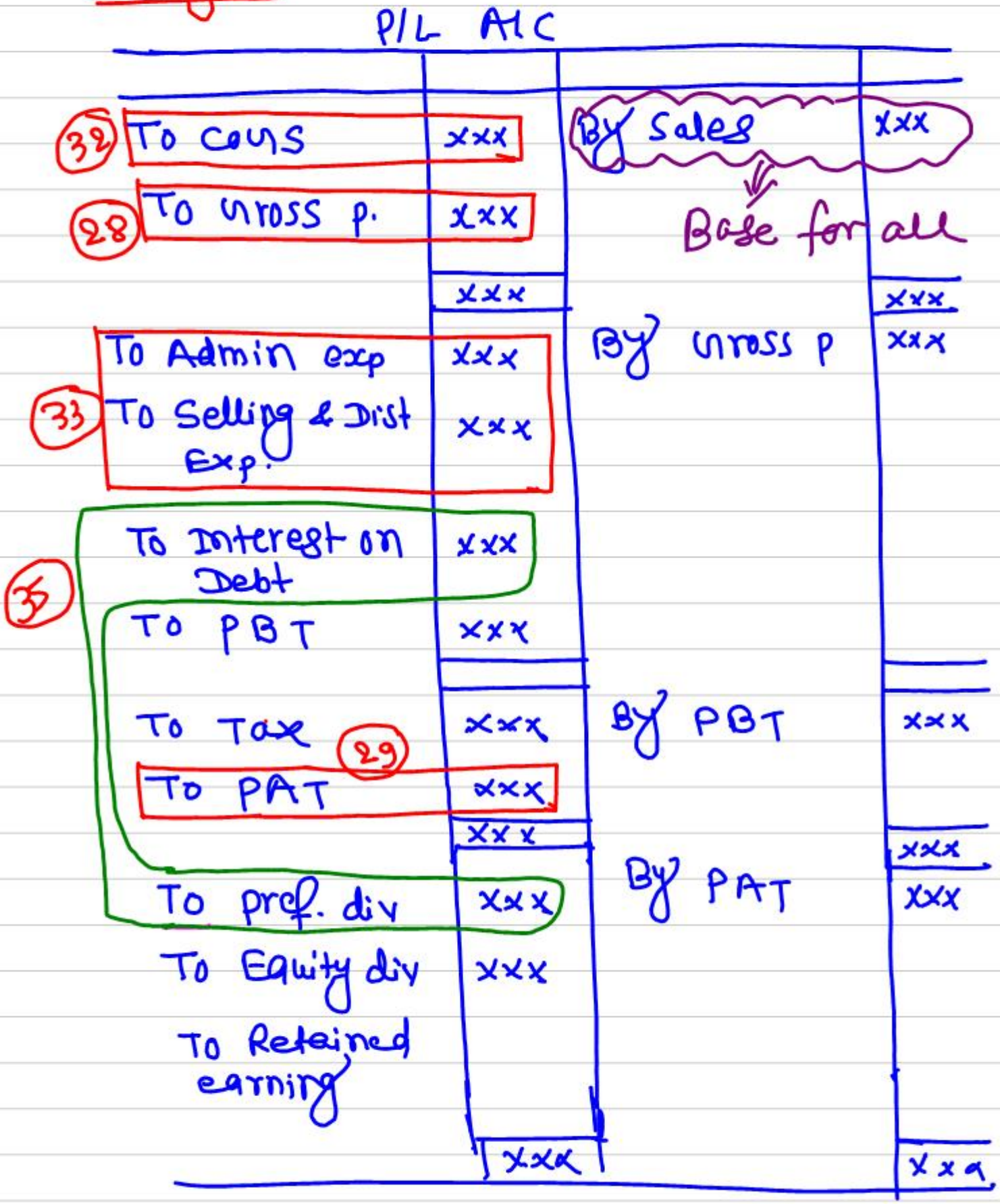
(35) Financial expense ratio :

$$= \left[\frac{\text{Financial expense}}{\text{Sales}} \times 100\right]$$

Where,

Financial exp = [Interest on debt + Dividend on preference.]

Analysis:


P/L A/C
32
To Cons xxx
28
To Gross p. xxx
xxx
To Admin exp xxx
33
To Selling & Dist Exp. xxx
35
To Interest on Debt xxx
To PBT xxx
To Tax xxx
29
To PAT xxx
xxx
To pref. div xxx
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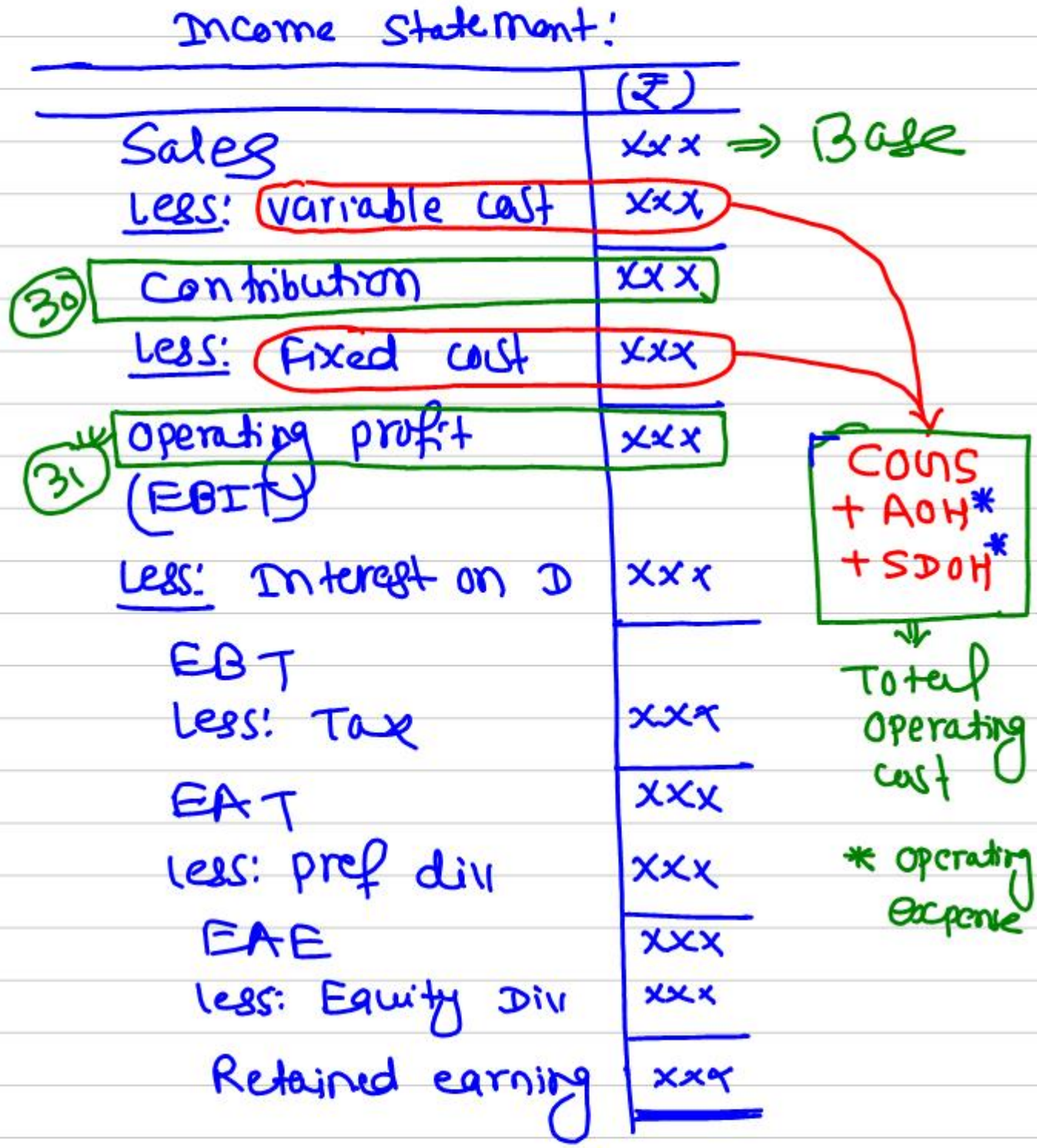


⇒ Operating ratio ⇒ Total operating cost ratio

Operating ratio + operating profit margin = 100%.

(b) Ratios related to return on Investment

General meaning of return ⇒ % earning

⇒ Return (General rule) = $\left(\frac{\text{Earning/profit}}{\text{Investment}} \times 100\right)$

(36) Return on capital employed (ROCE)

$$\text{ROCE (pre tax)} = \left(\frac{\text{EBIT}}{\text{CE or Average CE}} \times 100\right)$$

Where,
CE = capital Employed.

ROCE (post tax) = pre-tax ROCE x (1-T)

EAT + [I x (1-T)] ← OR = $\left(\frac{\text{EBIT} \times (1-T)}{\text{CE or, Average}} \times 100\right)$

Where,
T = Tax rate (in decimal)
Say tax rate = 30%
(1-T) = (1-.30) = .70 → 70% Net of tax

Logic behind "EBIT x (1-T)"

→ You may think EBIT x (1-T) is wrong because we never pay tax on EBIT.

→ We are logically correct because post tax ROCE is post tax return of all investors. (EH, PH & DH)

post tax earning of PH & DH = EAT

post tax Earning of DH = Interest x (1-T)

∴ post tax earning of all three

= EAT + [Int x (1-T)]

= [EBT x (1-T)] + [Int x (1-T)]

= (1-T) [EBT + Int]

∴ **EBIT x (1-T)**

Sometimes we may use following formula for post tax ROCE.

$$= \left(\frac{PAT + Int.}{CE \text{ or. } Average} \times 100 \right)$$

(37) ROA (Return of Assets)

$$\text{ROA (pre tax)} = \left(\frac{\text{EBIT}}{\text{Total Assets or Average}}\right) \times 100$$

$$\text{ROA (post tax)} = \left(\frac{\text{EBIT} \times (1-T)}{\text{Total Assets or, Average}}\right) \times 100$$

Sometimes, we may use profit after tax to calculate ROA.

$$\text{ROA} = \left(\frac{\text{PAT}}{\text{Total Assets or, Average}}\right) \times 100$$

Note:

→ If we use "Fixed Assets" then it becomes return on fixed Assets.
If we use "Net Assets" then it becomes return on Net Assets etc.

→ we may exclude intangible assets from total Assets.

(38) Return on Equity (ROE)

$$ROE = \left[\frac{EAE}{Equity} \times 100\right]$$

OR,

$$= \left[\frac{EAT}{Share\ holders'\ Equity} \times 100\right]$$

Note!
If we assume preference is part of owner's fund (i.e. use Share holders' Equity) then use EAT as earning.
Reason ⇒ Investment is of two investors. Earning should also be of two investors.

⇒ ROE using the Du pont model

$$ROE = \left[\frac{EAE/EAT}{Sale} \times \frac{Sale}{Total\ Assets\ or\ Capital} \times \frac{Total\ Assets/capital}{Equity/Share\ holders\ Equity}\right]$$

It means,

ROE = (Net profit margin x Assets/capital turnover ratio x Equity multiplier)

Summary,

we have to calculate three ratios under Du pont model for ROE-

(i) Net profit margin
(ii) Assets/capital turnover ratio
(iii) Equity multiplier

Interpretation:

Above three ratios are also termed as Return on investment (ROI) because Capital Employed/Assets/Equity are investments.

$$ROI = \left[\frac{\text{Earning related to investment}}{\text{Investment}} \times 100\right]$$

Some times we use two different ratios to calculate ROI.

$$ROI = \left(\frac{\text{Earning in respect to investment}}{\text{Sale}} \times \frac{\text{Sale}}{\text{Invest}}\right)$$

$\therefore$ ROI = (Earning margin × Turnover ratio)

Concept:

(C) Profitability ratios required for Analysis from owner's point of view

(39) Earning per share (EPS)

$$= \left[\frac{EAE}{\text{No. of Equity share}}\right]$$

(40) Dividend per share (DPS)

$$= \left[\frac{\text{Dividend amount}}{\text{No. of Equity share}}\right]$$

(41) Dividend pay out ratio (or, pay out ratio)

$$= \left[\frac{DPS}{EPS} \times 100\right] \text{ or, } \left[\frac{\text{Total Dividend}}{EAE} \times 100\right]$$

(42) Retention ratio

= 100% − pay out ratio in %

OR,

= 1 − pay out ratio in decimal

OR,

$$= \left(\frac{\text{Retained Earning}}{\text{EAE}} \times 100 \right)$$

OR

$$= \left(\frac{\text{REPS}}{\text{EPS}} \times 100 \right)$$

$\because$ REPS = Retained Earning per share

$$= \left[\frac{\text{Retained Earning}}{\text{No. of Equity sh.}} \right]$$

5300
530

Concept:

(d) profitability ratios related to market/ valuation / Investors:

(43) Book Value per share (BVPS):

$$= \left[\frac{\text{Equity cap} + \text{Reserve}}{\text{No. of Equity share}} \right]$$ → Retained Earning

It indicates balancesheet value of 1 Equity share (i.e. Realisable value of 1 share if company liquidates today).

Note: Intrinsic value ⇒ fair value

Sometimes Book value of share is also termed as Intrinsic value.

Note: market price of share (MPS)

price at which shares are traded in stock Exchange. It depends upon somany factors. It may be higher than Book value or may be lower than Book value.

Future growth of company is very high
⇒ market price very high

or. vice versa.

(44) price to Book value (or, market price to Book value ratio)

$$= \left[\frac{MPS}{BVPS}\right]$$

High price to BV ratio ⇒ costly share

Example: Bajaj finance ⇒ 10 times.
Asian paints ⇒ 25 times.

(45) price Earning ratio (P/E ratio)

$$= \left[\frac{MPS}{EPS}\right]$$

High P/E ratio ⇒ costly share

(46) Earning Yield:

Return of equity holder on market price of share (i.e. current investment through stock Exchange)

$$= \left(\frac{EPS}{MPS} \times 100\right) \quad OR, \left[\frac{1}{P/E \text{ ratio}}\right]$$

(47) Dividend Yield:

$$= \left(\frac{DPS}{MPS} \times 100\right)$$

(48) Q ratio:

Ratio given by James Tobin.

$$Q \text{ ratio} = \left[\frac{\text{Market value of company}}{\text{Replacement cost of Assets}}\right]$$

Where,

market value of company
= market value of Equity + prf + Debt.

Q ratio = 1 ⇒ Equilibrium

Q ratio < 1 ⇒ Stock is undervalued

Q ratio > 1 ⇒ Stock is overvalued.

Bye Bye ratios

ABC to XYZ ratio = $\left[\frac{ABC}{XYZ}\right]$

Q-1A

Total Assets = ₹ 2500,000

[50%] 8% Borrowing ⇓ 1250,000

[Balancing] Equity ⇓ 1250,000

Sale value = 480,000 × 150%
= 720,000

Income Statement:

	(₹)
Sales	720,000
Less: Direct expenses	480,000
Less: Other operating exp.	80,000
EBIT	160,000
Less: Interest on Borr. (1250,000 × 8%)	100,000
EBT	60,000
Less: Tax @ 50%	30,000
EAT / EAE	30,000

Requirement:

(i) **Net profit margin**

$$= \left(\frac{\text{Net profit}}{\text{Sales}} \times 100\right) = \frac{30.000}{720.000} \times 100$$

$$= \boxed{4.16\%} \text{ Ans}$$

(ii) **Return on Assets (ROA)**

$$\text{ROA (pre-tax)} = \left(\frac{\text{EBIT}}{\text{Total Assets}} \times 100\right)$$

$$= \left(\frac{160.000}{2500.000} \times 100\right)$$

$$= \boxed{6.4\%} \text{ Ans}$$

$$\text{ROA (past tax)} = \left(\frac{\text{EBIT} \times (1-T)}{\text{Total Assets}} \times 100\right)$$

$$= \frac{160.000 \times (1-.50)}{2500.000} \times 100$$

$$= \boxed{3.2\%} \text{ Ans}$$

(iii) **Assets Turnover ratio**

$$= \frac{\text{Sales}}{\text{Total Assets}} = \frac{720.000}{2500.000} = \boxed{.29} \text{ Ans}$$

(iv) $$\text{ROE} = \frac{\text{EAE}}{\text{Equity}} \times 100 = \frac{30.000}{1250.000} \times 100$$

$$= \boxed{2.4\%} \text{ Ans.}$$

Q-1B

Opening stock	90,000
Add: Purchase	270,000
Less: closing stock	110,000
material consumed.	250,000

$$\text{Average inventory} = \frac{90,000 + 110,000}{2}$$

$$= 100,000$$

Requirement:

(i) Inventory turnover ratio

$$= \frac{\text{material consumed}}{\text{Average inventory}} = \frac{250,000}{100,000}$$

$$= \boxed{2.5 \text{ times}} \quad \text{Ans}$$

(ii) Inventory holding period:

$$= \left[\frac{365 \text{ days}}{\text{Inventory turnover ratio}}\right]$$

$$= \frac{365}{2.5} = \boxed{146 \text{ days}} \quad \text{Ans.}$$

Q-15

Credit sale (Assume) = x

Cash Sale = 25% of x = $x \times .25 = .25x$

Total Sales = 3000.000

$\therefore x + .25x = 3000.000$

$\therefore x = \frac{30.00.000}{1.25} = 2400.000$

Hence, Cash sale = 2400.000

Requirement:

(i) Average inventory:

Cons ratio = 100% − 25% = 75%

$\because$ [Cons + GP = Sale]

Cons = 300.0000 × 75% = 2250.000

Inventory Turnover ratio = $\frac{\text{Cons}}{\text{Average invent.}}$

or, $6 = \frac{2250.000}{\text{Average inventory}}$

$\therefore$ Avg. Inventory = $\frac{2250.000}{6} = \boxed{375000}$

Ans.

(ii) Purchase:

Opening Stock = x

Closing Stock = x + 80,000

Average = $\frac{x + (x + 80,000)}{2}$

or 375000 = $\frac{2x + 80,000}{2}$

or 2x = 750,000 − 80,000 = 670,000

∴ x = $\frac{670,000}{2}$ = 335000

Again, we know

Cons = opening stock + purchase − closing stock

or, 2250,000 = 335000 + P − (335000 + 80,000)

or. P = 2250,000 − 335000 + 415000

∴ Purchase = **2330,000** Ans

(iii) Average receivables:

Receivable Turnover ratio = $\frac{\text{Credit sale}}{\text{Average Receivable}}$

or, 8 = $\frac{2400,000}{AR}$ ∴ AR = **300,000** Ans.

(iv) Average payables (AP)

Credit purchase = 330,000 − 230,000
= 100,000

P. Turnover ratio = $\frac{\text{credit purchase}}{\text{Average payables}}$

or, 10 = $\frac{100,000}{AP}$

∴ AP = 10,000 Ans

(v) Average payment period:

= $\frac{365 \text{ days}}{\text{payable TOR}}$ = $\frac{365 \text{ days}}{10}$

= 36.5 days Ans.

(vi) Average collection period

= $\frac{365 \text{ days}}{8}$ = 45.6 days Ans.

(vii) current Assets:

Current ratio = 2.4

∴ $\frac{CA}{CL}$ = 2.4 ∴ CA = 2.4 CL

Again.

working capital = 280,000

or, CA − CL = 280,000

or, 2.4CL − CL = 280,000

∴ CL = $\frac{280,000}{1.4}$ = 200,000

Hence, CA = 2.4 CL = 2.4 × 200.000
= 480.000 Ans

(viii) Current Liabilities = 200.000 Ans
(Calculated above).

Q-12

$$\text{working capital TOR} = \frac{\text{Sales}}{\text{working capital}}$$

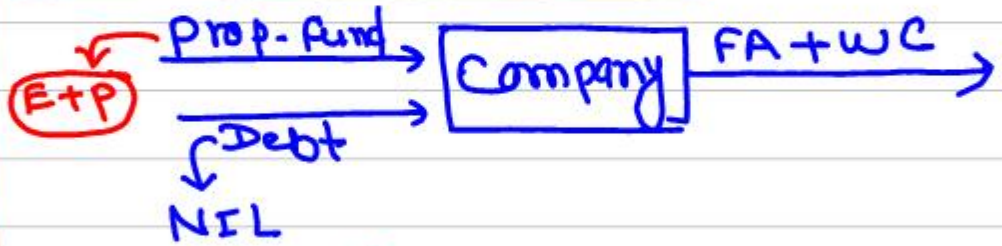
$$\text{or, } 5 = \frac{\text{Sales}}{1200.000}$$

$$\therefore \text{Sales} = 6000.000$$

Requirement:

(i) **proprietor's fund:**

Interpretation (Not exam)



$\therefore$ prop. fund = FA+WC

FA to proprietory fund ratio = 0.75

$$\text{or, } \frac{FA}{PF} = 0.75 \quad \therefore FA = 0.75PF$$

Again,

$$PF = FA + \text{working cap.}$$

$$\text{or, } PF = 0.75PF + 1200.000$$

$$\text{or, } 0.25PF = 1200.000$$

$$\therefore PF = \left[\frac{1200.000}{0.25}\right] = \boxed{4800.000} \text{ Ans}$$

(ii) Fixed Assets:

$= 0.75 \times pf$

$= 0.75 \times 4800.000 = \boxed{3600.000}$

Ans

(iii) Net profit ratio:

Net profit = 4800.000 x 15% = 720.000

Alternatively,

$$ROE = \left[\frac{\text{Net profit (EAT)}}{\text{Shareholders' Equity or, propertory fund}}\right]$$

$$\text{or, } .15 = \frac{EAT}{4800.000}$$

$$\therefore EAT = 4800,000 \times .15 = 720.000$$

$$\text{Net profit ratio} = \frac{720.000}{\text{sale}} \times 100$$

$$= \left(\frac{720.000}{6000,000} \times 100\right)$$

$$= \boxed{12\%}$$ Ans

Q-1E

(i) working capital = 1350,000

or. CA − CL = 1350,000

[Where, $\frac{CA}{CL} = \frac{2.5}{1}$ ∴ CA = 2.5 CL]

or, 2.5CL − CL = 1350,000

∴ $CL = \frac{1350,000}{1.5} = 900,000$

Hence, CA = 2.5 × 900,000 = **2250,000**

(ii) Total Assets = CA + FA

= 2250,000 + 3000,000

= 5250,000

(iii) Total Assets turnover ratio

$= \frac{\text{Sale}}{\text{T. Assets}}$

or, $2 = \frac{\text{sale}}{5250,000}$

∴ Sale = 10500,000

(iv) Gross profit = 20% of sale

= 10500,000 × 20% = 2100,000

(v) COGS = 80% of sale
= 80% of 10500,000 = 8400,000

(vi) Stock Turnover ratio = $\frac{\text{COGS}}{\text{Average stock}}$

or, $7 = \frac{8400,000}{\text{Average stock}}$

∴ Average stock = $\frac{8400,000}{7}$ = 1200,000

(vii) Average stock = $\frac{\text{opening} + \text{closing}}{2}$

or, $1200,000 = \frac{1140,000 + \text{closing}}{2}$

∴ closing stock = 1260,000

Requirement:

(a) Quick ratio:

Quick Assets = CA - Stock (closing)
= 2250,000 - 1260,000
= 990,000

∴ Quick Ratio = $\frac{QA}{CL} = \frac{990,000}{900,000}$

= **1.1** Ans

(b) Fixed Assets turnover ratio

$$= \frac{\text{Sales}}{\text{Fixed Assets}} = \frac{10500,000}{30,00,000}$$

$$= \boxed{3.5} \text{ Ans}$$

(c) proprietary ratio:

Capital employed = FA + WC

= 30,00,000 + 1350,000

= 4350,000

∴ proprietary fund + Debt = 4350,000. — (i)

Again,

$$\frac{\text{Debt}}{\text{Share holders' Equity (proprietary fund)}} = \frac{1}{1.5}$$

∴ PF = 1.5 Debt

From (i) above,

1.5 Debt + Debt = 4350,000

∴ Debt = $\frac{4350,000}{2.5}$ = 1740,000

∴ PF = 1.5 x 1740,000 = 2610,000

$$\text{Proprietary fund ratio} = \frac{\text{Proprietary Fund}}{\text{Total Assets}}$$

$$= \frac{2610,000}{5250,000} = \boxed{0.497} \text{ Ans.}$$

Disclaimer:

ICAI used:

Total Assets = (proprietary fund + Debt) which is not correct.

It means:

Total Assets = (PF + Debt) + Current Liab

Not for exam.

Not used EBIT x (1-T) because there is no information regarding interest and tax.

(d) Earning per share:

$$\text{ROTA} = \frac{\text{Net profit}}{\text{TA}}$$

$$\text{or, } .15 = \frac{\text{Net profit}}{5250,000}$$

$\therefore$ Net profit = 787500

$\therefore$ EAE = 787500 − pref div

= 787500 − (60,000 x 10) x 9%

= 787500 − 54000 = 7,33,500

$\therefore$ Eps = $\frac{733500}{180,000}$ = $\boxed{4.075}$ Ans.

Q-1F

(a) Gross profit ratio = 25% of sale

$\therefore 400{,}000 = \text{Sale} \times .25$

$\therefore \text{Sale} = \frac{400{,}000}{.25} = 1600{,}000$

(b) Cost = 1600,000 − 400,000 = 1200,000

(c) Fixed Assets TOR = $\frac{\text{Sale}}{\text{FA}}$

or, $4 = \frac{1600{,}000}{\text{FA}}$

$\therefore \text{FA} = 400{,}000$

Requirement:

(i) Sales & Cost:

Sales = 1600,000 Ans

Cost = 1200,000 Ans

(calculated Above)

(ii) Sundry debtors:

Debtor velocity = $\frac{\text{T. debtor}}{\text{Credit sale}} \times 12$ months

or, $3 = \frac{\text{T. Debtor}}{160{,}000} \times 12$

$\therefore$ T. debtor = 400,000

Sundry debtor = Total debtor - Bills receivable
= 400,000 - 25,000
= 375,000 Ans

Note: Assumed, Total sales are credit sales.

(iii) Sundry creditors:

Stock turnover ratio = 1.5

or, $\frac{\text{Cost}}{\text{Average stock}} = 1.5$

or, $\frac{1200,000}{\text{Average stock}} = 1.5$

$\therefore$ Average stock = $\frac{1200,000}{1.5} = 800,000$

Assume opening stock = x
closing stock = x + 10,000
Average stock = $\frac{x + (x + 10,000)}{2}$

or, $800,000 = \frac{2x + 10,000}{2}$

$\therefore x = \frac{1600,000 - 10,000}{2} = 795000$

Hence opening S = 795000
closing S = 805000

Opning + purchase − closing = cons

or, 795000 + P − 805000 = 1200,000

∴ P = 1200,000 + 805000 − 795000

= 1210,000

$$\text{credit velocity} = \frac{\text{T. creditors}}{\text{credit purchase}} \times 12\text{m}$$

$$\text{or, } 2 = \frac{\text{T. creditor}}{1210,000} \times 12$$

$$\text{or T. Creditor} = \frac{1210,000 \times 2}{12} = 201,667$$

Hence, Sundry creditor = 201667 − 10,000

= 191667 Ans

(iv) closing stock = 805000 Ans
(Calculated above)

(v) Fixed Assets = 400,000 Ans.
(Calculated above)

Q-15

(i) GP ratio $= \frac{G.P.}{Sale} \times 100 = \left(\frac{4218000}{19656000} \times 100\right)$

$= 21.46\%$

(ii) Net profit ratio $= \frac{1408600}{19656000} \times 100$

$= \boxed{7.17\%}$ Ans

(iii) Operating cost ratio.

Cons = Sales - GP

$= 19656000 - 4218000$

$= 15438000$

Operating expenses = Admin + selling

$= 1840000 + 756000$

$= 2596000$

Operating cost $= 15438000 + 2596000$

$= 18034000$

Operating cost ratio $= \frac{18034000}{19656000} \times 100$

$= \boxed{91.75\%}$ Ans

(iv) Operating profit ratio:

Operating profit = Sale - Operating cost
= 19656000 - 18034000
= 1622000

Operating profit ratio = $\left(\frac{1622000}{19656000} \times 100\right)$

= **8.25%** Ans

Alternatively.

Operating profit ratio = 100% - Operating cost ratio

= (100% - 91.75%) = **8.25%** Ans

(V) Inventory turnover ratio

$$= \frac{\text{Cost}}{\text{Average inventory}}$$

$$= \left[\frac{15438000}{\frac{(1246000 + 1428000)}{2}}\right]$$

$$= \left[\frac{15438000}{1337000}\right]$$

= **11.55** Ans.

(vi) Current ratio:

Current Assets = 1350.000 + 1428000 + 422000 = 3200.000

current liab = 720.000 + 280.000 = 10.00.000

current ratio = $\frac{3200.000}{10.00.000}$ = 3.2 Ans.

(vii) Quick ratio:

Quick Assets = 3200.000 − Stock = 3200.000 − 1428000 = 1772000

Quick ratio = $\frac{1772000}{10,00,000}$ = 1.772 Ans

(viii) Interest coverage ratio:

= $\frac{EBIT}{Interest}$ = $\frac{(EBT + Interest)}{Interest}$

= $\frac{(1408600 + 260.000)}{260,000}$ = 6.42 Ans.

(ix) Return on capital employed:

Capital employed = 20.00.000 + 4200.000
+ 1200.000 + 2600.000
= 100.00.000

$$ROCE = \left(\frac{EBIT}{\text{capital employed}} \times 100\right)$$

$$= \left(\frac{1408600 + 260.000}{100.00.000}\right) \times 100$$

$$= \boxed{16.68\%} \text{ Ans.}$$

(X) Debt to Assets ratio:

$$= \frac{\text{Debt}}{\text{Total Assets}} = \left[\frac{2800.000}{110.00.000}\right]$$

$$= \boxed{0.2363} \text{ Ans.}$$

Q-1H

Return: 10% + 10% × 20% = 12%
10% + 20% = 30%

Interpretation (Not for exam)

$$ROI = \left(\frac{\text{Earning/profit}}{\text{Investment}} \times 100\right)$$

$$= \left(\frac{\text{profit}}{\text{sale}} \times \frac{\text{sale}}{\text{Investment}}\right)$$

↳ If it is Asset.

$$ROI = (\text{profit margin} \times \text{Assets TOR})$$

(a) ROI = profit margin × Assets Turnover ratio
= 25% × 3 = **75%** Ans

(i) **New ROI:**

New profit margin = 25% + 5% = 30%

Note: Alternatively, we may increase Net profit by 5% of 25.
In this case New profit margin
= 25% + (25 × 5%)
= **26.25%**

Recommendation: If % increase is low then add absolute value. (i.e. 25% + 5%) = 30%

New ROI = 30% x 3 times = 90%

(ii) New ROI = 25% x 2 times = 50%.

(iii) New ROI = 20% x 4 times

= 80% Ans.

Q-11

(i) Gross profit ratio:

	2016	2017
Gp. ratio ($\frac{GP}{Sale} \times 100$)	$\frac{64000}{300,000} \times 100$ = 21.3%	$\frac{76000}{374000} \times 100$ = 20.32%

(ii) Operating expense ratio

	2016	2017
Operating exp.	13000 + 6000 + 19000 + 11000 = 49000	14000 + 10,000 + 19000 + 14000 = 57000
Operating exp. ratio ($\frac{\text{operating exp}}{\text{Sale}} \times 100$)	$\left(\frac{49000}{300000} \times 100\right)$ = 16.3%	$\left(\frac{57000}{374000} \times 100\right)$ = 15.24%

(iii) Operating profit ratio

	2016	2017
Operating profit EBIT = (PBT + Int)	15000 + 0 = 15000	17000 + 2000 = 19000

Operating profit ratio = (Operating profit / Sale x100)	(15000 / 300.000 x100) = 5%	(19000 / 374000 x100) = 5.08%.

(iv) Capital turnover ratio

	2016	2017
Capital TOR = [Sale / Capital]	300.000 / 100.000 = 3 Ans	374000 / 147000 = 2.54 Ans

(v) Stock turnover ratio

	2016	2017
Average stock	(40.000+60.000)/2 = 50,000	(60.000+94000)/2 = 77000
Stock turnover ratio = [Cost / Average Stock]	(236000/50000) = 4.72	(298000/77000) = 3.87

(Vi) Net profit to Net worth ratio

	2016	2017
Net profit to Net worth ratio $= \left(\frac{NP}{\text{Net worth}} \times 100\right)$	$\frac{15000}{100,000} \times 100$ $= 15\%$	$\frac{17000}{(75000+42000)} \times 100$ $= 14.52\%$

(Vii) Receivable collection period

	2016	2017
Collection period $= \left(\frac{\text{Receivable}}{\text{Credit sale}} \times 365\right)$	$\frac{50,000}{270,000} \times 365$ $= 67.6$ days	$\frac{82000}{342000} \times 365$ $= 87.5$ days.

Q-15

XYZ company's details are as under

Revenue = ₹29261

Net income = ₹4212

Assets = ₹27987

Shareholders' Equity = ₹13572

Calculate Return on Equity as per du pont model.

Solution:

(i) Net profit ratio = $\frac{\text{Net profit}}{\text{Sale}} \times 100$

$= \frac{4212}{29261} \times 100 = 14.40\%$

(ii) Assets turn over ratio = $\frac{\text{Sales}}{\text{Assets}}$

$= \frac{29261}{27987} = 1.045$ times.

(iii) Equity multiplier = $\left[\frac{\text{Assets}}{\text{Shareholders' Equity}}\right]$

$= \frac{27987}{13572} = 2.06$ times.

(iv) ROE = Net profit ratio × Assets turnover × Eq. multiplier

$= 14.40\% \times 1.045 \times 2.06 = \boxed{30.90\%}$ Ans

Q-2A

Summarised Balance sheet as on 31.3.02

Liabilities	(₹)	Assets	(₹)
Equity cap (960,000 - 160,000)	800,000	Fixed Assets	720,000
Reserve & surplus	160,000		
		Current Assets:	
Current Liab		Stock	160,000
Bank OD	40,000	Other current Assets (400000 - 160,000)	240,000
Other current liab (160,000 - 40,000)	120,000		
	1120,000		1120,000

Working Notes:

(i) working capital = CA - CL = 240,000

Again. $\frac{CA}{CL} = 2.5$ (i.e. current ratio)

$\therefore CA = 2.5CL$

From above,

$2.5CL - CL = 240,000$

$\therefore CL = \frac{240,000}{1.5} = 160,000$

Hence, $CA = 2.5 \times 160,000 = 400,000$

(ii) Quick ratio = $\frac{\text{Quick Assets}}{\text{Current Liab}}$

or, $1.5 = \frac{\text{CA - stock}}{160,000}$

or $1.5 = \frac{400,000 - \text{stock}}{160,000}$

or, $240,000 = 400,000 - \text{stock}$

$\therefore$ stock $= 400,000 - 240,000 = \boxed{160,000}$

(iii) $\frac{\text{Fixed Assets}}{\text{proprietary fund}} = 0.75$ — @

we also know,

proprietary fund = Fixed Assets + WC

or, PF = FA + 240,000

From @ above

$\frac{FA}{FA + 240,000} = 0.75$

$FA = 0.75FA + 180,000$

$\therefore FA = \frac{180,000}{.25} = 720,000$

Hence, proprietary Fund = 720,000 + 240,000

= 960,000

Q-2B

(a) Calculation of operating expenses:

Net profit (After tax) = 6.25% of sale

= 60,00,000 × 6.25%

= 375000

Profit before tax × (1-T) = PAT

$PBT = \frac{375000}{(1-.50)} = 750,000$

PBIT = PBT + Interest

= 750,000 + 60,000 = 810,000

Total operating cost = sale − EBIT

= 60,00,000 − 810,000

= 5190,000

∴ Operating expenses

= operating cost − cons

= 5190,000 − 1800,000

= 3390,000 Ans

(b) Balance sheet as on 31.3.2010

Liabilities	(₹)	Assets	(₹)
Share cap.	1050,000	Fixed Assets (Bal. fig)	1700,000
Reserve & surp.	450,000	Current Assets	
15% Debenture (60,000/.15)	400,000	Stock	150,000
		Receivables	200,000
payables.	200,000	Cash	50,000
	2100,000		2100,000

Working Note:

(i) Return on Networth = .25

or, $\frac{\text{Net profit after tax}}{\text{Net worth}} = .25$

or, $\frac{375000}{\text{Net worth}} = .25$

∴ Net worth = 15,00,000

Second alternative:

25% value ⇒ 375000

100% value (Net worth) ⇒ $\frac{375000}{25\%} = 1500,000$

(ii) Net worth = Share capital + Reserve

or, 1500.000 = SC + R

From given ratio:

$$\frac{SC}{Reserve} = \frac{7}{3}$$

or, 3SC = 7 Reserve

$$\therefore SC = \frac{7\,Reserve}{3}$$

From above,

$$1500.000 = \frac{7R}{3} + R$$

$$\therefore 1500.000 = \frac{7R+3R}{3}$$

or 10R = 4500.000 $\therefore R = 450.000$

Hence, Share capital = 1500.000 − 450.000

= 1050.000

Second alternative:

1500.000 → Share capital [7]

→ Reserve [3]

Apportion 1500.000 in 7:3 ratio.

Share capital = $\frac{1500.000}{10} \times 7 = 1050.000$

Reserve = $\frac{1500.000}{10} \times 3 = 450.000$

(iii) current ratio = $\frac{CA}{CL}$

or, $2 = \frac{CA}{200.000}$

$\because$ CL = payable

$\therefore$ CA = 400.000

(iv) Stock turnover ratio = $\frac{Cost}{Stock}$

or $12 = \frac{1800.000}{Stock}$

$\therefore$ Stock = 150.000

(v) Cash = 400.000 − 200.000 − 150,000
(CA) (Receivable) (Stock)

= 50.000

Q-2C

Balance sheet

Assets	(₹)	Liabilities.	(₹)
Cash	50,000	Notes & payables	100,000
Account Rec.	50,000	Long-T debt	100,000
Inventory	100,000	Common stock (Equity)	100,000
Plant & M. (Bal. fig)	200,000	Retained Earning	100,000
	400,000		400000

Working note:

(i) $\frac{\text{Long term debt}}{\text{Networth}} = \frac{0.50}{1}$

or, $\frac{LTD}{200,000} = \frac{0.50}{1}$

$\therefore LTD = 100,000$

(ii) $\frac{\text{Sales}}{\text{Total Assets}} = 2.5$

or, Sales $= 2.5 \times 400,000 = 10,00,000$

(iii) Gross profit = 10% of sale
= 10,00,000 × 10%
= 1,00,000

(iv) Cost = 10,00,000 − 1,00,000 = 9,00,000

(v) Inventory TOR = $\frac{\text{Cost}}{\text{Inventory}}$

or, 9 = $\frac{9,00,000}{\text{Inventory}}$

∴ Inventory = 1,00,000

(vi) Collection period = $\frac{\text{Receivable}}{\text{Credit sale}} \times 360$ days

or, 18 = $\frac{\text{Receivable}}{10,00,000} \times 360$

∴ Receivable = $\frac{1,80,00,000}{360}$ = 50,000

(vii) Acid test ratio = $\frac{\text{Quick Assets}}{\text{Current liab.}}$

or, 1 = $\frac{QA}{1,00,000}$

∴ QA = 1,00,000

(viii) CA − Inventory = QA = 1,00,000

or, CA − 1,00,000 = 1,00,000

∴ CA = 2,00,000

(ix) cash = CA - Inventory - Receivable

= 200.000 - 100.000 - 50.000

= 50.000

Q-2 D

Balance sheet of a company

Liabilities	(₹)	Assets	(₹)
Equity cap.	2016000	Fixed Assets	2800.000
Reserve	504000		
preference cap. (Bal. fig)	1080.000	Current Assets:	
		T. Receivables	700.000
long T. debt	0	Stocks	600.000
		other current Assets (1600.000 − 700.000 − 600.000)	300.000
Current liab.	800.000		
	4400.000		4400.000

Working note:

(i) $\frac{CA}{CL} = 2 \quad \therefore \quad CA = 2CL$

Again. working capital = 800.000

or, $CA - CL = 800.000$

or, $2CL - CL = 800.000$

$\therefore CL = \frac{800.000}{1} = 800,000$

Hence, $CA = 2 \times 800.000 = 1600.000$

(ii) Quick ratio = 1.25
(Liquidity ratio)

$$\text{or, } \frac{CA - \text{stock}}{CL} = 1.25$$

$$\text{or. } \frac{1600.000 - \text{stock}}{800.000} = 1.25$$

$$\text{or, } -\text{stock} = (1.25 \times 800.000) - 1600.000$$

$$\therefore \text{ stock} = 600.000$$

(iii) Stock TOR = 7

$$\text{or. } \frac{\text{Cons}}{\text{Stock}} = 7$$

$$\text{or, Cons} = 7 \times 600.000 = 4200.000$$

(iv) Cons ratio = 100% - Gp ratio
= 100% - 25% = 75%

75% value = 4200.000

100% value (sale) = $\left(\frac{4200.000}{75\%}\right)$ = 5600.000

(v) Gross profit = 25% of 5600.000
= 1400.000

(vi) Collection ratio = $\frac{\text{Receivable}}{\text{Credit sale}} \times 12\text{m}$

$$\text{or, } 1.5 = \frac{\text{Rec}}{5600.000} \times 12$$

or, Receivable = $\frac{5600.000 \times 1.5}{12}$ = 700.000

(vii) $\frac{\text{Sale}}{\text{FA}} = 2$

or. $\frac{5600.000}{\text{FA}} = 2$

∴ FA = 2800.000

(viii) $\frac{\text{Net worth}}{\text{FA}} = 0.9$ times.

or, $\frac{\text{Networth}}{2800.000} = 0.9$

∴ Networth = 2520.000

(ix) Net worth = Equity capital + Reserve

Given, $\frac{RS}{\text{Equity capital}} = 0.25$

Assumed, capital is Equity cap.

∴ RS = 0.25 Equity capital

or, 2520.000 = Equity capital + .25 Eq. cap

∴ Equity capital = $\left[\frac{2520.000}{1.25}\right]$

= 2016000

∴ Reserve = 2016000 × .25 = 504000

Disclaimer! ICAI ignored Networth to FA ratio and considered balancing figure as capital.

Seeond Alternative:

Capital / capital employed = 4400.000
- 800.000
= 3600.000

Given, $\frac{\text{Reserve}}{\text{Capital}} = .25$

or, $\frac{\text{Reserve}}{3600.000} = .25$

∴ Reserve = **900.000**

Equity capital = Net worth - Reserve
= 2520,000 - 900,000
= **1620,000**

preference capital = 3600.000 - 1620.000
- 900.000
= **1080.000**

Q-2E

Balance sheet of moon Limited

Liabilities	(₹)	Assets.	(₹)
Net worth	900.000	Fixed Assets	850.000
		Stock	50.000
Current liab. (Bal. fig)	100.000	Debtor	40.000
		Cash (150.000 − 50.000 − 40.000)	60.000
	10.00.000		10,00,000

Working Note:

(i) $\text{Sale} = \frac{60.000}{20\%} = 300.000$

(ii) $\text{Assets turnover ratio} = \frac{\text{Sale}}{\text{Total Assets}}$

or, $\frac{0.30}{1} = \frac{300.000}{\text{Total Assets}}$

$\therefore$ Total Assets = 10,00.000

(iii) $\frac{\text{Net worth}}{\text{Total Assets}} = \frac{0.90}{1}$

or, Net worth = $0.90 \times 1000.000 = 900.000$

(iv) Current ratio = $\frac{1.5}{1}$.

$\frac{\text{Current Assets}}{\text{Current liab}} = \frac{1.5}{1}$ → Balancing fig in BIS.

Or, CA = 1.5 × 100.000 = 150.000

(v) Fixed Assets = Total Assets − Current Assets

= 10,00.000 − 150.000 = 850.000

(vi) $\frac{\text{liquity Assets}}{\text{current liab}} = \frac{1}{1}$

Or, $\frac{\text{CA} - \text{stock}}{\text{100000}} = 1$

Or, 150.000 − stock = 100.000

∴ Stock = 50.000

(vii) $\frac{\text{Credit sale}}{\text{Total sale}} = 0.80$

Credit sale = 300,000 × .80 = 240,000

(viii) Collection period = $\frac{\text{Debtor}}{\text{Credit sale}} \times 360 \text{ days}$

Or, 60 = $\frac{\text{Debtor}}{240,000} \times 360$

∴ Debtor = $\frac{60 \times 240.000}{360}$ = 40,000

Q-2F

(i) Non current Assets as on 31.3.2018
= 5000,000 (same as opening)

(ii) $\frac{\text{Non current Assets}}{\text{Sales}} = \frac{1}{4}$

or, $\frac{5000.000}{\text{Sales}} = \frac{1}{4}$

∴ Sales = 200.00.000

(iii) $\frac{\text{Non C.A}}{\text{current Assets}} = \frac{1}{2}$

or, $\frac{5000.000}{CA} = \frac{1}{2}$

∴ CA = 100.00.000

(iv) Gross profit = 20% of 200.00.000
= 40.00.000

(v) Net profit = 10% of 200.00.000
= 20.00.000

(vi) Cons = Sale - GP
= 200.00.000 - 40.00.000
= 160.00.000

(vii) Inventory holding period = $\frac{\text{Inventory}}{\text{COGS}} \times$

or, $3 = \frac{\text{Inventory}}{160,00,000} \times 12$

$\therefore$ Inventory $= \frac{3 \times 160,00,000}{12} = 40,00,000$ (12m)

(viii) Receivable collection period

$= \frac{\text{Receivable}}{\text{credit sale}} \times 12m$

or, $3 = \frac{\text{Receivable}}{200,00,000} \times 12$

$\therefore$ Receivable $= \left(\frac{3 \times 200,00,000}{12}\right) = 5000,000$

Requirement:

(a) COGS = 160,00,000 Ans
[Calculated in (vi) above]

(b) Net profit = 20,00,000 Ans
[Calculated in (v) above]

(c) Inventory = 40,00,000 Ans
[Calculated in (vii) above]

(d) Receivables = 5000,000 Ans
[Calculated in viii above]

(f) Cash for the year ended 31.3.2018.

Current Assets = 100.00.000

Cash for the year

= Current Assets - Receivable - Inventory

= 100.00.000 - 50.00.000 - 40.00.000

= 10.00.000 Ans.

Q-24 Working Note:

(i) GP = 25% of 3000,000 = 750,000

(ii) COGS = 30,00,000 − 750,000 = 2250,000

(iii) $\frac{COGS}{FA} = 1.5$

or, $\frac{2250,000}{FA} = 1.5$

∴ $FA = \frac{2250,000}{1.5} = 1500,000$

(iv) $\frac{COGS}{Stocks} = 6$

or, $\frac{2250,000}{Stocks} = 6$ ∴ Stocks = 375,000

(v) Receivable collection period = $\frac{Debtor}{credit\ sale} \times 12m$

or, $2 = \frac{Debtor}{30,00,000} \times 12$

∴ $Debtor = \frac{2 \times 30,00,000}{12} = 500,000$

(vi) $\frac{FA}{Net\ worth} = \frac{1.20}{1}$

or, $\frac{1500,000}{Net\ worth} = \frac{1.20}{1}$

∴ Net worth = 1250,000

(vii) $\frac{CA}{CL} = 1.5$

$\therefore CA = 1.5\,CL$

Again,

Quick ratio = 1

or, $\frac{CA - Stock}{CL} = 1$

or, $\frac{1.5CL - 375000}{CL} = 1$

or, $1.5CL - 375000 = CL$

$\therefore CL = \frac{375000}{.50} = 750,000$

Hence, $CA = 1.5 \times 750,000 = 1125000$

Requirement:

(a) Closing Stock = 375000 Ans
[See (iv) above]

(b) Fixed Assets = 1500,000 Ans
[See (iii) above]

(c) Current Assets = 1125000 Ans
[See (vii) above]

(d) Debtor = 500,000 Ans [See (v) above]

(e) Net worth = 1250,000 Ans [See (vi) above]

For CMA requirement:

Balance sheet of Q Ltd

	(₹)		(₹)
Equity cap.	781250	Fixed Assets	1500.000
Reserve	468750	Current Assets:	
		Stocks	375000
long T. Debt	625,000	Debtor	500.000
current liab	750.000	Cash & Bank (1125000 - 375000 - 500.000)	250.000
	2625000		2625000

→ Capital employed = 26,25,000 - 750.000
= 18,75,000

→ Capital gearing ratio = $\frac{\text{Debt}}{\text{Equity (i.e. Net worth)}}$

Or, 0.50 = $\frac{\text{Debt}}{1250,000}$

∴ Debt = 6,25,000

→ $\frac{\text{Reserve}}{\text{Equity capital}}$ = 0.60

∴ Reserve = 0.60 EC

Again Reserve + EC = 1250.000

$0.60 EC + EC = 1250.000$

$\therefore EC = 7,81,250$

Hence Reserve = $781250 \times .60$

$= 468750$

Q-3A

Trading & profit & loss A/c

	(₹)		(₹)
To cons	204000	By sale	240,000
To G.P. c/d	36000		
	240,000		240,000
		By G.P b/d	36000
To Interest	1000		
To Admin & Selling exp. (bal. fig)	22000		
To Net profit	13000		
	36000		36000

Balance sheet as at 31.3.2017

	(₹)		(₹)
Share capital	100,000	Land & Building	80,000
Other share holder fund	30,000	Plant & machinery	
		Opening : 35000	
5% Debenture	20,000	purchase : 10,000	
		45000	
Trade creditors	50,000	less: Dep 5000	40,000
		Inventory	30,000
		Receivables	40,000
		Bank / other CA (80,000 - 30,000 - 40000)	10,000
	200,000		200,000

Working:

(i) Share capital = 100,000

Again. Share capital is 50% of total liab.

i.e. (Total liab × 50%) = 100,000

∴ Total liab = $\frac{100,000}{.50}$ = 200000

It means:

Share capital	100,000
Other shareholders fund (200000 × 15%)	30,000

5% Debentures (200.000 x 10%)	20.000
Trade creditors (200000 x 25%)	50.000
	200.000

(ii) Interest = (20.000 x 5%) = 1000

(iii) Total Fixed & current Assets = 200.000

Fixed Assets = [200000 x 60%]	120.000
less: Land & Building	80.000
plant & machinery	40.000

Opening + purchase - Depreciation = closing

$35000 + x - 5000 = 40.000$

$\therefore x = [40.000 + 5000 - 35000]$

$= 10,000$

$\therefore$ purchase of plant = 10,000

(iv) $\frac{CA}{CL} = \frac{8}{5}$ $\because$ CL = Trade creditors.

or $\frac{CA}{50.000} = \frac{8}{5}$

$\therefore CA = \frac{(50.000 \times 8)}{5} = 80.000$

(v) Quick ratio = $\frac{1}{1}$

or $\frac{QA}{CL} = \frac{1}{1}$

or, $\frac{CA - Inventory}{50,000} = 1$

or, $80,000 - Inventory = 50,000$

$\therefore$ Inventory = 30,000

(vi) Receivables = $[80,000 - 30,000] \times \frac{4}{5}$

= 40,000

(vii) $\frac{Receivable}{Sale} \times 12m = 2 \text{ months}$

or, $\frac{40,000}{Sale} = \frac{2}{12}$

$\therefore$ Sale = $\left[\frac{40,000 \times 12}{2}\right] = 240,000$

(viii) Return on Net worth = .10

or, $\frac{Net\ profit}{Net\ worth} = .10$

or $\frac{Net\ profit}{130,000} = .10$

$\therefore$ Net profit = 13000

(ix) GP = (240,000 × 15%) = 36000

(x) Cons = (Sale − GP)

= (240,000 − 36000) = 204000

(xi) Stock TOR = $\frac{\text{Cons or Sale}}{\text{Stock}}$

or. 8 = $\frac{204000}{\text{Stock}}$ or $\frac{240.000}{\text{Stock.}}$

∴ Stock = 25500 ∴ Stock = 30,000

⇓

Ignore it as already calculated 30.000.

Q-3 B

Profit & Loss A/c

	(₹)		(₹)
To Rm consumed	1326000	By sales	7800,000
To Direct wages	663000		
To other work cost (bal.fg)	4641000		
To G.P.	1170,000		
			7800,000
To Admin & Selling exp.	546000	By G.P.	1170,000
To Net profit	624000		
			1170,000

Balance sheet as on 31. Dec. 2006

	(₹)		(₹)
Share cap.	300,000	Fixed Assets	2600.000
Reserve	1200.000		
Long T. Loan	2200.000	Stock of R.M	331500
Current liab	1100.000	Stock of F.G.	397800
		Receivables	1300,000
		Other current Assets [2200.000 - above]	170,700
	4800.000		4800.000

Working capital:

(i) As question is silent, assume opening and closing value of fixed Assets is same. (i.e. 26,00,000)

(ii) $\frac{\text{Fixed Assets}}{\text{Sale}} = \frac{1}{3}$

or $\frac{2600.000}{\text{Sale}} = \frac{1}{3}$

$\therefore$ Sale = (2600.000 × 3) = 7800.000

(iii) $\frac{\text{Fixed Assets}}{\text{Current Assets}} = \frac{13}{11}$

or $\frac{2600,000}{CA} = \frac{13}{11}$

$\therefore CA = \left[\frac{2600,000 \times 11}{13}\right] = 2200,000$

(iv) $\frac{CA}{CL} = \frac{2}{1}$

or $\frac{2200.000}{CL} = 2$

$\therefore CL = \left[\frac{2200,000}{2}\right] = 1100.000$

(v) $\frac{\text{Long T. Loan}}{CL} = \frac{2}{1}$

or, Long T. Loan $= (1100,000 \times 2)$
$= 2200.000$

(vi) GP $= (7800.000 \times 15\%) = 1170,000$

(vii) N.P. $= (7800000 \times 8\%) = 624,000$

(viii) Raw mat consumed = 20% of work cost

Here,
work cost = Sale − GP.
"Cons"
$= 7800,000 - 1170,000$
$= 6630.000$

or, RM Consumed
$= (6630.000 \times 20\%) = 1326000$

(ix) Direct wage = (6630,000 × 10%)
= 663000

(x) Stock of Rm:

1 m usage = 1326000

3 m usage = $\left(\frac{1326000}{12} \times 3\right)$

= 331,500

(xi) stock of Fin = (6630,000 × 6%)
= 397800

(xii) $\frac{\text{Receivable}}{\text{Credit sale}} \times 365 = 60$

or, $\frac{\text{Receivable}}{7800,000} \times 360 = 60$

∴ Receivable = $\frac{60}{360} \times 7800,000$

= 1300,000

(xiii) $\frac{\text{Share cap}}{\text{Reserve}} = \frac{1}{4}$

∴ Reserve = 4 SC

Again Share cap + Reserve = 1500,000

(i.e. 4800,000 − 2200,000 − 1100,000)

or SC + 4SC = 1500,000

∴ SC = $\frac{1500,000}{5}$ = 300,000

∴ Reserve = 1500,000 − 300,000 = 1200,000

Q-4A

(I) Ratios for loan based on working capital.

Bank has to use liquidity ratios to analyse short term solvency position.

For this it may use:

(a) Current Ratio
(b) Quick ratio.
(c) cash ratio &
(d) Basic defense interval

(II) Ratios for long term creditors.

Creditor has to check long term solvency position.

For this he may use "capital structure" and "coverage ratio" Namely:

(a) Debt ratio
(b) Debt service coverage ratio
(c) Interest Coverage ratio.

(III) Ratios for share holder:

Share holder can use profitability ratio to take decision regarding portfolio

For this, he may use profitability ratios from owner's point of view and profitability ratio for market & Valuation.

(a) EPS
(b) DPS
(c) REPS
(d) P/E ratio
(e) ROE
(f) payout ratio
(g) Retention ratio
(h) Dividend Yield
(i) Earning Yield etc.

(IV) Ratios to analyse utilisation of resources.

For this Finance manager can use activity ratio (ie. Turnover ratio).

(a) Fixed Assets, current Assets & Total Assets turnover ratio
(b) working capital & capital turnover ratio
(c) Receivable & payable turnover ratio etc.

Q-4B

Calculation of ratios:

Ratios	Narya Ltd	Industry
(i) Current Ratios [CA/CL]	(880,000 + 1100,000 + 3300,000) / (660,000 + 880,000 + 440,000) = 5880,000 / 1980,000 = 2.67	2.5
(ii) Receivable turnover ratio = (Sale / Receivable)	110,00,000 / 1100,000 = 10	8
(iii) Inventory turnover ratio based on sale [Sale / stock]	110,00,000 / 3300,000 = 3.33	9
(iv) Total Assets turnover ratio [Sale / Total Assets]	110,00,000 / 7700,000 = 1.43	2
(v) Net profit ratio (Net profit / Sale x100)	231000 / 110,00,000 x100 = 2.1%	3.5%

(vi) Return on total Assets $\left(\frac{\text{Net profit}}{\text{T. Assets}} \times 100\right)$	$\left(\frac{231000}{7700,000} \times 100\right)$ = 3%	7%
(vii) Return on Net worth (based on NP) $\left(\frac{\text{Net profit}}{\text{Net worth}} \times 100\right)$	$\frac{231,000}{4800,000} \times 100$ = 4.81%	10.5%
(viii) $\frac{\text{Total debt}}{\text{Total Assets}}$	$\frac{(920.000+660.000)}{+880.000+440.000}$ / 7700.000 = 0.38 (i.e. 38%)	60%

Comment:

(i) position of Narya limited is better than industry norm with respect to current ratio and Receivable turnover ratio.

(ii) Position of Narya limited is poor than Industry in respect to Inventory turnover and Total Assets turnover.

(iii) Navya Ltd performance is weaker than industry in respect to Net profit ratio, Return on total Assets and return on net worth.

(iv) Navya limited is less risky than industry in respect to debt financing.