

Cost of capital = 47,
(Book)

F.M

All question are compulsory

Q no 1. 20 marks $\left[\begin{array}{l} \text{Capital Budgeting} \rightarrow \text{Max.} \\ \text{Working capital} \\ \text{Ratio Analysis} \end{array} \right. \text{ Selective}$

Q no 2. a] 25 marks
b]

Q no 3. a] 15 marks
b]

Q no 4. a] 15 marks
b]

Q no 5 a] 15 marks.
b]

Q no 6 a. Write short notes on :- [4 Qns X 2.5 marks,
20 b. Distinguish between : [4 Qns X 2.5 marks,

- (1) Sir's Book [NA and SA]
- (2) ICAN's Study Material
- (3) ICAN Practise Manual
- (4) ICAI Practise Manual
- (5) ICAI / ICAN Revision test paper.
- (6) Rajesh Makkar Sir [At least past question]

$$\text{Tax Savings} = \text{Exp. Amt} \times \text{Tax Rate}.$$

$$\text{Net Exp} = \text{Exp. Amt} - \text{Tax Savings}.$$

$$= \text{Exp. Amt} - \text{Exp. Amt} \times \text{Tax Rate}$$

$$= \text{Exp. Amt} (1 - \text{Tax Rate})$$

Payment of dividend } Pref.
 Repayment of capital }

Interest = coupon rate

Promoters - start ma promote game

"COST OF CAPITAL" [Approx 10 Marks]

$$\text{Cost of Debt } (k_d) = \frac{\text{Interest } (1 - \text{Tax})}{\text{Net proceeds (NP)}} \times 100\%$$

A company can raise its fund from various sources; equity shares, pref shares, debentures/bonds/long term debt, retain earnings.

Equity shares are to be paid equity dividend, preference dividend for preference share holders, interest for debentures. These interest, pref dividend, equity dividend are the cost for the company. Cost can be before tax (Pre-tax) or after tax (post tax)

Cost of fund
 Source Source

Cost (Symbol)

- | | |
|---|----------|
| (i) long term loan / Debentures / Bond / long term Debt | k_d |
| (ii) Preference shares (Preferred stock) | k_p |
| (iii) Equity shares (Ordinary share) | k_e |
| (iv) Retained Earnings (ploughing back of profits) | k_{re} |

Underwriter → The person who will take the risk if share issue nayona vaye he'll take.

↓
 Underwriter commission + shares lincha.

(1) Cost of debt (k_d)

A company can raise its fund from debentures/bonds/long term loans/debt. These fund carries its own cost i.e interest which is to be paid at the end of every year. Interest is a charge against profit and hence there is tax savings. There are two types of debt.

- (a) Perpetual / Irredeemable debt.
- (b) Redeemable debt.

(A) Cost of perpetual / Irredeemable debt

The debt which are not required to be repaid during the lifetime of the business and are only to repaid at the time of liquidation of the company are called perpetual debt.

$$\text{Cost of debt } (k_d) = \frac{\text{Interest } (1 - \text{tax Rate})}{\text{Net proceeds}} \times 100\%$$

where interest = fixed interest expenses

N_p = Net amount realized

Tax rate = Corporate tax rate.

While calculating net proceeds (NP) the following items are to be deducted from issue value:

- ↳ Printing charges of prospectus.
 - ↳ Underwriting commission
 - ↳ Brokerage charge e.t.c.
- } floatation cost.

Q no 1 Soln:-

(a) Cost of irredeemable debt (k_d) = $\frac{\text{Interest} (1 - \text{tax rate})}{\text{Net proceeds}} \times 100$

(i) If issue is at par
 $k_d = \frac{1,60,00,000 (1 - 35\%)}{10,00,00,000} \times 100\%$
 $= 10.40\%$

(ii) If issue is at 10% discount
 $k_d = \frac{1,60,00,000 (1 - 35\%)}{9,00,00,000} \times 100\%$
 $= 11.56\%$

(iii) If issue is at 10% premium
 $k_d = \frac{1,60,00,000 (1 - 35\%)}{11,00,00,000} \times 100\%$
 $= 9.45\%$

(b) If brokerage @ 2% issue is at par
 $k_d = \frac{1,60,00,000 (1 - 35\%)}{9,80,00,000} \times 100\%$
 $= 10.61\%$

Q no 2 Cost of perpetual debt (k_d) = $\frac{\text{Interest} (1 - \text{tax rate})}{\text{Net proceeds}} \times 100$
 $= \frac{12 (1 - 40\%)}{100} \times 100\%$
 $= 7.2\%$

(b) If issue is at par with 5% flotation cost

$$\text{Cost of debt} = \frac{12 (1 - 40\%)}{95} \times 100\%$$
$$= 7.58\%$$

(c) If issue is at premium at 10% with 5% flotation cost

$$\text{Cost of debt} = \frac{12 (1 - 40\%)}{10 - 5\% \text{ of } 100} \times 100\%$$
$$= 6.86\%$$

(d) If issue is at 10% discount with 5% flotation cost

$$\text{Cost of debt} = \frac{12 (1 - 40\%)}{95} \times 100\%$$
$$= 8.47\%$$

Note :- If issue is at par and there is no flotation cost, cost of debt can be calculated alternatively as :-
 $k_d = \text{Interest rate} (1 - \text{tax rate})$

Q no 3 Interest rate = $12 + 4 = 16\%$

Loan = 2,00,00,000

Now,

$$\text{Cost of debt} = \frac{32,00,000 (1 - 0.4)}{2,00,00,000} \times 100\%$$
$$= 9.6\%$$

(b) Cost of redeemable debt (K_d)

The debt which are to be repaid after certain predefined time period are called redeemable debt. Debt can be issued at par, premium or discount and can be redeemed at par, premium and discount. While calculating the cost of redeemable debt interest expenses as well as loss of issue of debenture are to be considered. There is no tax saving on loss on issue.

$$\text{Cost of redeemable debt } (K_d) = \frac{\text{Interest } (1 - \text{tax rate}) + \frac{RV - NP}{n}}{\frac{RV + NP}{2}} \times 100\%$$

Q no 6 Soln:-

$$\text{Cost of redeemable debt } (K_d) = \frac{\text{Interest } (1 - TR) + \frac{RV - NP}{n}}{\frac{RV + NP}{2}} \times 100\%$$

(i) If issue is at par:-

$$\begin{aligned} \text{Cost of debt } (K_d) &= \frac{12(1 - 35\%) + \frac{100 - 100}{7}}{\frac{100 + 100}{2}} \times 100\% \\ &= \frac{7.8}{100} \times 100\% \\ &= 7.8\% \end{aligned}$$

(ii) If issue is at 10% discount,

$$\begin{aligned} \text{Cost of debt } (K_d) &= \frac{12(1 - 35\%) + \frac{100 - 90}{7}}{\frac{100 + 90}{2}} \times 100\% \\ &= \frac{7.8 + 1.428}{95} \times 100\% \\ &= 9.71\% \end{aligned}$$

(iii) If issue is at 10% premium.

$$\begin{aligned} \text{Cost of debt} &= \frac{12(1 - 0.35) + \frac{100 - 110}{7}}{\frac{100 + 110}{2}} \times 100\% \\ &= \frac{7.8 - 1.428}{105} \times 100\% \\ &= 6.07\% \end{aligned}$$

(iv) If brokerage is paid at 2% and issue is at par.

$$\begin{aligned} \text{Cost of debt} &= \frac{12(1 - 0.35) + \frac{100 - 98}{7}}{\frac{100 + 98}{2}} \times 100\% \\ &= \frac{7.8 + \frac{100 - 98}{7}}{99} \times 100\% \\ &= 8.17\% \end{aligned}$$

Q no:- A company issues Rs 10 lakh, 12% debenture of Rs 100 each. The debentures are redeemable. The company is in 35% tax bracket. Required calculate the cost of debt after tax, if debentures are issued at par.

$$\begin{aligned} \text{Cost of debt} &= \frac{12(1 - 0.35) + \frac{100 - 100}{7}}{100} \times 100\% \\ &= 7.8\% \end{aligned}$$

Assumption:- Since $RV = NP$

If issue is at par and redemption is at par then

$$K_d = \frac{12(1 - 35\%) + \frac{100 - 100}{7}}{\frac{100 + 100}{2}} \times 100\%$$

Here the value of N is irrelevant because
 $RV = NP$.

Qno A company issues Rs 10 lakh 12% debenture of 100 each, the company is in 35% tax bracket. Calculate the cost of debt.

$$\begin{aligned} \text{Cost of debt} &= \frac{\text{Interest} (1 - \text{tax rate})}{\text{Net proceeds}} \times 100\% \\ &= \frac{12 (1 - 0.35)}{100} \times 100\% \\ &= 7.8\% \end{aligned}$$

Qno Under what condition will the cost of redeemable cost will be equal to cost of irredeemable debt.

↳ To meet the criteria $RV - NP$ should be equal to zero and $\frac{RV + NP}{n}$ should be equal to net proceeds. And both of this is possible when $RV = NP$ i.e. Redemption value = Net proceeds.

Qno What are the factor that determine the cost of debt?

→ The factors that determines the cost of debt are:-

- ↳ Interest
- ↳ Tax rate
- ↳ Net proceeds
- ↳ Redemption value → at par, discount and premium.

Qno 4

$$\begin{aligned} \text{Cost of debt} &= \frac{\text{Interest} (1 - \text{rate})}{NP} \times 100 \\ &= \frac{14 (1 - 35\%)}{120 - 2\% \text{ of } 120} \times 100 \\ &= \frac{9.10}{117.76} \times 100 = 7.72\% \end{aligned}$$

(5)

$$\begin{aligned} \text{Cost of debt} &= \frac{12 (1 - 40\%) + \frac{132 - 108}{8}}{132 + 108} \times 100\% \\ &= \frac{7.2 + 3}{120} \times 100\% \\ &= 8.50\% \end{aligned}$$

(7)

$$\begin{aligned} \text{Cost of debt} &= \frac{55000 (1 - 28\%) + \frac{5,00,000 - 4,00,000}{5}}{5,00,000 + 4,00,000} \\ &= \frac{39500 + 20,000}{4,00,000} \\ &= 13.24\% \end{aligned}$$

(2) # Cost of preference share

Preference shares are the shares which have preferential right in terms of payment of dividend and repayment of capital.

Unless otherwise stated preference share are always assumed to be cumulative, non-convertible and non-participating. There are two types of preference share

- (a) Irredeemable / Perpetual preference shares
- (b) Redeemable preference shares.

Date: / /

Q1) Cost of perpetual/irredeemable preference share (k_p)

Irredeemable preference shares are the shares which are repaid only at the time of liquidation.

$$k_p = \frac{\text{Preference dividend} \times 100\%}{\text{Net proceeds}}$$

Preference dividend is an appropriation of profit and hence there is no tax savings.

Q2) X Ltd issues 1 thousand (1,000), 10% preference share of the face value of Rs 100 at a premium of 5% underwriting brokerage and other cost in connection with issues is Rs 5,000. Tax rate is 40%. Calculate the cost of preference shares.

$$= \frac{10000 \times 100\%}{105000 - 5000} = 10\%$$

Note:- If there is dividend distribution tax (DDT) or corporate dividend tax (CDT) then $k_p =$

$$k_p = \frac{\text{Pref Div} (1 + \text{DDT Rate}) \times 100\%}{\text{Net proceeds}}$$

+

Q not

$$k_p = \frac{\text{Pref Div} (1 + \text{DDT Rate})}{\text{Net proceeds}} \times 100\%$$

$$= \frac{10,000 (1 + 20\%)}{1,05,000 - 5,000} \times 100\%$$

$$= 12\% \#$$

Q3) Cost of redeemable preference share:-

The preference shares which are to be repaid after a predefined time period are called redeemable preference shares.

$$k_p = \frac{\text{Preference Div.} + \frac{RV - NP}{n}}{\frac{RV + NP}{2}} \times 100\%$$

If there is DDT or CDT

$$k_p = \frac{P \cdot D (1 + \text{DDT Rate}) + \frac{RV - NP}{n}}{\frac{RV + NP}{2}} \times 100\%$$

Q no 9 P.D = 7500

$$k_p = \frac{\text{Pref Div} (1 + \text{DDT Rate}) + \frac{RV - NP}{n}}{\text{Net proceeds}} \times 100\%$$

$$= \frac{15 (1 + 10\%) + \frac{100 - 100}{5}}{\frac{100 + 100}{2}} \times 100\%$$

$$= 16.5\%$$

(b)

$$k_p = \frac{\text{Interest } (1 + DDT) + \frac{RV - NP}{N}}{\frac{PV + NP}{2}} \times 100\%$$

$$= \frac{15(1 + 10\%) + \frac{100 - 95}{5}}{\frac{100 + 95}{2}} \times 100\%$$

$$= \frac{17.5}{97.5} \times 100\%$$

$$= 17.95\%$$

(c)

$$k_p = \frac{15(1 + 10\%) + \frac{100 - 105.6}{5}}{\frac{100 + 105.6}{5}} \times 100\%$$

$$= \frac{16.5 + 1.12}{102.8} \times 100\%$$

$$= 17.14\% = 14.96\%$$

(d)

$$k_p = \frac{15(1 + 10\%) + \frac{95 - 93.1}{5}}{\frac{100 + 93.1}{2}} \times 100\%$$

$$= \frac{16.5 + 3.45}{96.55} \times 100$$

$$= 18.52\%$$

Q no 10 Soln:-

Cost of preference share (k_p) = $\frac{\text{Dividend} + \frac{RV - NP}{N}}{\frac{RV + NP}{2}} \times 100\%$

$$= \frac{14 + \frac{100 - 92}{20}}{\frac{100 + 92}{2}} \times 100\%$$

$$= 15\%$$

(a) Cost of Preference Share (k_p) = $\frac{\text{Dividend}}{NP} \times 100\%$

$$= \frac{15}{18} \times 100\%$$

$$= 15.625\%$$

(b) Cost of Preference Shares (k_p) = $\frac{\text{Dividend}}{NP} \times 100\%$

$$= \frac{15}{96} \times 100\%$$

$$= 15.625\%$$

Some important terms:-

(a) Earnings per share (EPS):-
 EPS = $\frac{\text{Earnings available for eq. shareholders (EAF)}}{\text{No of equity share}}$

→ EPS में EAF में Dividend pay में ~~...~~

(b) Dividend Pay-out Ratio (DIP Ratio)
 It is the amount distributed out of EPS to its equity share holders.

$$\text{DIP Ratio} = \frac{\text{DPS}}{\text{EPS}} \times 100\%$$

where, DPS = $\frac{\text{Total Dividend}}{\text{No of equity shares}}$

(c) Retention ratio
 It is the amount retained by the company out of its EPS

$$= \frac{\text{Retained earnings per share}}{\text{EPS}} \times 100\%$$

$$= \frac{EPS - DPS}{EPS} \times 100\%$$

Also, $D/P \text{ Ratio} + \text{Retention Ratio} = 1$

(d) Price Earning Ratio (P/E ratio)

$$P/E \text{ Ratio} = \frac{MPS}{EPS} \times 100\%$$

It is the number of times of EPS, a company's equity share is quoted in the market.

	NABIL	ICB
MPS	1500	1600
EPS	50	70
MPS	50 → 1500	70 → 1600
	1 → 1500	1 = 1600
	50	70
	= 30 times	= 22.85 times
	(P/E ratio)	(P/E ratio)

(e) Growth rate.

40 $g = 10\%$ 41
 $EPS(E_0) = 10$ $EPS(E_1) = Rs 11$

It is the constant growth rate expected by equity share holders in their earnings and dividends.

(f) Expected Dividend (D_1)
 40 $g = 10\%$ 41

$EPS(E_0) = 10$

$DP \text{ Ratio} = 40\%$

$D_1(E_1) = 4.40$

$DPS \text{ Ratio } (D_0) = 4$

$E \text{ Expected Dividend} = 4 (4 + 10\%)$

$\therefore \text{Expected Dividend } (D_0) = E_0 (1 + g)$

$\therefore \text{Expected Dividend } (D_1) = E_1 \times D/P \text{ Ratio}$

Q no 11

(a) $EPS = Rs 10$

$DPS = Rs 6$ Now, $EPS - DPS = \text{Retained earnings}$
 $10 - 6 = 4$

$\text{Retention ratio} = \frac{\text{Retained earnings per share}}{EPS} \times 100\%$

$= \frac{4}{10} \times 100\%$

$= 40\% \text{ (4 times)}$

(b) Dividend payout ratio = 80%

Now,

$D/P \text{ Ratio} + \text{Retention Ratio} = 1$

$80\% + 40\% = 1$
 $+ 20\% = 1$

$\text{Retention ratio} = 1 - 80\%$

$= 0.2$

$= 20\%$

Q no 12 $MPS = Rs 50$

$EPS = Rs 10$

$P/E \text{ Ratio} = \frac{MPS}{EPS} \times 100\%$

$= \frac{50}{10} \times 100\%$

$= 5 \text{ times}$

$MPS = 50$
 $DPS = 10$
 Dividend payout ratio = 80%

yield = Market P/e
 Company's
 with M.P.

$$\text{EPS Div ratio} = \frac{DPS}{EPS} \times 100\%$$
 or $80\% = \frac{10}{EPS} \times 100\%$

Now, $EPS = \frac{100}{8}$
 $D/E \text{ ratio} = \frac{MPS}{EPS} = \frac{50}{\frac{100}{80}} = \frac{50 \times 80}{100} = 40\%$

Cost of Equity (Ke)

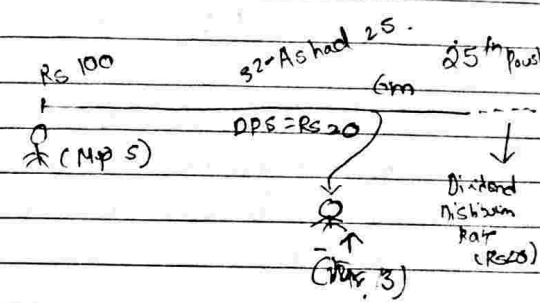
Equity shareholders expect equity dividend from the company every year which is cost for the company. Dividend is an appropriation of profit and hence there is no tax saving. Cost of equity can be calculated by following four different methods.

(a) Dividend price approach / Dividend yield approach
 In this approach equity share holder do not expect any growth in dividend i.e. current year dividend is equal to future year dividend.

(b) Cost of equity (Ke) = $\frac{DPS}{MPS} \times 100\%$
 As
 or

$$= \frac{DPS}{NPS} \times 100$$
 Net proceeds per share

where $DPS =$ Dividend per share
 $MPS =$ Market price per share (Ex. Dividend)
 $NPS =$ Net proceeds per share



A company's current market price is Rs 160 cum-dividend. The dividend just paid by the company is Rs. 10. Calculate the cost of equity.

$MPS = 160$

$$\text{Cum dividend - Ex dividend } K = \frac{DPS}{MPS} \times 100\%$$

$$= \frac{10}{150} \times 100\%$$

$$= 6.67\%$$

(c) Dividend price Approach plus growth model or Gordon's Growth Model

In this approach equity shareholder expect growth in dividends and earnings every year with the constant growth rate 'g'. The formula for calculation of cost of equity is:-

Required rate of return / opportunity cost of equity stock

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

where,

- D_1 = expected dividend after year 1
- P_0 = current market price (ex-dividend)
- g = growth rate (constant)
- NP = net proceeds

Note :- Cost of equity is also called as required rate of return, opportunity cost of equity shares or expected rate of return.

Q no 15

Soln:-

$$\text{Cost of equity } (K_e) = \frac{\text{DPS}}{\text{MPS}} \times 100\%$$

$$= \frac{50}{250} \times 100\%$$

$$= 20\%$$

(b) Soln:

$$\text{Cost of equity } (K_e) = \frac{D_1}{P_0} + g$$

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

$$= \frac{50(1+10\%)}{250} + 10\%$$

$$= 0.32\%$$

(c) Soln:-

$$\text{Cost of equity } (K_e) = \frac{\text{DPS}}{\text{MPS}} \times 100\%$$

$$15\% = \frac{30}{\text{MPS}} \times 100\%$$

$$\text{MPS} = \frac{30}{0.15}$$

$$\text{MPS} = \text{Rs } 200.$$

(d)

Soln:-

$$\text{Cost of equity } (K_e) = \frac{D_1}{P_0} + g$$

$$\text{or } 0.15 = \frac{30(1+5\%)}{P} + 0.05$$

$$\text{or } 0.1 = \frac{31.50}{P}$$

$$\text{or } P = \text{Rs } 315 \text{ \#}$$

Q no 16

Year	DPS	
D_0	1	10.50
D_1	2	11.02 $D_1 = D_0(1+g)$
D_2	3	11.58 $11.02 = 10.50(1+g) = 4.95\%$
D_3	4	12.16 $D_2 = D_1(1+g) = 11.58 = 11.02(1+g)$
D_4	5	12.76 $= 5.08\%$
D_5	6	13.40 $D_3 = D_2(1+g) = 12.18 = 11.58(1+g) = 5.01\%$

Now,

$$D_5 = D_0(1+g)^5$$

$$13.40 = 10.50(1+g)^5$$

$$1+g = 5 \text{ times } (\sqrt[5]{1.28}), \text{ } -1, \div 5, +1 (X=) 5 \text{ times}$$

$$1+g = 1.05$$

$$\therefore g = 0.05 \text{ i.e. } 5\%$$

Qno 18 Computation of growth rate.

$$D_0 = 5$$

$$D_1 = 5.85$$

Now,

$$D_1 = D_0 (1+g)^4$$

$$5.85 = 5 (1+g)^4$$

$$1.17 = (1+g)^4$$

Hence $g = 0.04$ i.e. 4%

As per Dividend growth model (Gordon's Model)

$$\text{Cost of equity } (k_e) = \frac{D_1}{P_0} + g = \frac{5.85 (1+4\%)}{33.80} + 4\%$$

$$= 22\%$$

Qno 15 \Rightarrow From the past year dividends.

$$13.40 = 10.50 (1+g)^5$$

$$1.27 = \dots$$

$$g = 5\%$$

Calculation of cost of equity k_e .

As per Growth model

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

$$= \frac{14.10}{150 - 3} + 0.05$$

$$= 0.1459$$

$$= 14.59\% \#$$

Qno 17 Soln:-

From the past year dividend.

$$30 = 26 (1+g)^3$$

$$\text{or, } (1+g)^3 = 1.15$$

$$1+g = \sqrt[3]{1.15} = 1.05 \text{ [3 times]}$$

$$(x =) \text{ 3 times}$$

$$g = 0.05$$

$$\text{i.e. } 5\%$$

As calculation of cost of equity (k_e).

As per Gordon's Growth Model.

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

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

$$= \frac{30 (1+5\%)}{235 - 30} + 0.05$$

$$= 20.87$$

Ex dividend line
21 fa |

235 - 30
= 20.87. (inaki P₀) 21 fa

(c) Earnings Price Approach

Use

(i) If D.P. Ratio = 100%

(ii) If only EPS is given and no information about DPS.

$$\text{Cost of equity } (k_e) = \frac{\text{EPS}}{\text{MPS}} \times 100\%$$

$$k_e = \frac{1}{\text{P/E Ratio}} \times 100$$

Qno 1

$$\text{EPS} = \frac{60,000}{20,000} = 3 \text{ Rs. Earnings available}$$

No. of shares.

$$\text{Now, Cost of equity } (k_e) = \frac{\text{EPS}}{\text{MPS}} \times 100\%$$

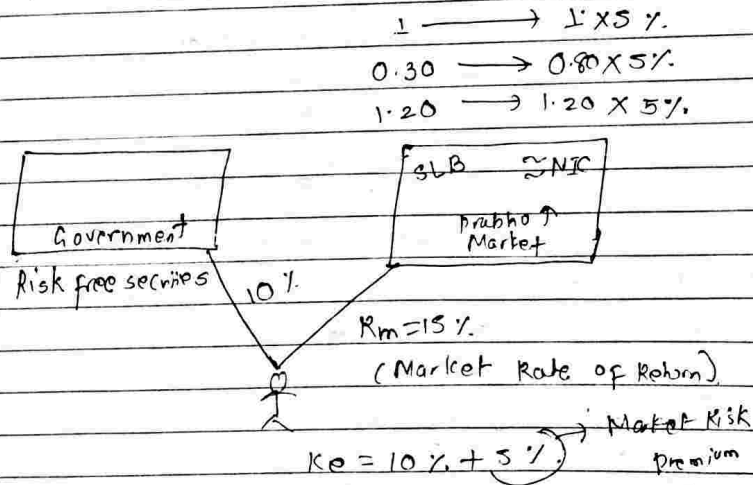
As per earnings price approach.

$$\text{Cost of equity} = \frac{\text{EPS}}{\text{MPS}} \times 100\%$$

$$= \frac{3}{20} \times 100\%$$

$$= 15\%$$

(D) Capital Assets pricing model (CAPM).



CAPM is based on the principle on higher the risk higher the return. As per CAPM, the cost of equity is calculated as

$$K_e = \text{Risk free securities} + \text{Risk premium}$$

(a)
(b)

Govt

(a) Risk free securities :- Risk free securities are the securities which have no risk of default of interest and principle. These securities are issued by government. Example :- Government Bonds, government Debenture, Treasury Bills, GON Bonds / Debentures.

(b) Risk premium :-

It is the extra return expected by the equity share holders for taking extra risk. This is the premium for market risk (Systematic Risk). Market risk / Systematic risk of individual company's stock is measured by Beta (β). Beta is also called sensitivity index. The value of β can be greater than 1, less than 1, equal to 1 and equal to 0.

- | Value of Beta | Meaning |
|-------------------|---|
| (i) $\beta > 1$ | A company's stock has more risk than that of the other company in the market. |
| (ii) $\beta < 1$ | A company's stock has less risk than that of the other company in the market. |
| (iii) $\beta = 1$ | A company's stock has same risk as that of other company in the market. average risk (i.e. same risk as that of market) |
| (iv) $\beta = 0$ | No risk at all |

Note :- The Beta of market is always equal to 1.

Note :- The Beta of government securities is always equal to 0.

1.20
3 times
1.60

Date / /

Qno 9

Soln:-
Calculation of growth rate.

$$D = D_0(1+g)^3$$

$$1.60 = 1.20(1+g)^3$$

or, $(1+g)^3 = 1.3333$

or, $(1+g)^3 = (1.1)^3$

or, $1+g = 1.1$

$g = 0.1$

i.e growth rate = 10%

As per dividend growth model (Gordon's Model),

$$\text{Cost of equity } (K_e) = \frac{D_1}{P_0} + g$$

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

$$= \frac{1.60(1+10\%)}{14} + 10\%$$

$$= 17.33\%$$

Formula for computation of β

β = Correlation coefficient

$$\beta = \frac{\text{corr. coeff (Security, Market)} \times \text{S.D of security}}{\text{S.D of market}}$$

Financial risk \Rightarrow Fixed financial cost = Debt and preference share.
 $\frac{OL}{EAT} = \frac{\text{Cont'n}}{EBT}$ can be infinite at BEP
 (can never be 1)

Question no 22

$$B = \frac{\text{corr. Coeff. (Security, Market)} \times \text{S.D of security}}{\text{S.D of market}}$$

$$= \frac{0.80 \times 2.50}{2}$$

$$= 1$$

Computation of cost of equity (K_e):-
As per

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

$$= 13\% + 1(15\% - 13\%)$$

$$= 15\%$$

(b) Soln:-

As per CAPM,

$$\text{Cost of equity} = R_f + \beta(R_m - R_f)$$

$$= 10\% + 0.5(15\% - 10\%)$$

$$= 10\% + 2.50\%$$

$$= 12.50\%$$

Qno 23

Soln:-

(a) As per CAPM;

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

$$= 6.40 + 1.70(5.5\%)$$

$$= 15.75\%$$

(b) As per CAPM,

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

$$= 7.50 + 1.70(5.50)$$

$$= 16.85\%$$

Since there is no debt, company is not having any financial risks. So, whole of the risk of business can be attributed to business risk only.

Computation of overall β

Overall β = Weighted average β [Giving equity investment as an weight].

If a company is having different segments or department of business then an overall β is calculated to determine the overall risk to the equity shareholders.

Q no 27

Overall β of company ABC Ltd.

$$\begin{aligned} \text{Overall } \beta &= \text{Weighted average } \beta \text{ [Equity investment as weight]} \\ &= 1.10 \times \frac{100}{400} + 1.50 \times \frac{100}{400} + 2.00 \times \frac{100}{400} \\ &\quad + 1 \times \frac{150}{400} \\ &= 1.28 \end{aligned}$$

Cost of equity for ABC Ltd,

$$\begin{aligned} k_e &= R_f + \beta (R_m - R_f) \\ &= 7.50\% + 1.28 \times 8.50\% \\ &= 18.58\% \end{aligned}$$

Cost of equity for each division:-

Division	$k_p = R_f + \beta (R_m - R_f)$
Main frame	$7.50 + 1.10 \times 8.50\%$ $= 16.85\%$
Personnel computers	$7.50 + 1.50 \times 8.50$ $= 20.25\%$
Software	$7.50 + 2.00 \times 8.50$ $= 24.5\%$
Printers	$7.50 + 1.00 \times 8.50$ $= 16\%$

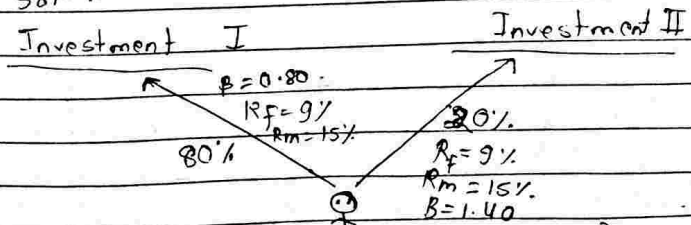
Q 28

$$\begin{aligned} \beta &= 1.50 & 1.30 \\ \text{Eqty} &= 2 \text{ billion} & 1 \text{ billion} \end{aligned}$$

$$\begin{aligned} \text{Overall } \beta &= 1.50 \times \frac{2}{3} + 1.30 \times \frac{1}{3} \\ &= 1.43 \end{aligned}$$

Q no 26

Soln:-



For Investment I (8% Investment)

$$\begin{aligned} \text{Cost of equity } (k_e) &= R_f + \beta (R_m - R_f) \\ &= 9\% + 0.80 (15\% - 9\%) \\ &= 13.80\% \end{aligned}$$

For Investment II (20% Investment)

$$\begin{aligned} \text{Cost of equity } (k_e) &= R_f + \beta (R_m - R_f) \\ &= 9\% + 1.40 (15\% - 9\%) \\ &= 17.40\% \end{aligned}$$

(ii) Soln:-

$$\begin{aligned} \text{Overall } \beta &= \text{Weighted average } \beta \\ &= 0.80 \times 80\% + 1.40 \times 20\% \\ &= 0.92 \end{aligned}$$

(iii) Soln:-

$$\begin{aligned} \text{Overall return } (k_e) &= R_f + \beta (R_m - R_f) \\ &= 9\% + 0.92 (15\% - 9\%) \\ &= 14.52\% \end{aligned}$$

Alternatively

$$k_e = 13.80 \times 80\% + 17.40 \times 20\% = 14.52\%$$

Distinguish between systematic risk and unsystematic risk.

Systematic risk

- 1) Systematic risk are the market related risk and it impacts all the industry/corporate in the market.

Unsystematic risk

- 2) Unsystematic risk is the unique risk associated with particular business entity and do not affect other industry.

- 2) These risk are unavoidable in nature.

- 2) These risk are avoidable in nature.

Systematic risk

Unsystematic risk

- 3) These risk are not within the control of company and mgmt.

Eg:- Inflation risk, seasonal risk, government directives, interest rate risk etc.

- 3) These risk are under the control of the management.

Eg:- Strike is a factory, ill health of key person, loss incurred by fire etc.

Qno 29

Z enterprises has a β of 1.45. The risk free rate is 10% and the expected return on the market portfolio is 16%. The company presently pays of Rs. 2 a share and investors expect it to experience a growth in dividend of 10% p.a for many years to come. What is the stock's required rate of return according of CAPM.

- (b) What is the stock present market price per share, assuming these required return.

Soln:-
As per CAPM;

$$\begin{aligned} k_e &= R_f + \beta (R_m - R_f) \\ &= 10\% + 1.45 (16\% - 10\%) \\ &= 18.70\% \end{aligned}$$

As per Gordon's Growth Model

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

$$\text{or, } 18.70 = \frac{2(1+10)}{P_0} + 10\%$$

$$\text{or, } P_0 \cdot 18.70 = 2 \cdot 2 + 10\% \cdot P_0 \implies P_0 = \frac{2 \cdot 2}{8.70} \%$$

= 25.29 } for the equilibrium price

(4) Cost of Retained earnings (Kre).

The profit which is not distributed to owner is called retained earnings. This is also called plug-in back up profit. An equity shareholder have same expectation on retained earnings as that of equity share capital. That is why cost of retained earnings is normally same as that of cost of equity.

The cost of retained earnings is calculated as follows:-

(i) $k_{re} = \frac{DPS}{MPS} \times 100\%$ or ~~$\frac{DPS}{NPS} \times 100\%$~~

(ii) $k_{re} = \frac{D_1}{P_0} \times 100\%$ or ~~$\frac{D_1}{N.P} \times 100\%$~~

(iii) $k_{re} = \frac{EPS}{MPS} \times 100\%$

(iv) $k_{re} = R_f + \beta (R_m - R_f)$

Q no 30 $D_0 = Rs 4.19$
Q no 31 $P_0 = Rs 50$
 $g = 5\%$

Now,

$$k_{re} = \frac{D_1}{P_0} \times 100\%$$

$$= \frac{D_0(1+g)}{P_0} \times 100\%$$

$$= \frac{4.19(1+5\%)}{50} \times 100\%$$

$$= 8.799\%$$

Q no 31

$$R_f = 7\%$$

$$R_m - R_f = 6\%$$

$$\beta = 1.20$$

Now,

$$k_{re} = R_f + \beta (R_m - R_f)$$

$$= 7\% + 1.20(6\%)$$

$$= 7\% + 7.2\%$$

$$= 14.2\%$$

Calculation of cost of retained earnings. when there is personal income tax of shareholders (tp) and brokerage charge payable by shareholders (B) in purchasing the another company's share.

$$k_{re} = k_e (1 - t_p) (1 - B)$$

Q no 32 Soln:-

If the retained earnings of Rs 7,50,000 is distributed to equity share holders:

Amount received by shareholders	7,50,000
(-) Shareholders Personal Income tax 30%	2,25,000
	<u>5,25,000.</u>

(-) Brokerage charge payable by shareholders in purchasing another company's share @ 3% 15,750
Amount to be invested in to another

company
Equity share holders expectations @ 10% 509250
Here,

The adjusting company can bargain for paying amount of Rs. 50925 for using retained earnings of Rs 7,50,000.

Hence, cost of retained earning is:-

$$k_{re} = \frac{50925}{7,50,000} \times 100\%$$

$$= 6.79\%$$

Alternatively,

$$k_{re} = k_o (1 - t_p) (1 - \beta)$$

$$= 10\% (1 - 30\%) (1 - 3\%)$$

$$= 6.79\%$$

Weighted average cost of capital (WACC)

Overall cost of capital (k_o).

(Note: WACC can be considered as discounting rate) *

A company can raise its fund from different sources such as equity share capital, retained earnings, preference share capital and long term debt. Each source has their own cost. A single weighted average cost is calculated by considering all the components which is called weighted average cost of capital or overall cost of capital (k_o).

Calculation of WACC

Sources	₹	Amount	Weight	Cost	(a) X (b)
Equity S. Cap	xxx		W_e	k_e	$W_e \times k_e$
Ret. Earnings	xxx		W_{re}	k_{re}	$W_{re} \times k_{re}$
10% PSC	xxx		W_p	k_p	$W_p \times k_p$
10% Debt	xxx		w_d	k_d	$w_d \times k_d$
	xxx				WACC

$$i.e. k_o / WACC = k_e \times W_e + k_{re} \times W_{re} + k_p \times W_p + k_d \times W_d$$

Q no 35

Soln:-

Calculation of WACC

Source	Amount	Weight (a)	Cost (b)	(a) X (b)
Equity share capital	50,00,000	0.55	14.70%	8.08%
10% pref shares	10,00,000	0.11	10%	1.1%
12% Debentures	30,00,000	0.33	8.40%	2.772
	90,00,000	1.00		12.34%

Working note:-

Calculation of cost of 12% Debenture (k_d)

$$k_d = \text{Interest Rate} (1 - \text{tax rate})$$

$$= 12\% (1 - 30\%)$$

$$= 8.40\%$$

Q no 33 Soln:-

As per Dividend yield model

$$\text{Cost of Equity (Ke)} = \frac{D_1}{NP} = \frac{2}{10.45} \times 100$$

$$\therefore NP = 10 + 1 = 11 = 19.14\% \#$$

$$= 11 \times 5\% = 0.55 = 10.45$$

$$\text{Cost of retained earning (Kre)} = \frac{D_1}{MP} \times 100$$

$$= \frac{2}{15} \times 100 = 13.33\% \#$$

Q no 34 Here,

(i) Dividend yield method

Dps = 2.40
N.P.S = 28

$$K_e = \frac{2.40}{28} \times 100\% = 8.57\% \#$$

(ii) Dividend growth model

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

$$= \frac{2.40(1.15)^5}{28} + 5\% = 14\%$$

(iii) Capital assets pricing model

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

$$= 10\% + 1.2 (14\% - 10\%)$$

$$= 10\% + 4.8\%$$

$$= 14.80\% \#$$

(iv) Earning price model

$$= \frac{E.P.S}{M.P.S} \times 100\%$$

$$= \frac{3.90}{28} \times 100\%$$

$$= 13.92\% \#$$

Q no 37 Soln:-

(a) Calculation of WACC (Book Value)

Sources	Amount (B.V)	Weight (a)	Cost (b)	(a x b)
Equity S. Capital	45,000	0.45	14%	6.30%
Retained earning	15,000	0.15	13%	1.95%
Prep. share capital	10,000	0.10	10%	1.00%
Debentures	30,000	0.30	5%	1.50%
	1,00,00	1.00		WACC = 10.75%

(b) Soln:- Calculation of WACC (Market value)

Sources	Amount (M.V)	Weight (a)	Cost (b)	(a x b)
Equity S. Capital	67,500	0.52	14%	7.28%
Retained earning	22,500 (W.N.S)	0.17	13%	2.21%
Prep. share capital	10,000	0.08	10%	0.8%
Debenture	30,000	0.23	5%	1.15%
	1,30,000	1.00		WACC = 11.44%

$$12M + 4M \rightarrow 84M$$

$$700 \times 120,000$$

(84)

Working note

(1) Calculation of MV of Equity Share Capital and Retained Earnings:

$$(45,000 \text{ ESC} + 15,000 \text{ RE}) \text{ represents } 90,000 \text{ MV of ESC \& RE}$$

$$45,000 \text{ ESC represents } \frac{90,000}{60,000} \times 45,000 \text{ MV of ESC}$$

$$= \text{Rs } 67,500$$

$$15,000 \text{ RE represents } \frac{90,000}{60,000} \times 15,000 \text{ MV of RE}$$

$$= \text{Rs } 22,500$$

Q no 36

Calculation of WACC (Market Value)

Source	Amount (MV)	Weight (a)	Cost (b)	(a) x (b)
Equity share capital	30,00,000 (60%)	0.30	17% (WACC)	5.10%
Reserve and surplus	30,00,000 (60%)	0.30	17%	5.10%
12% Pref. Shares	10,00,000	0.10	12%	1.20%
9% Debenture	30,00,000	0.30	5.4%	1.62%
	1,00,00,000	1.00		WACC 13.02%

Working note no: 2 Calculation of cost of equity share (k_e)

⇒ As per Gordon's growth model,

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

$$= \frac{8}{30} + 0.107\%$$

$$= 17\%$$

Market Capitalization = ...

Until and unless question be market value market
 ↓ go hitaina pardaina

Working note

(1) Calculation of market value of equity share capital and retained reserves and surplus.

$$20,00,000 \text{ ESC} + 20,00,000 \text{ R\&S represents Rs } 60,00,000 \text{ MV of ESC}$$

$$20,00,000 \text{ ESC represents } \frac{\text{Rs } 60,00,000}{40,00,000} \times 20,00,000$$

$$= \text{Rs } 30,00,000 \text{ MV of ESC}$$

$$20,00,000 \text{ R\&S represents } \frac{\text{Rs } 60,00,000}{40,00,000} \times 20,00,000$$

$$= \text{Rs } 30,00,000 \text{ MV of R\&S}$$

(3) Since there is no flotation cost payable by the company there is no personal & income tax of shareholder and there is no brokerage charge payable by the shareholder in purchasing another company's share, therefore
 $k_{re} = k_e = 17\%$

(4) Calculation of cost of 9% Debenture.

$$k_d = \text{Interest Rate} (1 - \text{Tax rate})$$

$$= 9\% (1 - 40\%)$$

$$= 5.4\%$$

HW 38

Q no 38

Computation of WACC

Sources	Amount	Weight(a)	Cost(b)	(a) X (b)
Equity	400	0.20	20%	4.00%
12% Debenture	400	0.20	12%	2.40%
Term loan	1200	0.60	18%	10.80%
	<u>2000</u>	<u>1.00</u>	<u>WACC</u>	<u>17.20%</u>

W. Note calculation :-

① Cost of equity (Ke)

$$= \frac{D_1}{P_0} \times 100$$

$$= \frac{400 \times 20\%}{400} \times 100\%$$

$$= 20\%$$

Computation of WACC

Sources	Amount	Weight(a)	Cost(b)	(a) X (b)
Equity	400	0.20	12.50	2.50%
12% Debenture	400	0.20	12%	2.40%
Term loan	1200	0.60	18%	10.80%
	<u>2000</u>	<u>1.00</u>	<u>WACC</u>	<u>15.70%</u>

W. Note calculation Since price increased by ₹ to 160
 1 share = $\frac{160}{100} = 1.6$

① Cost of equity (Ke)

$$= \frac{D_1}{P_0} \times 100$$

$$= \frac{400 \times 20\%}{400 \times 1.6} \times 100\%$$

② 7) $7 \times 21 = 227$

$$= \frac{80}{640} \times 100\%$$

$$= 12.50\%$$

(c) Effect of cost of capital

Without price increment

Source	Amount	Weight(a)	Cost(b)	(a) X (b)
Equity	400	0.20	20% 12.50%	4.00%
12% Debenture	400	0.20	7.20%	1.44%
Term loan	1200	0.60	10.80%	6.48%
	<u>2000</u>	<u>1.00</u>	<u>WACC</u>	<u>11.92%</u>

Here, For Debenture = Interest (1 - tax rate)
 $= 12\% (1 - 0.4)$
 $= 7.2\%$

For Term loan = Interest (1 - tax rate)
 $= 18\% (1 - 0.4)$
 $= 10.8\%$

With price increment

Source	Amount	Weight(a)	Cost(b)	(a) X (b)
Equity	400	0.20	12.50%	2.50%
12% Debenture	400	0.20	7.20%	1.44%
Term loan	1200	0.60	10.80%	6.48%
	<u>2000</u>	<u>1.00</u>	<u>WACC</u>	<u>11.92%</u>

Q no 39

(i) Soln:-

Calculation of WACC

Source	Amount (a)	Weight (b)	Cost (c)	(a) x (b)
Equity share capital	40,00,000	0.50	15%	7.50%
11.50% Pref share	10,00,000	0.125	11.5%	1.44%
10% Debenture	30,00,000	0.375	6.50%	2.44%
	80,00,000	1.00	WACC	11.38%

(1) Working notes:- As per

(1) Calculation of equity share capital.

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

$$= \frac{2}{20} + 5\%$$

$$= 15\%$$

(2) Interest Rate (1 - Tax Rate)

$$= 10\% (1 - 0.35)$$

$$= 6.50\%$$

(ii) Soln:-

Source	Amount	Weight (a)	Cost (b)	(a) x (b)
Equity share capital	40,00,000	0.40	20%	8%
11.50% Pref share	10,00,000	0.10	11.50%	1.15%
10% Debenture	30,00,000	0.30	6.50%	1.95%
12% Debenture	20,00,000	0.20	7.8%	1.56%
	1,00,00,000	1.00	WACC	12.66%

(a) Working notes:-

(1) Calculation of cost of equity (K_e)

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

$$= \frac{2.00}{16} + 0.05$$

$$= 20\%$$

(iii) Soln:-

WACC can be calculated by giving weight to book value or market value. Book value is given priority because of:-

- (i) Book value is available for all companies from their books of account. Market value for unlisted public companies and private companies can not be determined easily.
- (ii) Market price fluctuates widely and frequently and hence it's not feasible to determine WACC at every market price.

Q no 43

Calculation of WACC

Sources	Amount	Weight (a)	Cost (b)	(a) x (b)
Equity share capital	90,000	0.563	12.50%	7.04%
General reserve	18,000	0.113	12.50%	1.41%
Debt	52,000	0.324	4%	1.30%
	1,60,000	1.00	WACC	9.75%

Calculation (Working note)

(1) Calculation of cost of equity.

$$EPS = \frac{EAE}{\text{No. of equity shares}}$$

$$= \frac{3,500}{900} = \text{Rs } 15 \text{ per share.}$$

$$\begin{aligned} \therefore \text{Cost of equity } (k_e) &= \frac{\text{EPS}}{\text{MPS}} \times 100\% \\ &= \frac{15}{120} \times 100\% \\ &= 12.50\% \end{aligned}$$

(2) Calculation of cost of general reserve
 $k_c = k_{re} = 12.50\%$

Q no 45 soln:-

Calculation of cost of equity (k_e):-

As per CAPM:-

$$\begin{aligned} k_e &= R_f + \beta (R_m - R_f) \\ &= 6\% + 0.80 \times 6\% \\ &= 10.80\% \end{aligned}$$

Yeti vane dit
 Market risk premium
 no

As per Gordon's growth model;

$$\begin{aligned} k_e &= \frac{D_1}{P_0} + g \\ &= \frac{1.20(1+8\%)}{45} + 0.08 \\ &= 10.88\% \end{aligned}$$

$$\begin{aligned} \text{Average } k_e &= \frac{10.80\% + 10.88\%}{2} \\ &= 10.84\% \end{aligned}$$

Calculation of WACC

Sources

→

Debt-equity

Debt-equity
 50
 150

Sources	Amount	Weight (a)	Cost (b)	(a) × (b)
Debt	Amount is invariant when weight is given. 50	0.33	5.85%	1.93%
Equity	100	0.67	10.84%	7.26%
	150	1.00	WACC	9.19%

Q no 46 soln:-

Calculation of k_o

Debt : Equity	$k_d = 4\% + \frac{x-20}{30}$	$k_e = 10\% + \frac{x}{y}\%$	$k_o = k_d \times W_d + k_e \times W_e$
0 : 100	-	10%	10%
20 : 80	4%	$10 + \frac{20}{80} \times 4\% = 11\%$	$4 \times \frac{20}{100} + 11 \times \frac{80}{100} = 9.60\%$
40 : 60	$4 + \frac{40-20}{30}$	$10 + \frac{40}{60} \times 4\%$	$4.67 \times 0.40 + 12.67 \times 0.60 = 9.47\%$
60 : 40	$4\% + \frac{60-20}{30}$	$10 + \frac{60}{40} \times 4\%$	$5.33 \times 0.60 + 16 \times 0.40 = 9.60\%$
80 : 20	$4 + \frac{80-20}{30}$	$10 + \frac{80}{20} \times 4\%$	$6\% \times 0.80 + 26\% \times 0.20 = 10\%$

The optimum capital structure is the capital structure having debt equity ratio of 40:60. This capital structure is favourable for the company.

gearing = Capital str. ma Debt aayo vany.

Date: / /

Q no 47 Before expansion

MV of equity = Rs 6,00,000
 Dividend = Rs 1,20,000
 Cost of equity (k_e) = 20%
 Dividend = $\frac{DPS}{MPS} \times 100\%$
 $= \frac{1,20,000}{6,00,000} \times 100\%$
 $= 20\%$

MV of equity = ?
 Dividend = 1,20,000
 + interest after tax @ 15,000 = 1,35,000
 Cost of equity (k_e) = 21.60%
 Net cash Receipt = 1,05,000.

Q no 47

Soln:-

EBIT	105,000
(-) Interest	90,000
EBT	15,000
(-) Tax @	-
EBT after tax	15,000

Calculation of MV. Eq. shares after expansion

Particulars	Rs
Earnings before interest (Net Cash Receipts)	105,000
(-) Interest on Debenture	90,000
Earnings before	15,000
(-) Tax	-
Earnings after tax	15,000
(-) Pref Dividend	-
Earnings available for debt	15,000
Add: Dividends from existing investment	1,20,000
Total Dividends	1,35,000
Revised cost of equity (k_e)	21.60%
Revised MV [MV = Revised Dividends]	1,35,000
k_e	21.60%

= Rs 6,25,000
 Gain made by shareholders = Rs 6,25,000 -
 Rs 6,00,000
 = Rs 25,000

(b)

Soln:-

WACC before expansion:-

$k_a = k_e$ ∵ Company is entirely financed by equity
 = 20% (∵) no debt there
 so overall $k_e \Rightarrow$ cost 20%

Calculation of WACC (after expansion)

Source	Amount	Weight (a)	Cost (b)	(a) X (b)
Debt	5,00,000	0.44	12%	5.28%
Equity	6,25,000	0.56	21.60%	12.10%
	11,25,000	1.00	WACC	20%

Hence, WACC is not affected by gearing.

us and us / H/W
~~Rs 5,000~~
 15,000
 62,500

Q no 1

Computation of WACC (Book value)

Source	Amount	Weight (a)	Cost (b)	(a) x (b)
Equity capital	6	0.67	9.20%	6.164
Reserve & surplus	1.20	0.13	9.20%	1.186
Debt	1.80	0.20	8.40%	1.68
	9	1	WACC	9.04%

Working note

(Calculation of cost of equity (ke))

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

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

$$= \frac{24 (1+5\%)}{600} + 5\%$$

$$= 9.20\%$$

Since there is no flotation cost $k_e = k_{rp} = 9.20\%$

$$\text{Interest } (1 - \text{Tax rate})$$

$$= 12\% (1 - 0.30)$$

$$= 8.40\%$$

Computation of WACC

Source	Amount	Weight (a)	Cost (b)	(a) x (b)
Equity capital	6	0.50	10.04%	5.02%
Reserve & surplus	1.20	0.10	10.04%	1.00%
12% Debt	1.80	0.15	8.4%	1.26%
18% Debt	3	0.25	12.60%	3.15%
	12	1	WACC	10.43%

Working note

(i) Calculation of cost of equity

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

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

$$= \frac{24 (1+5\%)}{500} + 5\%$$

$$= 10.04\%$$

Q no 2

(a) (i) Cost of equity (ke)

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

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

$$= \frac{25 (1+5\%)}{200} + 5\%$$

$$= 18.125\%$$

(ii) Cost of pref. share = 9%

(iii) Debt = Interest (1 - Tax rate)

$$= 11 (1 - 0.30)$$

$$= 7.70\%$$

(iv) Cost of retained earnings

$$k_{re} = k_e (1 - t) (1 - \beta)$$

Since no brokerage charge

$$k_{re} = k_e (1 - t)$$

$$= 10.04\% (1 - 0.20)$$

$$= 14.50\%$$

(b) WACC (On the basis of book value weight)

Source	Amount	Weight (a)	Cost (b)	(a) X (b)
Equity share	80,00,000	0.40	18.125%	7.25%
Pref. share	20,00,000	0.10	9%	0.90%
11% Debenture	60,00,000	0.30	7.70	2.31%
Retained earnings	40,00,000	0.20	14.80	2.96%
	20,00,000		WACC	13.36%

(c) Computation of WACC (Book Value Weights).

Source	Amount	Weight (a)	Cost (b)	(a) X (b)
Equity share	16,00,000	0.43	18.125%	7.79%
Pref. share	2,40,000	0.10	9.00%	0.90%
11% Debenture	6,60,000	0.26	7.70%	2.00%
Retained earnings	5,33,333.33	0.21	14.50%	3.05%
	25,00,000	1		13.74%

Working note

$$80,00,000 \text{ equity share} + 20,00,000 \text{ pref share makes Rs } 16,00,000 \text{ of equity share EPS}$$

$$80,00,000 \text{ equity share represents } \frac{16,00,000}{12,00,00,000} \times 80,00,000$$

$$= 10,666,667$$

$$= 1,80,00,000 - 10,666,667$$

$$= 5,33,333.33$$

Qn 04 Soln:-

Source	Amount	Weight (a)	Cost (b)	(a) X (b)
Equity share mtd	10,90,000	0.44	18.070%	7.88%
Share premium	2,25,000	0.11	18.070%	1.97%
Reserve	8,17,500	0.33	18.070%	5.91%
Share holders fund				
12% Indebtable	3,20,000	0.13	12%	1.54%
Debentures			WACC	17.29%

Working notes

(1) Computation of cost of Equity (K_e).

As per dividend growth model,
Cost of equity (K_e) = $\frac{D_1}{P_0} + g$

$$= \frac{2(1+10\%)}{27.25} + 10\% = 18.07\%$$

Also since there is no flotation cost of share premium and reserves is same as cost of equity.

(2) Cost of Debt = Interest (1 - Tax)
= 12 (1 - 0%) = 12.

$$8,00,000 \text{ Equity share} + 2,00,000 \text{ share premium} + 6,00,000 \text{ Reserve represent}$$

$$27.25 \times 80,000 = 21,80,000 \text{ M.V of equity share paid now.}$$

$$8,00,000 \text{ Equity} \times \frac{21,80,000}{16,00,000}$$

$$= 10,90,000.$$

Same from share premium and reserves.

MARGINAL COST OF CAPITAL

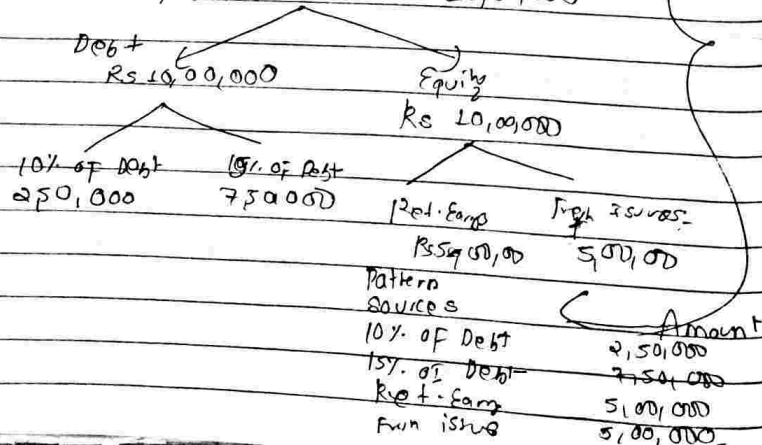
The cost of additional fund is marginal cost of capital. The weighted average cost of additional fund is called weighted marginal cost of capital (WMCC). Unless otherwise stated the existing capital structure is ignored for calculation of WMCC. i.e. only additional fund is considered, while calculating WMCC, the target capital structure ratio is to be maintained.

Qno 50	ESC	B/S
	ESC of Rs 1000	1,00,000
	Ret. Earnings	5,00,000
	pref Share Capital	20,00,000
	10% Debenture of Rs 100	15,00,000
		59,00,000

Additional fund = Rs 20,00,000

Debt : Equity = 1 : 1

Additional fund = Rs 20,00,000



Qno 48

Calculation of WACC (Using Book Value)

Source	Amount	Weight (a)	Cost (b)	(a) x (b)
Debt	8,00,000	0.40	4.28%	1.71%
Pref. share	2,00,000	0.10	10.59%	1.06%
Equity share	10,00,000	0.50	15%	7.50%
	20,00,000		WACC	10.27%

Calculation of WACC (Using Market Value)

Source	Amount	Weight (a)	Cost (b)	(a) x (b)
Debt	88,00,000	0.27	4.280%	1.13%
Pref. share	240,000	0.07	10.590%	0.76%
Equity share	2,200,000	0.66	15.000%	9.95%
	3,320,000		WACC	11.84%

Working Notes

(1) Cost of debt (kd).

$$k_d = \frac{\text{Interest} (1 - \text{Tax Rate}) + \frac{RV - NP}{n}}{\frac{RV + NP}{2}} \times 100\%$$

$$= \frac{8\% (1 - 0.50) + \frac{100 - 96}{20}}{\frac{100 + 96}{2}} \times 100$$

$$= \frac{4 + 0.2}{98} \times 100$$

$$= 4.28\%$$

2. Cost of preference share

$$k_p = \frac{\text{Interest} + \frac{RV-NP}{n}}{\frac{RV+NP}{2}} \times 100\%$$

$$= \frac{10 + \frac{100-95}{15}}{\frac{100+95}{2}} \times 100\%$$

$$= 10.59\%$$

3. Cost of equity (ke)

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

$$= \frac{2}{20} + 5\%$$

$$= 15\%$$

Don't

Qno 49 Calculation of WACC (Market Value Weights)

Source	Amt	Weight (a)	Cost (b)	(a) x (b)
Debt	288,750	0.17	5.468%	0.91%
Prep. share	238,500	0.14	11.133%	1.54%
Equity share	12,00,000	0.70	15.000%	10.49%
	<u>17,27,250</u>	<u>1.00</u>	WACC	<u>12.87%</u>

$$\text{Amount of Debenture} = \frac{2,75,000}{100} \times 105$$

$$= 2,88,750$$

Working note

(1) Calculation of cost of debenture

$$k_d = \frac{\text{Interest} (1 - \text{Tax rate}) + \frac{RV-NP}{n}}{\frac{RV+NP}{2}} \times 100$$

$$= \frac{9\% (1 - 0.35) + \frac{100-103}{10}}{\frac{100+103}{2}} \times 100$$

$$= 5.468\%$$

(2) Calculation of cost of pref. share:

$$k_p = \frac{\text{Interest} + \frac{RV-NP}{n}}{\frac{RV+NP}{2}} \times 100$$

$$= \frac{11\% + \frac{100-103}{10}}{\frac{100+103}{2}} \times 100$$

$$= \frac{7.15 + (-0.3)}{2.03} \times 100$$

$$= 11.133\%$$

(3) Computation of cost of Equity (ke)

As per dividend growth model

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

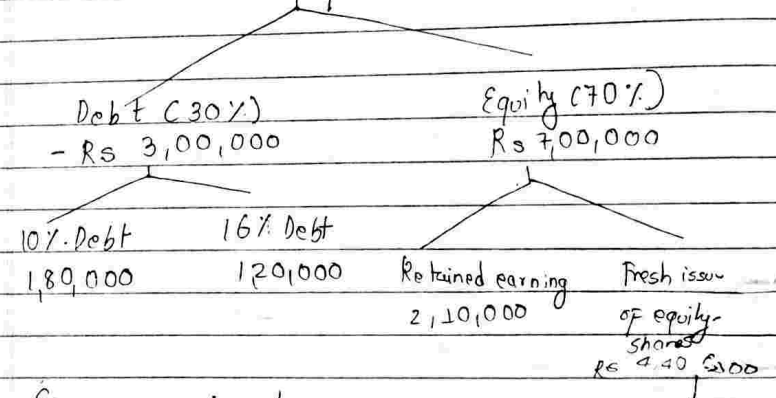
$$= \frac{2}{20} + 5\%$$

$$= 15\%$$

Qno 50

(a) Soln:-

Pattern of raising additional fund
Additional fund = Rs 10,00,000



Sources	Amount
10% Debt	1,80,000
16% Debt	1,20,000
Ret. Earning	2,10,000
Equity share (Fresh)	4,90,000
Total	10,00,000

(b) Soln:-

Post tax average cost of debt

$$\text{Cost of debt } (K_d) = \text{Interest} (1 - \text{Tax rate})$$

$$= 10\% \text{ CI} - 50\%$$

$$= 5\%$$

Cost of 16% debt $(K_{d2}) = \text{Interest Rate} (1 - \text{Tax rate})$

$$= 16\% \text{ CI} - 50\%$$

$$= 8\%$$

Average cost of debt $(K_d) = \frac{5\% \times 2 + 8\% \times 2}{4}$ (no equal weight so simple average)

$$= 5.5\%$$
 (So →)

$$= \frac{5\% \times 1,80,000}{3,00,000} + \frac{8\% \times 1,20,000}{3,00,000}$$

$$= 6.20\%$$

(c) Soln:-

Cost of Equity $(K_e) = \frac{D_1}{P_0} + g$

Calculation of expected dividend (D_1)

DP ratio = $\frac{DPS}{EPS}$

$$0.50 = \frac{DPS}{4}$$

$DPS (D_1) = \text{Rs } 2 \text{ per share.}$

Now, $K_e = \frac{D_1 (1+g)}{P_0} + g$

$$= \frac{2 (1+10\%)}{44} + 0.10$$

$$= 15\%$$

Since there is no flotation cost, no personal income tax of shareholders and no brokerage charge payable by shareholders in purchasing another company's share.
 $K_e = K_{re} = 15\%$

(d) Soln:-

Calculation of WACC

Sources	Amount	Weight (a)	Cost (b)	(a) x (b)
10% Debt	1,80,000	0.18	6.20%	1.86
16% Debt	1,20,000	0.12		
Ret. Earnings	2,10,000	0.21	15%	3.15
Equity shares	4,90,000	0.49	15%	7.35
	10,00,000	1.00		12.36

00
Qno55 (a) Soln:-

Amount of additional fund = Rs 30 million
 Present capital structure Ratio (Debt: Equity) = $\frac{\text{Debt}}{\text{Equity}}$
 $= \frac{30 \text{ million}}{30 \text{ million}}$
 $= 1:1$

So,
 Amount of equity component for additional fund is = $30 \text{ million} \times \frac{1}{2}$
 $= 15 \text{ million}$

(b) Soln:-

Retained earnings is the internally generated funds;
 So, amount of retained earnings available for investment = Rs. 3 million

(c) Soln:-

Cost of each of the common equity components:-

(i) Cost of retained earnings:
 $k_{re} = \frac{D_1}{P_0} + g$
 $= \frac{1.20}{30} + 0.08$
 $= 12\%$

(b) Soln:-

Post tax average cost of debt:-
 $(\text{Cost of } 10\% \text{ debt } (K_d)) = \text{Interest Rate } (1 - \text{tax rate})$
 $= 10\% (1 - 50\%)$
 $= 5\%$

Cost of 16% debt $(K_d) = \text{Interest rate } (1 - \text{tax rate})$
 $= 16\% (1 - 50\%)$

Average cost of capital

(ii) Cost of equity (k_e)

$k_e = \frac{D_1}{N_p} + g$
 $= \frac{1.20}{27} + 0.08$
 $= 12.44\%$

(d) Soln:-

(Component)
 WACC increases when low cost bearing fund (i.e. Retained earnings) finishes and any additional fund should be raised from high cost bearing component of equity (i.e. Fresh equity), the point beyond which the WACC starts increasing is called breaking points.

1st Breaking point = $\frac{\text{Amount of Retained earning}}{\text{It's weight}}$
 $= \frac{3 \text{ million}}{0.5}$
 $= 6 \text{ million.}$

(e) Soln:-

First breaking point = $\frac{3 \text{ million}}{0.5} = \text{Rs } 6 \text{ million}$

Second breaking point = $\frac{30 \text{ million}}{50\%} = \text{Rs } 60 \text{ million}$

28:35
1:3

Calculation of WACC
 1st Breaking point = Rs 6 million
 Fund already raised = Nil
 Balance Fund = 6 million

Source	Amount	Weight (a)	Cost (b)	(a) X (b)
8% Debt	3 million	0.50	4.80%	2.40%
Ret. Earning	3 million	0.50	12%	6%
	6 million		WACC	8.40%

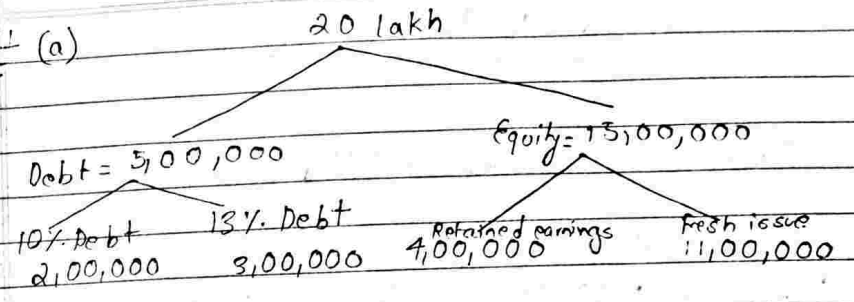
Calculation of WMCC
 2nd Breaking point = 30 million
 Fund already raised = 6 million
 Balance Fund = 24 million

Source	Amount	Weight (a)	Cost (b)	(a) X (b)
8% Debt	12 million	0.50	4.80%	2.40%
Fresh	12 million	0.50	12.44%	6.22%
	24 million		WACC	8.62

(c) Calculation of WACC

Source	Amount	Weight (a)	Cost (b)	(a) X (b)
8% Debt	15 million	0.5	4.80%	2.4%
Retained Earning	3 million	0.1	12%	1.2%
Fresh	12 million	0.4	12.44%	4.976%
	30		WACC	8.576%

Don't
 Q no 5L (a)



(b)(i) Calculation of post-tax average cost of additional debt.

Cost of debt (k_{d1}) = Interest (1 - tax rate)
 $= 10\% (1 - 30\%)$
 $= 7\%$

Cost of debt (k_{d2}) = Interest (1 - tax rate)
 $= 13\% (1 - 30\%)$
 $= 9.10$

Average cost of debt = $7\% \times \frac{2,00,000}{5,00,000} + 9.10 \times \frac{3,00,000}{5,00,000}$
 $= 8.26\%$

(iii) Calculation of cost of retained earnings and cost of equity

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

$= \frac{60(1+10\%)}{60} + 10\% = \frac{66(1+10\%)}{60} + 10\%$

$= 21\%$

Dividend payout ratio = $\frac{DPS}{EPS} \times 100\%$

$0.50 = \frac{DPS}{12} \times 100\%$

$6 = DPS$

$$k_{re} = k_d (1 - t)$$

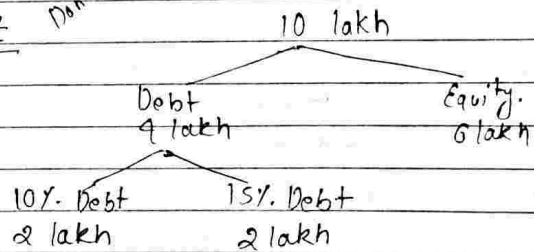
$$= 21\% (1 - 20\%)$$

$$= 16.80\%$$

(iii) Calculation of overall weighted average cost of additional finance

Source	Amount	Weight (a)	Cost (b)	(a) X (b)
Equity share cap	11,00,000	0.55	21.000%	11.55%
Retained earnings	4,00,000	0.20	16.800%	3.36%
Debt	5,00,000	0.25	8.260%	2.07%
Total		WACC		16.98%

Q no 52 Debt



(i) Cost of equity

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

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

$$= \frac{D_0(1+8\%)}{40} + 8\% = \frac{1(1+8\%)}{40} + 8\%$$

Dividend payout ratio = $\frac{DPS}{EPS} \times 100\% = 10.70\%$

$$25\% = \frac{DPS}{4} \times 100\%$$

$$L = DPS$$

(ii) Cost of debt

$$(k_{d1}) = \text{Interest} (1 - \text{tax rate}) = 10(1 - 30\%) = 7\%$$

$$k_{d2} = \text{Interest} (1 - \text{tax rate}) = 15(1 - 30\%) = 10.50\%$$

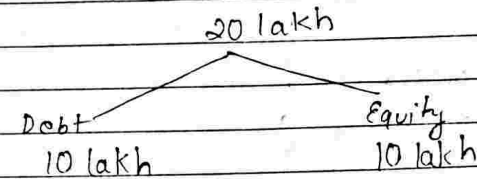
$$\text{Average} = 7\% \times \frac{2}{4} + 10.50\% \times \frac{2}{4}$$

$$= 8.75\%$$

Calculation of overall weight cost of additional fund

Source	Amt	Weight (a)	Cost (b)	(a) X (b)
Equity share cap	600,000	0.60	10.70%	6.42%
Debt	400,000	0.40	8.750%	3.50%
Total	1,000,000		WACC	9.92%

Q no 53



Source	Amount	Weight (a)	Cost (b)	(a) X (b)
Equity	10,00,000	0.50	20.50%	10.25%
Debt	10,00,000	0.50	9.10%	4.55%
Total	20,00,000	1.00	WACC	14.80%

(i) Cost of equity

$$k_e = \frac{D_1}{P_0} + g = \frac{4}{45(5-3)} + 8\%$$

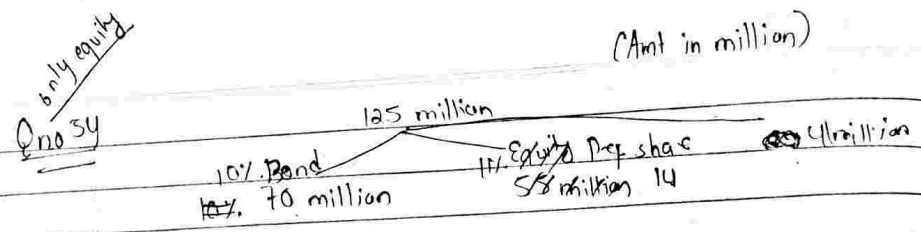
$$= 18.75\% + 8\% = 26.75\%$$

Cost of debt

$$k_d = \text{Interest} (1 - \text{tax})$$

$$= 14(1 - 0.35)$$

$$= 9.10$$



Sources	Amount	Weight (a)	Cost (b)	(a) x (b)
Retained Earnings	41	0.328	14%	4.592%
Pref share capital	14	0.112	11%	1.232%
Bond	70	0.56	6%	3.36%
	125	1	WACC	9.184%

(a) Cost of bond

$$k_d = \text{Interest} (1 - \text{tax})$$

$$= 10\% (1 - 40\%)$$

$$= 6\%$$

(b) Pref share = $\frac{\text{Interest Pref share} \times 100}{\text{Net proceeds}}$ (No ans) (ok, its cost so same)

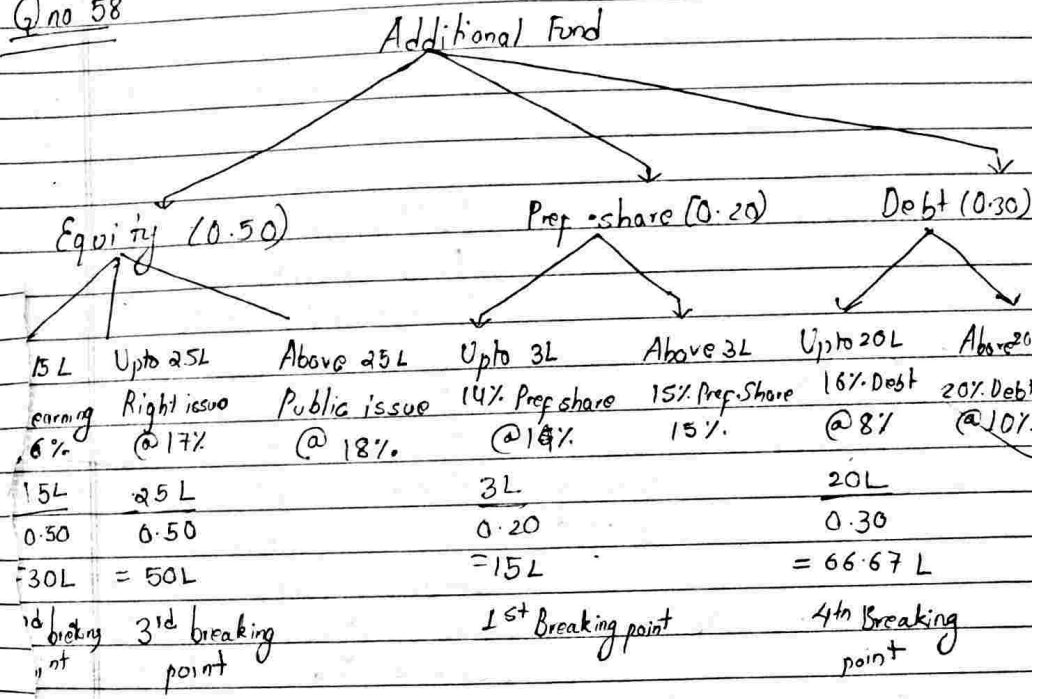
(c) Cost of equity (retained earnings)

$$\text{Cost of equity (Ke)} = \frac{D_1}{P_0} + g$$

$$= \frac{2}{25} + 6\%$$

$$= 14\%$$

Q no 58



Soln:-

Computation of Breaking point:-

- Exhaustion of Retained Earnings
 - = $\frac{15,00,000}{0.50} = \text{Rs } 30,00,000$ 2nd Breaking point
- Exhaustion of Right Issue
 - = $\frac{25,00,000}{0.50} = \text{Rs } 50,00,000$ 3rd Breaking point
- Exhaustion of 14% of Pref shares
 - = $\frac{3,00,000}{0.20} = \text{Rs } 15,00,000$ 1st Breaking point

Total लिडु पने 15 So $\frac{15}{100} \times 50 = 7.5$
 30 $\frac{15}{100} \times 20 = 3,00,000$
 $\frac{15}{100} \times 30 = 4,50,000$

(4) Exhaustion of 16% Debt

$\frac{20,00,000}{0.30} = \text{Rs } 66,66,667$ 4th Breaking Point

Calculation of WACC [1st breaking point = 15,00,000]
 Fund already raised = -
 Balance fund = Rs 15,00,000

Sources	Amount	Weight (a)	Cost (b)	(a) x (b)
Equity (Ret. Earnings)	7,50,000	0.50	16%	8%
Pref. Share	3,00,000	0.20	14%	2.80%
Debt	4,50,000	0.30	8%	2.40%
	15,00,000		WACC	13.20%

Calculation of WACC [2nd Breaking Point = 30,00,000]
 Fund already raised = 15,00,000
 Balance fund = 15,00,000

Sources	Amount	Weight (a)	Cost (b)	(a) x (b)
Equity (Ret. Earnings)	7,50,000	0.50	16%	8%
15% Pref. Share	3,00,000	0.20	15%	3%
16% Debt	4,50,000	0.30	8%	2.40%
	15,00,000		WACC	13.40%

Calculation of WACC [3rd Breaking Point = 50,00,000]
 Fund already raised = 30,00,000
 Balance fund = 20,00,000

Source	Amount	Weight (a)	Cost (b)	(a) x (b)
Equity (Right Issue)	10,00,000	0.50	17%	8.5%
15% Pref. share	4,00,000	0.20	15%	3%
16% Debt	6,00,000	0.30	8%	2.40%
	20,00,000		WACC	13.9%

Calculation of WACC [4th Breaking point = 66,66,667]
 Fund Already raised = 50,00,000
 Balance Fund = Rs 16,66,667

Source	Amount	Weight (a)	Cost (b)	(a) x (b)
Equity	8,33,333	0.50	18%	9%
15% Pref. share	3,33,333	0.20	15%	3%
16% Debt	5,00,000	0.30	8%	2.40%
			WACC	14.40%

Calculation of WACC [5th Breaking point = Not necessary]
 Fund Already raised = 66.67 lakh
 Balance fund = Above 66.67 lakh

Source	Amount	Weight (a)	Cost (b)	(a) x (b)
Equity (Fresh Issued)		0.50	18%	9%
15% Pref. Share		0.20	15%	3%
20% Debt		0.30	10%	3%
			WACC	15%

$\frac{50 \times 15.6\%}{50 - 30}$

Qno 56 Calculation of weighted average cost of capital
At market value weight (In million)

Sources	Amount	Weight(a)	Cost(b)	(a)X(b)
Equity share capital	5003600	0.325	8.47%	2.75453
Reserve and surplus	2505400	0.488	8.47%	4.133
10.5% preference share	100	0.009	10.972%	0.099
9.5% Debenture	15001471.575	0.133	6.872%	0.913
8.5% Term loan	500 500	0.045	5.525%	0.250
Total	141071.575		WACC	8.148

W.N.1 Calculation of amount of market value

$$\text{Equity} = 150 \text{ million} \times 60 \times \frac{1500}{3750} = 3600$$

$$\text{Reserve} = \frac{150 \times 100 \times 2250}{3750} = 5400$$

$$\text{Pref} = 1 \times 98.15 = 98.15$$

$$\text{Debenture} = 15 \times 981.05 = 1471.575$$

W.N.2 Calculation of cost of debenture (Kd)

$$K_d = \frac{\text{Interest} (1 - \text{Tax Rate}) + \frac{RV - NP}{N}}{\frac{RV + NP}{2}}$$

$$1000 \times 9.5\% = 95 = \frac{95 (1 - 0.35) + \frac{1000 - 981.05}{2}}{\frac{1000 + 981.05}{2}}$$

$$150 \times 9.5\% = 9.5 = \frac{6.175 + \frac{9.475 \times 6.31}{2}}{990.526} = 15.65$$

$$+ 2611 = 6.872\%$$

3 Calculation of cost of pref share.

$$\text{Cost of preference share } (k_p) = \frac{\text{Dividend} + \frac{RV - NP}{N}}{\frac{RV + NP}{2}}$$

$$= \frac{10.50 + \frac{100 - 98.15}{2}}{\frac{100 + 98.15}{2}} = 10.972\%$$

4 Calculation of cost of equity (Ke).

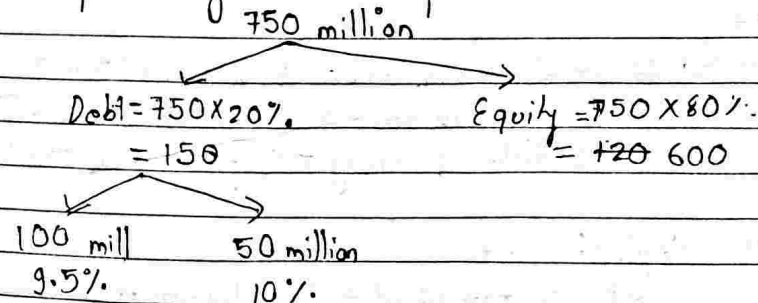
As per CAPM

$$k_p = R_f + B(R_m - R_f) = 5.5\% + 1.1875(8\% - 5.5\%) = 8.46875\%$$

Since no flotation cost then $k_e = k_{re} = 8.47\%$

5 For term loan = $8.5\% (1 - 0.35) = 5.525\%$

(ii) Pattern of Raising additional fund



Computation of Marginal cost of capital

Sources	Amount	Weight(a)	Cost(b)	(a)X(b)
Debt	150	0.2	17.00%	13.600%
Equity	600	0.8	7.15%	1.430%
	750	1	WACC	15.030%

Calculation of cost of debt

$$= \frac{9.5\% \times 150}{750} + \frac{10\% \times 50}{750}$$

$$kd_1 = \text{Interest} (1 - \text{tax rate})$$

$$= 9.5\% (1 - 35\%)$$

$$= 6.175\%$$

$$kd_2 = \text{Interest} (1 - \text{tax rate})$$

$$= 10\% (1 - 35\%)$$

$$= 6.50\%$$

$$\text{Average } kd = \frac{6.175\% \times 100}{150} + \frac{6.50\% \times 50}{150}$$

$$= 7.15\%$$

Calculation of cost of Equity (k_e)

As per CAPM

$$k_e = R_f + B(R_m - R_f)$$

$$= 5.50\% + 8\% \times 1.4375$$

$$= 17\%$$

Qno 57

- (a) # long term debt 30 million \times 50% = 15 million
 # Preference share = 10% of 30 million = 3 million
 # Retained earnings + Equity = 40% of 30 million = 12 million

(a) Explicit cost

$$\text{Cost of equity debt} = \frac{\text{Interest} (1 - \text{tax rate})}{RV + NP} + \frac{RV - NP}{n}$$

$$= \frac{120(1 - 40\%)}{1000 + 980} + \frac{1000 - 980}{7}$$

$$= \frac{72}{990} + \frac{20}{7}$$

$$= 7.2\% + 2.8571\%$$

$$= 10.0571\%$$

Computation of WACC

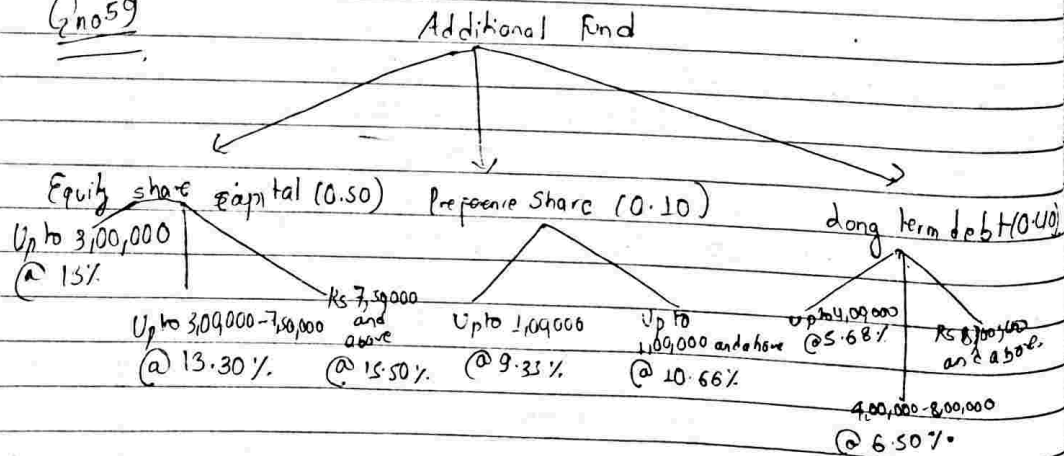
① Exhaustion of Retained Earnings

Sources	Amount	Weight(a)	Cost(b)	(a) X (b)
Retained Earnings	10,000,000	0.40	15.60%	6.240%
Pref. share capital	2500,000	0.10	10.53%	1.053%
12% Debenture	13,500,000	0.50	7.56%	3.780%
Total	25,000,000		WACC	11.073%

② Balance Funds

Sources	Amount	Weight(a)	Cost(b)	(a) X (b)
Equity share capital	2,000,000	0.40	16.60%	6.640%
Prof. share capital	5,00,000	0.10	10.53%	1.053%
12% Debenture	2500,000	0.50	7.56%	3.780%
Total	5,000,000.00		WACC	11.473%

Qno 59



Computation of Breaking Point

① 1st Breaking Point

$$\text{Exhaustion of } 13\% \text{ Equity share} = \frac{3,00,000}{0.50} = 6,00,000$$

② Exhaustion of ^{9.33%} Preference share = $\frac{1,00,000}{0.10} = 10,00,000$

③ Exhaustion of ^{10.66%} long term debt = $\frac{4,00,000}{0.40} = 10,00,000$

④ Exhaustion of ^{16.60%} Equity share capital = $\frac{7,50,000}{0.50} = 15,00,000$

⑤ Exhaustion of ^{6.50%} long term debt = $\frac{8,00,000}{0.40} = 20,00,000$

Computation of WACC of 1st Breaking Point

Sources	Amount	Weight(a)	Cost(b)	(a) X (b)
Retain Equity	3,00,000	0.50	13%	6.50%
Prof. share	60,000	0.10	9.33%	0.933%
long term debt	2,40,000	0.40	5.68%	2.27%
	6,00,000		WACC	9.71%

1st breaking point = 6,00,000
 Fund already raised = -
 Balance fund = 6,00,000

Computation of WACC (2nd Breaking Point) $\left\{ \begin{array}{l} \text{2nd breaking point} = 10,00,000 \\ \text{Fund already raised} = 6,00,000 \\ \text{Balance fund} = 4,00,000 \end{array} \right.$

Sources	Amount	Weight (a)	Cost (b)	(a) X (b)
Equity share capital	2,00,000	0.50	13.30%	6.65%
Prep. share	40,000	0.10	9.33%	0.93%
Long term debt	18,00,000	0.40	5.68%	2.27%
	10,00,000	4,00,000		9.86%

Computation of WACC (3rd Breaking Point) $\left\{ \begin{array}{l} \text{3rd Breaking point} = 15,00,000 \\ \text{Fund Already raised} = 10,00,000 \\ \text{Balance fund} = 5,00,000 \end{array} \right.$

Sources	Amount	Weight (a)	Cost (b)	(a) X (b)
Equity share capital	2,50,000	0.50	13.30%	6.65%
Prep. share	50,000	0.10	10.66%	1.07%
Long term debt	2,00,000	0.40	6.50%	2.60%
	5,00,000		WACC	10.32%

Computation of WACC (4th Breaking point) $\left\{ \begin{array}{l} \text{4th Breaking point} = 20,00,000 \\ \text{Fund Already Raised} = 15,00,000 \\ \text{Balance fund} = 5,00,000 \end{array} \right.$

Sources	Amount	Weight (a)	Cost (b)	(a) X (b)
Equity share capital	2,50,000	0.50	15.50%	7.75%
Prep. share	50,000	0.10	10.66%	1.07%
Long term debt	2,00,000	0.40	6.50%	2.60%
	5,00,000		WACC	11.42%

Financial Statement analysis

Ratio Analysis

CFS

Ratio Analysis

→ BIS

→ Income statement

→ Market Based Ratios.

(1) Financial Statement.

Financial Statements are the set of collection of organized financial data based upon logical and consistent accounting principles. Example:- Balance Sheet (Statement of Financial Position), Income Statement (Statement of Comprehensive Income), Cash Flow Statement, Changes in equity, Notes to Accounts.

(2) Financial Statement Analysis

The analysis of different financial figures appearing in financial statement. The main tools of financial statement analysis are:- Ratio Analysis and Cash Flow Analysis. In this part Ratio Analysis is discussed.

(3) Types of Financial Statement Analysis

(i) Comparative Financial Statement Analysis

(or)
Horizontal Analysis

→ The comparison of financial statement of current year with one or more previous year's financial statement is called horizontal analysis. It is conducted by setting consecutive balance sheet, income statement, cash flow statement side by side and analysing changes in individual head on year to year basis.

Example:- Sales increase from past year to current year, net profit for the current year is compared to past year.

(ii) Common size financial statement analysis OR Vehicle analysis OR cross-sectional analysis

→ This involves the analysis of different figures of financial statement within same year. The vehicle analysis represents the relationship of different items of financial statements by taking some common item and expressing each item as a percentage of the common item. It involves analysis of relationship between various items in the statement of one year.

Example:- Percentage of current assets on total assets
Percentage of current liabilities on total liabilities
Percentage of variable cost on total sales etc.

(iii) Index Ratio/Index Analysis

Particulars	2074-75		2073-74		2072-73	
	Index	Value	Index	Value	Index	Value
Sales	250	Rs 1250	200	Rs 1000	150	Rs 500
Expenses	30	Rs 900	150	Rs 450	100	Rs 300

(iv) Ratio Analysis

Ratio Analysis is the process of identifying the financial strength and weakness of enterprise by logically establishing the relationship between the items of balance sheet or income statement or both and interpreting the results thereof.

Objectives of Ratio-Analysis

- To identify the financial position and economic performance of an entity.
- To identify the strength and weakness of an entity in terms of economic performance, financial position and different components of financial statements.
- It helps in comparison. Comparison can be

⇒ Intra-Firm Comparison

Comparison of components of financial statements within the same business entity.

⇒ Inter-Firm Comparison

Comparison with another entity within the same industry.

- Ratio analysis are categorized to six different categories

- 1) Liquidity ratio or short term solvency ratio.
- 2) Capital structure ratio / leverage ratio
- 3) Activity Ratio / Turnover ratio / Assets Mgmt. Ratio / Performance Ratio
- 4) Operating Ratio
- 5) Profitability ratio.
- 6) Market based ratios

① liquidity ratios

It measures the firm's ability to repay its current liabilities or short term maturing liabilities and its ability to meet the other operating expenses.

It also measures whether the firm's current assets are sufficient or not to meet its current liabilities. These ratio helps to identify the short term solvency of an entity.

The different types of liquidity ratios are:-

(a) Current ratio / Working capital ratio

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

It measures whether the business can pay its short term debt and meet its operating expenses. The standard ratio is 2:1. where,

$$\begin{aligned} \text{Current assets} = & \text{Cash balance} + \text{Bank balance} + \\ & \text{Debtors (After deducting provision for} \\ & \text{doubtful debt)} + \text{Bills receivable} + \text{Marketable} \\ & \text{securities (Realizable value)} + \text{Inventory of raw material} \\ & + \text{Inventory of WIP} + \text{Inventory of finished goods} + \\ & \text{Prepaid expenses} + \text{Short term loans and advances} + \\ & \text{Accrued income} + \text{Advance tax etc.} \end{aligned}$$

Note:- Unless otherwise stated, it is assumed that debtors / B/R and Marketable securities are realizable at their book values.

Note:- Current assets are the assets which can be converted into cash or cash equivalent within the period of 12 months.

where Current liabilities = (creditors for goods (trade payables), bills payable, creditors for expenses. (eg:- O/S expenses), Bank overdraft, Provision for tax, Unclaimed dividend, Dividend payable, income received in advance, Cash Credit etc.

Note:- Current liabilities are the liabilities which are to be repaid within the period of 12 months.

(b) Quick ratio / Acid-Test Ratio / Liquid ratio

× (Inventory and Prepaid expenses)*

$$\text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Current liabilities}} = \frac{\text{Current Assets} - \text{Inventory} - \text{Prepaid expenses}}{\text{Current liabilities}}$$

OR

$$\text{Quick ratio} = \frac{\text{Current Assets} - \text{Inventory} - \text{Prepaid Expenses}}{\text{Current liabilities} - \text{Bank OD} - \text{Cash Credit}}$$

It measures the ability to meet current liabilities immediately, the standard ratio is 1:1.

(c) Cash ratio / Absolute liquidity ratio / Super-quick ratio

$$\text{Cash ratio} = \frac{\text{Cash and cash equivalents}}{\text{Current liabilities}}$$

It measures absolute liquidity of the business.

(d) Defensive interval ratio / Cash interval ratio

$$= \frac{\text{Cash and Cash Equivalent} + \text{Receivables} / \text{Debtors}}{\text{Projected daily cash expenses}}$$

$$\text{Projected daily cash expenses} = \frac{\text{Projected cash expenses for a year}}{360}$$

It measures the ability of the business to meet its regular cash expenses although the business is not in operations due to some reason like strike.

(2) Capital Structure Ratio OR Leverage Ratio:-

(I) Capital Structure Ratio

Long term loan providers are primarily interested into the long term solvency of the firm and the firm's ability to meet their claims. Long term solvency means the ability of the enterprises to meet the obligation for the long term fund.

Following are the different capital structure ratios:-

(a) Equity Ratio

It indicates owner's fund invested into the company out of total fund invested.

$$\text{Equity Ratio} = \frac{\text{Equity shareholder's fund}}{\text{Capital employed}}$$

Note 1:- Equity share holder's fund = Paid up equity share capital +
 [Reserve and Surplus - Miscellaneous Expenditure
 (Excluding revaluation reserve)]

Note 2:- Capital employed = Paid up capital + R & S + Paid up
 Pref. share capital + long term Debt - Misc Expenditure
 - Non-Trade Assets

Note 3:- Reserve and surplus includes:-

General reserve, Profit and loss (Cr balance), capital redemption reserve, debenture redemption reserve, investment allowance reserve, capital reserve, securities premium, revaluation reserve etc.

Note 4:- Remember that revaluation reserve is included

while calculating capital employed and excluded while calculating equity shareholder's fund.

Note 5:- Non trade assets means the idle assets which do not generate any revenue. Example:- Interest free security deposits, capital WIP, Advances for capital equipments, loans on advance, interest free long term, intangible assets.

Note 6:- Misleading expenditure means fictitious assets such as preliminary expenses, discount on issue of securities, profit and loss (Dr).

(b) Debt Ratio

$$= \frac{\text{Debt}}{\text{Capital Employed}}$$

It indicates the proportion of outsiders fund to total funds invested in the company.

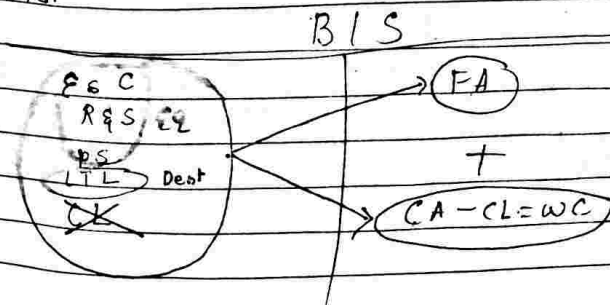
(c) Debt equity Ratio

$$= \frac{\text{Debt}}{\text{Equity}}$$

→ Outsiders Fund
→ Insiders "

(Include PSE)

It indicates the ratio of outsiders fund and owner's fund.



Capital Employed = Fixed Assets + Working Capital
 Capital Employed = Debt + Equity (if debt-equity ratio is given)

(d) Debt to total assets ratio / Debt to value ratio

$$= \frac{\text{Debt}}{\text{Total Assets}}$$

where total assets excludes miscellaneous expenditure and non-trade assets.

(e) Capital-bearing ratios
 It shows the portion of fixed claim bearing fund to equity shareholder's fund.

$$= \frac{\text{Fixed claim bearing fund}}{\text{Eq. shareholder's fund}}$$

$$= \frac{\text{Long term debt + Prefe. Shares}}{\text{Eq. shareholder's fund}}$$

(f) Fixed assets ratio

$$= \frac{\text{Fixed assets}}{\text{Capital employed}}$$

(g) Proprietary ratio
 It measures the proportion of total assets financed by shareholders.

$$= \frac{\text{Net Worth}}{\text{Total Assets}}$$

where net worth = Total Assets - External liabilities

(II) Coverage Ratio

These ratios provide assurance to long term fund providers such as equity shareholder, preference shareholder, debenture holder. Different coverage ratios are:-

(a) Debt service coverage ratio

It measures the ability to meet the commitment of various debt services such as interest and installments.

$$= \frac{\text{EBIT} - \text{Tax} + \text{Dep}^n}{\text{Interest} + \text{Installment}}$$

Also,
$$= \frac{\text{EAT} + \text{Dep}^n + \text{Interest}}{\text{Interest} + \text{Installment}}$$

Note:- Non-operating income and expenses should not be considered while calculating coverage ratio.

(b) Interest coverage ratio

It measures the ability of the business to pay its interest expenses. The ratio greater than 1 is acceptable.

$$\text{Interest coverage ratio} = \frac{\text{EBIT} + \text{Dep}^n}{\text{Dep}^n + \text{Interest}}$$

$$= \frac{\text{EBIT}}{\text{Interest}}$$

(c) Dividend coverage ratio

(i) Pref. dividend coverage ratio

It measures the ability of the firm to pay preference dividend. Ideal ratio is greater than 1.

$$= \frac{\text{EAT}}{\text{Pref. dividend}}$$

(ii) Equity dividend coverage ratio

It measures the ability of the firm to pay equity dividend. Idle ratio is greater than 1.

$$= \frac{EAE}{\text{Equity dividend}}$$

(iii) Assets Management Ratio / Activity Ratio / Turnover Ratio / Performance Ratio

(a) Capital turnover ratio

It measures the firm's ability to utilize its capital efficiently and effectively to generate sales revenue.

$$\text{Capital turnover ratio} = \frac{\text{Net sales}}{\text{Average capital employed}}$$

$$\text{where, average Capital} = \frac{\text{Opening Capital} + \text{Closing Capital}}{2}$$

(b) Fixed assets turnover ratio

$$= \frac{\text{Net Sales}}{\text{Average fixed Assets}}$$

It measures the efficiency of the firm to utilize its fixed assets effectively and efficiently to generate sales revenue.

(c) Total assets turnover ratio

It measures the efficiency of the firm to utilize its fixed assets effectively and efficiently in generating sales revenue.

$$= \frac{\text{Net Sales}}{\text{Avg Total Assets}}$$

(d) Working capital turnover ratios

$$= \frac{\text{Net Sales}}{\text{Average Working Capital}}$$

Following are the different types of working capital turnover ratios.

Inventory Turnover ratio

(Case I) In case of inventory of raw material

$$= \frac{\text{Raw material consumed}}{\text{Avg. Inventory of Raw Material}}$$

(Case II) In case of inventory of finished goods.

$$= \frac{\text{Cost of Goods Sold (COGS)}}{\text{Avg. Inventory of finished goods}}$$

Note:- In case of inventory of finished goods, turnover ratio is always calculated on :-

- COGS (First Priority)
- Cost of sales (If COGS is not given)
- Net Sales (If COGS and cost of sales is not given)

Debtors turnover ratio / Receivable turnover ratio / Debtors Velocity.

$$= \frac{\text{Net Credit Sales}}{\text{Avg debtors}}$$

While calculating debtor turnover ratio, bills receivable is also taken into care.

Note:- Debtors collection period / Days Sales Outstanding (DSO)

$$= \frac{\text{Avg Debtor / Receivables} \times 360}{\text{Net Credit Sales}}$$

$$= \frac{1}{\frac{\text{Net Credit Sales}}{\text{Avg Debtor}}} \times 360$$

$$= \frac{1}{\text{Debtor T/O}} \times 360 \text{ days}$$

$$= \frac{360}{152/112}$$

Debtors TO Ratio

Note:- Debtors Velocity can either be expressed in 'days' or 'times'. If it is expressed in days then it is debtors collection period. If it is expressed in times then it is debtors turnover ratio.

Creditors turnover ratio /

$$= \frac{\text{Net Credit purchase}}{\text{Avg. Creditors}}$$

While calculating creditors turnover ratio, bills payable is also taken into care.

Note:-

Creditors payment period

$$= \frac{\text{Avg creditors payable} \times 360 \text{ days}}{\text{Net credit purchase}}$$

$$= \frac{1}{\frac{\text{Net Credit Purchase}}{\text{Avg Creditors}}} \times 360$$

$$= \frac{1}{\text{Creditors Turnover Ratio}} \times 360 \text{ days}$$

$$\text{Adjusted Purchase} = \text{Purchase} - \text{closing stock}$$

$$= \frac{360}{152/112}$$

Creditors Turnover Ratio

Note:- All turnover ratios are treated as 'higher the better' except creditors turnover ratio which is considered to be lower the better.

IV Operating Ratio.

Operating Ratios are the ratios of the expenses to sales. Most ratios are always expressed in terms of sales.

(a) Material cost ratio

$$= \frac{\text{Material cost}}{\text{Net Sales}}$$

(b) Labour cost ratio

$$= \frac{\text{Labour cost}}{\text{Net sales}}$$

(c) Overhead cost ratio

$$= \frac{\text{Operat Overhead cost}}{\text{Net Sales}}$$

(d) Operating Profit Ratio

$$= \frac{\text{Operating Profit (EBIT)}}{\text{Net Sales}}$$

where operating profit = Net Sales - Operating expenses
 Also, = Net Profit + Non-operating exp - Net operating income. Non

(e) Operating Ratio = $\frac{\text{Operating expense}}{\text{Net Sales}}$

where operating expenses = COGS + Operating expense from P/L

(V) Profitability Ratios.

Return on capital employed (ROCE) or ROI (Return on investment)

$$= \frac{\text{EBIT (Operating Profit)}}{\text{Avg Capital employed}}$$

Net income = EAE

D.V X V.T. Ratio = 1

$$\text{(b) Return on equity (ROE)} \\ = \frac{\text{EAE}}{\text{Equity shareholders fund}} \times 100$$

$$\text{(c) Return on assets} \\ = \frac{\text{Net profit (EAT)}}{\text{Avg total assets}} \times 100\%$$

$$\text{(d) GP ratio} \\ = \frac{\text{Gross profit}}{\text{Net sales}} \times 100\%$$

$$\text{(e) PV ratio} \\ = \frac{\text{Contributions}}{\text{Sales}}$$

VI Market Based Ratios

$$\text{(a) EPS} \\ = \frac{\text{EAE}}{\text{No of equity shares}}$$

$$\text{(b) P/E ratio} \\ = \frac{\text{M.P.S}}{\text{E.P.S}}$$

$$\text{(c) Dividend per share (DPS)} \\ = \frac{\text{Total dividend}}{\text{No of equity shares}}$$

$$\text{(d) Dividend yield} \\ = \frac{\text{DPS}}{\text{MPS}}$$

$$\text{(e) Earning yield} \\ = \frac{\text{EPS}}{\text{MPS}}$$

$$\text{(g) Book value per share} \\ = \frac{\text{Paid up ES} + \text{R\&S} - \text{Misc. expenditure}}{\text{No of equity shares}} \\ = \frac{\text{Equity shareholders fund}}{\text{No of equity shares}}$$

Q no 1

Revenue = Rs 29261
 Net income = Rs 4,212
 Assets = 27,987

$$= \frac{\text{EAE}}{\text{equity Shareholders equity fund}} \times 100\% \\ = \frac{4212}{13572} \times 100\% \\ = 31.03\%$$

Q no 3 (i) Soln:-

$$\text{(i) Current Ratio} = \frac{\text{Current Assets}}{\text{Current liabilities}} \\ = \frac{10,00,000}{4,00,000} \\ = 2.50 : 1$$

$$\text{(ii) Quick Ratio} = \frac{\text{Quick Assets ie Current Assets} - \text{Bank OD}}{\text{Current liabilities} - \text{Inventory} - \text{Prepaid expenses}} \\ = \frac{10,00,000 - 6,00,000 - 0}{4,00,000 - 0} \\ = 1 : 1$$

(ii) Alternately

$$\begin{aligned} &= \frac{\text{Current assets} - \text{Inventory} - \text{Prepaid expenses}}{\text{Current liabilities} - \text{Bank O.D} - \text{Cash credit}} \\ &= \frac{10,00,000 - 6,00,000 - 6}{4,00,000 - 20,000} \\ &= 1.05 : 1 \end{aligned}$$

$$\begin{aligned} \text{(iii) Absolute liquidity ratio} &= \frac{\text{Cash and cash equivalent}}{\text{Current liability}} \\ &= \frac{2,20,000}{4,00,000} \\ &= 0.55 : 1 \end{aligned}$$

$$\begin{aligned} \text{(iv) Ratio of inventory to working capital} &= \frac{\text{Inventory}}{\text{Working capital}} \\ &= \frac{6,00,000}{6,00,000} \end{aligned}$$

$$\begin{aligned} \text{(v) Ratio of current assets to fixed assets} &= \frac{\text{Current assets}}{\text{Fixed assets}} \\ &= \frac{10,00,000 \text{ (Goodwill) not considered}}{14,00,000} \\ &= 0.71 : 1 \end{aligned}$$

*because treated as non-current
Not encashed*

$$\begin{aligned} \text{(vi) Debt equity ratio} &= \frac{\text{Debt}}{\text{Equity}} \\ &= \frac{5,00,000}{20,00,000} \\ &= 1 : 5 \\ &= 0.25 : 1 \end{aligned}$$

$$\begin{aligned} \text{Net worth} &= \text{Total Assets} - \text{C.L} \\ &= (29-5) - 4 \\ &= 20 \end{aligned}$$

Date / /

$$\begin{aligned} \text{(vii) Proprietary ratio} &= \frac{\text{Net worth}}{\text{Total Assets}} \\ &= \frac{20,00,000}{24,00,000 \text{ (Exclude goodwill)}} \\ &= 0.83 : 1 \end{aligned}$$

$$\begin{aligned} \text{(viii) Capital gearing ratio} &= \frac{\text{Fixed claim bearing fund}}{\text{Long term debt + Pref share cap}} \\ &= \frac{5,00,000 + 5,00,000}{15,00,000} \\ &= 0.67 : 1 \end{aligned}$$

$$\begin{aligned} \text{(ix) Fixed assets ratio} &= \frac{\text{Fixed assets}}{\text{Capital employed}} \\ &= \frac{14,00,000}{20,00,000 \text{ (Include debenture)}} \\ &= 0.7 : 1 \end{aligned}$$

Q no 5

$$\begin{aligned} \text{(a) Inventory turnover ratio} &= \frac{\text{OCG}}{\text{Avg inventory}} \\ &= \frac{2867 + 2407}{2} \\ &= \frac{4170}{5274} \\ &= 7.91 \text{ times} \end{aligned}$$

$$\begin{aligned} \text{(b) Financial leverage} &= \frac{\text{EBIT}}{\text{EBT}} \\ &= \frac{170}{57} \\ &= 2.98 \text{ times.} \end{aligned}$$

$$\begin{aligned} \text{(c) Return on Investment (ROI)} &= \frac{\text{EBIT}}{\text{Avg Capital employed}} \times 100\% \\ &= \frac{170}{\frac{4555 + 5947}{2}} \end{aligned}$$

$$= 3.24\%$$

$$\begin{aligned} \text{(d) Return on Equity (ROE)} &= \frac{\text{PAT (EAE)}}{\text{Equity share holder's fund}} \times 100\% \\ &= \frac{34}{\frac{2577 + 1172}{2}} \times 100\% \\ &= 1.78\% \end{aligned}$$

$$\begin{aligned} \text{(e) Avg collection period} &= \frac{\text{Avg Debtors}}{\text{Net credit Sales}} \times 360 \text{ days} \\ \text{(Days sales 0/S)} &= \frac{1495 + 1168}{2} \times 360 \text{ days} \\ &= 22165 \\ &= 21.63 \text{ days} \end{aligned}$$

Q107

$$\begin{aligned} \text{M.P.S} &= \text{Rs } 54 \\ \text{P/E ratio} &= 9. \end{aligned}$$

$$\text{Earning per share} = \text{M.P.S}$$

$$\text{(i) P/E ratio} = \frac{\text{M.P.S}}{\text{EPS}}$$

$$9 = \frac{54}{\text{EPS}}$$

$$\text{Rs } 6 = \text{EPS}$$

$$\begin{aligned} \text{(ii) Net Income} &= 1,00,000 \times 6 \\ &= 6,00,000 \end{aligned}$$

$$\begin{aligned} \text{(iii) Dividend Yield} &= \frac{\text{D.P.S}}{\text{M.P.S}} \\ &= \frac{4.32}{54} \\ &= 8\% \end{aligned}$$

$$\begin{aligned} \text{(iv) ROE} &= \frac{\text{Net Income}}{\text{Capital}} \times \frac{\text{EAE}}{\text{Equity share holder's fund}} \\ &= \frac{6,00,000}{40,00,000} \end{aligned}$$

$$\text{Book value / share} = \frac{\text{ES} + \text{Reserve} - \text{M's Exp}}{\text{No. of shares}}$$

$$42 = \frac{\text{ES} + \text{F}}{100,000}$$

$$42,00,000$$

$$\therefore \text{ROE} = 14.28\%$$

Financial Leverage \Rightarrow Pref Dividends
 PSC \Rightarrow Overall BEP, Overall leverage.

Q no 8 Income Statement

Solⁿ:-

Particulars	Amt
Sales	7,50,000
(-) Variable cost	3,60,000
Contribution	3,90,000
(-) Operating fixed cost	90,000
EBIT	3,00,000
(-) Interest [4,00,000 \times 10%]	40,000
EBT	2,60,000
(-) Tax @ 30%	78,000
EAT	1,82,000

Given,

$$\text{Operating expenses} = 1.50 \times \text{EBIT}$$

$$\text{Variable cost} + \text{Operating fixed cost} = 1.50 \times 3,00,000$$

$$\text{Variable cost} = 4,50,000 - 90,000$$

$$\therefore \text{V.C} = 3,60,000$$

Assumption:- Depⁿ is only the fixed cost.

$$(i) \text{ Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

$$= \frac{3,90,000}{3,00,000}$$

$$= 1.3 \text{ times}$$

$$(ii) \text{ Financial leverage} = \frac{\text{EBIT}}{\text{EBT} - \frac{\text{Pref. Div.}}{(1-\text{tax})}}$$

$$= \frac{3,00,000}{2,60,000 - \frac{50,000}{(1-0.3)}}$$

$$= \frac{3,00,000}{2,60,000 - 50,000}$$

$$= \frac{3,00,000}{2,10,000}$$

$$= 1.43 \text{ times}$$

$$(ii) \text{ Pref Div Coverage ratio} = \frac{\text{EAT}}{\text{Pref. Div.}}$$

$$= \frac{1,82,000}{50,000}$$

$$= 3.64 \text{ times}$$

$$(ii) \text{ Equity dividend coverage ratio} = \frac{\text{EAT}}{\text{Equity Div}}$$

$$= \frac{1,82,000 - 50,000}{1,20,000}$$

$$= 1.10 \text{ times}$$

$$(iii) \text{ Earning yield} = \frac{\text{E.P.S}}{\text{Earnings available for equity}}$$

$$= \frac{1,82,000 - 50,000}{80,000}$$

$$= 1.65 \text{ per share}$$

$$\therefore \text{Earning yield} = \frac{\text{E.P.S}}{\text{M.P.S}} \times 100\%$$

$$= \frac{1.65}{20} \times 100\%$$

$$= 8.25\%$$

$$(iii) \text{ P/E ratio} = \frac{\text{MPS}}{\text{EPS}} \times 100$$

$$= \frac{20}{1.65} \times 100$$

$$= 12.12 \text{ times}$$

$$(iv) \text{ Net fund flow} = 1,82,000 - 1,20,000 - 50,000 + 30,000$$

$$= \text{EAT} - \text{Pref Div} - \text{Equity Dividend} + \text{Dep}^n$$

$$= 1,02,000$$

Note: - If No of equity shares are year, then adjusted no of shares is calculated

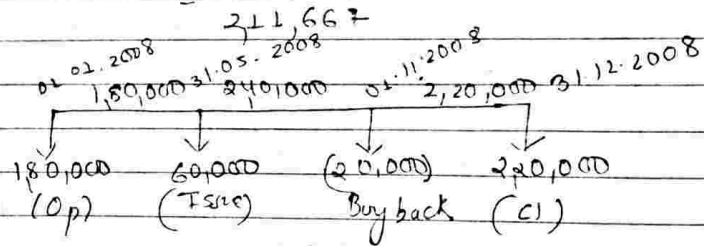
Q no 10
$$EPS = \frac{\text{Earnings available for eq. shares (EAE)}}{\text{No of equity shares}}$$

Earning available for equity shareholders = 21,00,000

$$= \frac{21,00,000}{2,00,000}$$

= Earnings available for eq. shares (EAE)
 Adjusted no of eq. shares

$$= \frac{21,00,000}{211,667}$$

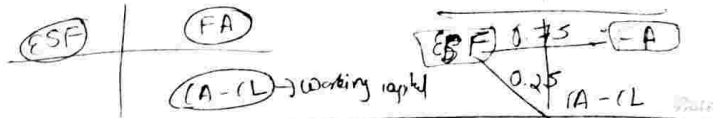


Adjusted no of eq. shares = $1,80,000 \times \frac{5}{12} + 2,40,000 \times \frac{5}{12}$

$$+ \frac{2,20,000 \times 2}{12}$$

$$= 2,11,667$$

→ 20,000 in bank
 → 20,000 itself



Q no 2 Capital WIP 'jat' expenses garga hali free ce veyen basya

Ratio of fixed assets to propriety fund = 0.75

Net working capital = Rs 6,00,000

$$\frac{FA}{\text{Propriety fund}} = 0.75$$

Propriety fund

Fixed assets = 0.75 X Propriety fund

Net working capital = 0.25 X Propriety fund

Fixed assets =

$6,00,000 = 0.25 \times \text{Propriety fund}$
 Propriety fund = 24,00,000

Total assets - Total liability = 6,00,000

∴ Fixed assets = 0.25 X Rs 24,00,000

= Rs 18,00,000

Propriety fund = Fixed Assets + Net working capital

Q no 11

(a) Soln:-

Calculation of capital employed - (Rs in lakh)

Particulars	31.03.2011	31.03.2010
Share capital ✓	300	300
(+) Debenture Redemption Reserve ✓	25	30
(+) Capital Subsidy from government ✓	30	30
(+) Revaluation reserve ✓	125	140
(+) General reserve ✓	160	120
(+) Balance in P & L A/C ✓	48	32
(+) Secured term loan ✓	275	295
(+) Unsecured Term loan ✓	123	117
(-) Term loan repayable within 12 months ✓	96	84
(-) Mis. expenditure ✓	96	102
(-) Capital WIP paid ✓	43	37
	26	16

Current Assets ma investment
 aayo vane ho marketable
 long term ma aayo vane less
 no trade vanyo vane less hunni
 trade vanyo vane less hunni
 keili pari vane vane less hunni

(-) Investments (Non-trade)	15	15
(-) Advance for capital equip ^t	24	17
Capital employed	829	830
Avg. Capital Employed =	Op. Capital Employed + Closing Cap. Employed	
	2	
	= $\frac{829 + 830}{2}$	
	= 829.50 lakh	

Note:- Unless otherwise stated:

- (a) Investment if prefixed with the word current/short term or if disclosed under the head current assets then it is treated as current assets and considered as trade investment.
- (b) Investment if shown separately or under the head long term assets and is not prefixed with the word trade, always assume it to be non-trade.
- (c) If nothing is prefixed with the word loans and advances assume it to be non-trade. / Operating vanyo vane trade
- (d) Advances for capital employed is non trade whether it is shown under the head current assets and non-current asset.

(c) Net Worth = Debt - Secured term loan + Unsecured - repayable within month equity

As at 31.3.2011

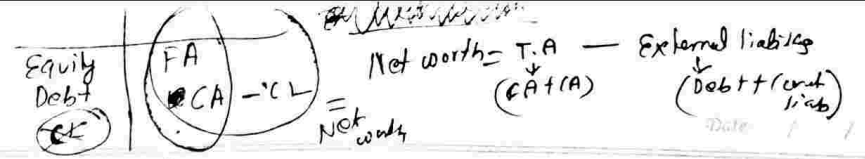
$$= 275 + 123 - 96$$

$$= 300 + 25 + 30 + 160 + 48 - 96$$

$$= 302$$

$$= \frac{563467}{0.536} \quad 64.66\%$$

$$= 53.69\%$$



Debt equity ratio = $\frac{295 + 117 - 84}{300 + 30 + 30 + 120 + 32 - 102}$

as at 31.3.2016 = $\frac{328}{410}$

= 80%

For 31.03.2011

Net Worth = $300 + 25 + 30 + 160 + 48 - 96$

=

For 31.03.20

Net = $300 + 30 + 30 + 120 + 32 - 102$

=

Qno 13 Soln:-

(i) Inventory Turnover ratio = $\frac{COGS}{\text{Avg inventory}}$

6 times = $\frac{2250,000}{\text{Avg inventory}}$

Avg inventory = 375,000



Calculation of COGS

= Sales - G.P

= 30,00,000 - 25% of 30,00,000

= Rs 22,50,000

(ii)

COGS = Op. Stock + Purchase - Cl Stock

22,50,000 = Purchase + (Op. Stock - Closing Stock)

22,50,000 = Purchase - 80,000

∴ Purchase = 23,30,000

(iii) Debtors Turnover ratio = $\frac{\text{Net Credit Sales}}{\text{Avg debtors}}$

8 times = $\frac{24,00,000}{\text{Avg debtors}}$

∴ Avg debtor = 3,00,000

Calculation of credit sales.

$$\begin{aligned} \text{Cash sales} + \text{Credit sales} &= \text{Total total} \\ 25\% \text{ of credit sales} + \text{Credit sales} &= 30,00,000 \\ \text{or, } 125\% \text{ credit sales} &= 30,00,000 \\ \therefore \text{Credit sales} &= 24,00,000 \end{aligned}$$

(ii) Avg credit sales

Net credit purchase

$$\text{Avg} \quad \frac{360}{\text{Creditors turnover ratio}}$$

$$\frac{360}{\text{Debtors turnover ratio}}$$

$$CA - CL = 2,80,000$$

$$\frac{CA}{CL} = 2.4$$

Qno 14

Imp

$$\text{Current ratio} = \frac{\text{Current Assets (CA)}}{\text{Current liabilities (CL)}}$$

$$2.5 = \frac{CA}{CL}$$

$$\text{or, } CA = 2.5 \times CL$$

Given,

$$\text{Working capital} = CA - CL$$

$$4,50,000 = 2.5CL - CL$$

$$\therefore CL = 3,00,000$$

$$\begin{aligned} \therefore \text{Current assets} &= 2.5 \times 3,00,000 \\ &= 7,50,000 \end{aligned}$$

Now,

$$\text{Total Fixed Assets turnover ratio} = \frac{\text{Net Sales}}{\text{Total Assets}}$$

$$2 = \frac{\text{Net Sales}}{\text{Fixed Assets} + \text{Current Assets}}$$

$$2 = \frac{\text{Net Sales}}{10,00,000 + 7,50,000}$$

$$\therefore \text{Net Sales} = 35,00,000$$

Gross profit ratio = 20%

$$\begin{aligned} \text{Cost of goods sold (COGS)} &= \text{Net sales} - \text{G.P} \\ &= 35,00,000 - 20\% \text{ } 35,00,000 \\ &= 28,00,000 \end{aligned}$$

$$\text{So, inventory T/O Ratio} = \frac{\text{COGS}}{\text{Avg Inventory}}$$

$$7 = \frac{28,00,000}{\text{Avg Inventory}}$$

Avg Inventory

$$\text{or Avg inventory} = 4,00,000$$

$$\text{Avg inventory} = \frac{\text{Open Inventory} + \text{Closing Inventory}}{2}$$

$$4,00,000 = \frac{380,000 + (\text{Closing Inventory})}{2}$$

$$4,20,000 = (\text{Closing Inventory})$$

$$\begin{aligned} \therefore \text{Quick ratio} &= \frac{\text{Current Assets} - \text{Inventory} - \text{Prepaid expenses}}{\text{Current liabilities}} \\ &= \frac{7,50,000 - 4,20,000 - \text{Prepaid expenses}}{\text{Current liability } 30,00,000} \\ &= 1.1:1 \end{aligned}$$

(ii) Fixed Assets Turnover Ratio

$$\begin{aligned} &= \frac{\text{Net Sales}}{\text{Avg fixed assets}} \\ &= \frac{35,00,000}{10,00,000} \\ &= 3.5 \text{ times} \end{aligned}$$

(iii) Proprietary Ratio

$$\begin{aligned} &= \frac{\text{Net Worth}}{\text{Total assets}} \\ &= \frac{\text{Net worth}}{17,50,000} = \frac{8,70,000}{17,50,000} = 0.49:1 \end{aligned}$$

$$\begin{aligned} \text{Net Worth} &= \text{Total assets} \\ &= \end{aligned}$$

$$\text{Debt equity ratio} = 1:0.5$$

$$\frac{\text{Debt}}{\text{Equity}} = \frac{1}{0.5} \quad \text{--- (1)}$$

Also, Capital employed = Fixed Assets + Net working capital

$$\begin{aligned} \text{Debt} + \text{Equity} &= \text{Fixed Assets} + \text{Net working capital} \\ \frac{\text{Equity} + \text{Equity}}{1.5} &= 10,00,000 + 4,50,000 \\ 2.5 \text{ Equity} &= 21,75,000 \end{aligned}$$

$$\therefore \text{Equity} = 8,70,000$$

2011
 Total EPS + PSC = 8,00,000
 Part of equity (i.e.)
 Equity + P.E.S + P.S.C =
 8,70,000
 which means there is
 R.E.S of Rs 70,000

(iv) Earnings per Share =

$$\text{Return of total assets} = \frac{\text{EAT}}{\text{Total assets}}$$

$$15\% = \frac{\text{EAT}}{17,50,000}$$

$$\text{EAT} = 2,62,500$$

$$\text{Now, EPS} = \frac{\text{EAT}}{\text{No. of Equity shareholders}} = \frac{2,62,500}{2,10,000} = 1.25$$

$$\begin{aligned} &= \frac{2,62,500 - 18,000}{2,10,000} = \frac{2,44,500}{2,10,000} = 1.164 \\ &= \frac{6,70,000}{60,000} = 11.16 \end{aligned}$$

2,10,000 x 9% = 18,000 P.Direkto.

$$\text{Equity shareholders fund} = 8,70,000 - 2,10,000 = 6,70,000$$

(v) Price Earning Ratio = $\frac{\text{M.P.S}}{\text{EPS}} \times \text{price}$

$$= \frac{16}{4.675} \times \text{price}$$

$$= 3.92 \text{ times}$$

Q no 27 Here,

(D.S.O) Debt Collection Period = $\frac{\text{Average Debt} \times 360}{\text{Sales}}$

$$40.55 = \frac{\text{A/C Receivable} \times 360}{100}$$

% Account receivable = ~~11.10~~ 11.10

(ii) Current Assets =

flex,

$$\text{Current ratio} = \frac{\text{CA}}{\text{CL}}$$

$$3.0 = \frac{\text{CA}}{10.55}$$

$$\text{Current assets} = 31.65$$

(iii) Total Assets

$$\begin{aligned} \text{Total Assets} &= \text{Fixed Assets} + \text{Current Assets} \\ &= 28.35 + 31.65 \\ &= 60 \end{aligned}$$

(iv) ROA

$$\begin{aligned} \text{Return on Assets} &= \frac{\text{EAT}}{\text{Total Assets}} \\ &= \frac{5}{60} \times 100\% \\ &= 8.33\% \end{aligned}$$

EAT = 5
Total Assets = 60

(v) Equity Shareholders fund

$$\begin{aligned} \text{ROE} &= \frac{\text{EAT}}{\text{Equity Shareholders fund}} \\ 12\% &= \frac{5}{\text{Equity Shareholders fund}} \end{aligned}$$

Net income = EAT = 5

(vi) Long term debt

$$\begin{aligned} &= \text{Total Assets} - \text{Current liabilities} - \text{Equity Shareholders fund} \\ &= 60 - 10.55 - 41.66 \\ &= 7.79 \end{aligned}$$

$$1.8 = \frac{\text{Current Assets}}{\text{Current liabilities}}$$

$$\begin{aligned} \frac{\text{C.A}}{60,000} &= 1.8 \\ \text{C.A} &= 10,80,000 \end{aligned}$$

Q no 15 Soln:-

$$\text{G.P ratio} = \frac{\text{gross profit}}{\text{Net sales}} \times 100\%$$

$$20\% = \frac{54,000}{\text{Net sales}} \times 100\%$$

$$\Rightarrow \text{Net Sales} = 2,70,000$$

$$\therefore \text{COGS} = \text{Net Sales} - \text{G.P} = 2,70,000 - 54,000 = 2,16,000$$

$$\text{Total Assets Turnover ratio} = \frac{\text{Net Sales}}{\text{Total Assets}}$$

$$0.3 = \frac{2,70,000}{\text{Total Assets}}$$

$$\Rightarrow 9,00,000 = \text{Total Assets}$$

$$\begin{aligned} \text{Credit Sales} &= 80\% \\ \text{Total Sales} &= \end{aligned}$$

$$\text{Credit Sales} = 80\% \text{ of } 2,70,000$$

$$\begin{aligned} \Rightarrow \text{Credit Sales} &= 2,16,000 \\ \text{Avg collection period} &= \frac{\text{Net Credit Sales}}{\text{Avg debtors}} \times 360 \\ \text{Debtors Turnover Ratio} &= \frac{2,16,000}{360} = 18 \end{aligned}$$

$$\therefore \text{Debtor Turnover Ratio} = 18$$

$$\text{Total inventory turnover} = \frac{\text{Net Sales COGS}}{\text{Avg Inventory}}$$

$$4 = \frac{2,70,000 - 2,16,000}{\text{Avg Inventory}}$$

$$\text{Avg inventory} = 54,000$$

$$\begin{aligned} \text{Debt} &= 40\% \\ \text{Equity} &= \end{aligned} \quad \text{Debtor Turnover Ratio} = \frac{\text{Net credit sales}}{\text{Avg debtors}}$$

$$\begin{aligned} \text{Debt} &= 40\% \\ \text{Equity} &= \end{aligned} \quad = \frac{2,16,000}{18}$$

$$\begin{aligned} &= \frac{\text{Debt}}{\text{Equity}} = 40\% \\ \text{Debt} &= 2,40,000 \end{aligned}$$

Creditors	60,000	Cash	42,000
Long term Debts	2,90,000	Debtors	12,000
Shareholder's Fund	6,10,000	Inventory	54,000
		(B.F) Fixed Assets	7,92,000
	<u>9,10,000</u>		<u>9,10,000</u>

$$\begin{aligned} \text{Cash} &= \text{Current Assets} - \text{Debtors} - \text{Inventory} \\ &= 1,08,000 - 12,000 - 54,000 \\ &= 42,000 \end{aligned}$$

Qno. 17 \Rightarrow

Total debt = 0.6	Current debt = 0.4
Owner equity = 0.6	Total debt = 0.4
$\frac{\text{Total debt}}{1,00,000} = 0.6$	$\frac{\text{Current debt}}{60,000} = 0.4$
Total debt = 60,000	Current debt = 24,000

\Rightarrow Fixed assets = 60%

$$\frac{\text{Fixed Assets}}{\text{Owner equity}} = 60\%$$

$$\frac{\text{Fixed assets}}{1,00,000} = 60\%$$

$$\text{Fixed assets} = 60,000$$

$$\text{Total assets turnover} = \frac{\text{Net Sales}}{\text{Total Assets}}$$

$$2 = \frac{\text{Net Sales}}{\text{Total Assets}} = \frac{\text{Net Sales}}{2,52,000} = \frac{\text{Net Sales}}{1,60,000}$$

$$\text{Current liability} = 24,000 \quad \therefore \text{Net Sales} = 3,20,000$$

Liabilities		Assets	
Equity share cap.	1,00,000	Fixed assets	60,000
Current Debt	24,000	Inventory	40,000
Long term debt	360,000	(B.F) Current Assets	80,000
	<u>1,60,000</u>		<u>1,60,000</u>

$$\text{Inventory turnover} = \frac{\text{COGS}}{\text{Avg inventory}}$$

$$8 \text{ times} = \frac{\text{Current Assets}}{\text{Current liability}}$$

$$8 = \frac{\text{Current Assets}}{24,000}$$

$$192,000 = \text{Current Assets}$$

$$\text{Inventory turnover ratio} = \frac{\text{Net Sales}}{\text{Avg Inventory}}$$

$$8 = \frac{3,20,000}{\text{Inventory}}$$

$$\therefore \text{Inventory} = 40,000$$

Qno. 18

$$\text{Stock Velocity} = \frac{\text{Net Sales}}{\text{Avg stock}}$$

$$6 = \frac{\text{Net Sales}}{\text{Avg stock}}$$

$$\text{Net sales} - \text{Avg stock} = 50,000$$

$$\text{Gross profit ratio} = \frac{\text{G.P}}{\text{Net Sales}} \times 100\%$$

$$20\% = \frac{60,000}{\text{Net Sales}}$$

$$\text{Net Sales} = 3,00,000$$

$$\text{Closing stock} - \text{Openin stock} = 5000$$

$$\text{Avg stock} = \frac{\text{Closing} + \text{Openin}}{2}$$

$$50,000 = \frac{5000 + m}{2}$$

$$50,000 = \frac{m + 5000}{2}$$

$$\begin{aligned} \text{Openin stock} &= m = 47500 \\ \text{Closing stock} &= 47500 - 5000 \\ &= 42500 \end{aligned}$$

$$\text{Capital Turnover ratio} = \frac{\text{Net sales}}{\text{Avg cap. employed}}$$

$$2 = \frac{\text{Net Sales}}{\text{Avg capital employed}}$$

$$2 = \frac{3,000,000}{\text{Avg capital employed}}$$

$$\text{Avg capital employed} = 1,500,000$$

$$1,500,000 = \text{Cap employed}$$

$$\text{Fixed Assets Turnover ratio} = \frac{\text{Net Sales}}{\text{Avg fixed assets}}$$

$$4 = \frac{3,000,000}{\text{Avg fixed assets}}$$

$$\text{Avg fixed assets} = 750,000$$

$$\text{Avg fixed assets} = 75,000$$

$$\text{Creditor payment period} = 360$$

$$\text{Creditor turnover ratio} = \frac{360}{75} = 4.8$$

$$5 = \frac{360}{75}$$

$$\text{Creditor turnover ratio} = 5$$

$$5 = \frac{360}{75} = \text{Creditor turnover ratio}$$

$$30 \times \frac{1}{30} = \frac{\text{Avg net credit sales}}{\text{Net credit sales}} \times \frac{360}{\text{Debt collection period}} = \frac{360}{12} = 30$$

$$\text{Debt Turnover Ratio} = 6$$

$$\text{Debt collection period} = 360$$

$$\text{Creditor Turnover Ratio} = \frac{\text{Net Credit Purchase}}{\text{Creditors}}$$

$$5 = \frac{\text{Net Credit Purchase}}{245,000 \text{ Creditors}}$$

$$4 = \frac{\text{Net Credit Purchase}}{2,45,000 \text{ Creditors}}$$

$$\therefore \text{Creditor} = 49,000$$

Balance Sheet

Capital	150,000	Fixed Assets	75,000
---------	---------	--------------	--------

Creditors	49,000		
-----------	--------	--	--

Current assets

- Stock	42,500
---------	--------

- Debtors	50,000
-----------	--------

(BF) - Cash	3,1500
-------------	--------

<u>1,99,000</u>

<u>1,99,000</u>

$$\text{Debt Turnover Ratio} = \frac{\text{Net credit sales}}{\text{Avg debtors}}$$

$$6 = \frac{3,000,000}{\text{Avg debtors}}$$

$$\text{Avg debtors} = 500,000$$

$$\text{Avg debtors} = 50,000$$

$$50,000 = \text{Avg debtors}$$

$$\text{COGS} = \text{Op stock} + \text{Purchase} - \text{Closing stock}$$

$$2,40,000 = 42,500 + \text{Purchase} - 47,500$$

$$\text{Inventory ratio} = \frac{\text{COGS}}{\text{Avg stock}} = \frac{2,40,000}{3,00,000} = 0.8$$

$$8 = \frac{\text{COGS}}{\text{Purchase}} = \frac{2,40,000}{245,000} = 0.98$$

Q19 (1) Fixed assets to sales = $\frac{1}{3}$

$$\frac{26 \text{ lakhs}}{\text{Sales}} = \frac{1}{3}$$

\Rightarrow sales = 78 lakhs.

Fixed assets to current assets = $\frac{13}{11}$

(2) $\frac{26 \text{ lakhs}}{\text{Current assets}} = \frac{13}{11}$

\Rightarrow 22 lakhs = Current assets

(3) Current ratio = $\frac{\text{Current assets}}{\text{Current liabilities}}$

$\frac{2}{1} = \frac{22 \text{ lakhs}}{\text{Current liab.}}$

\Rightarrow 11 lakh = Current liability

(4) $\frac{\text{Long term loan}}{\text{Current liability}} = \frac{2}{2}$

Long term loan = 11 lakh

\Rightarrow long term loan = 11 lakh

(5) Gross profit = 15% of sales
= 15% of 78 lakhs
 \Rightarrow = 11.7 lakhs

Net profit = 8% of sales
= 8% of 78 lakh
= 6.24 lakhs.

(6) COGS = Sales - GP
= 78 lakhs - 11.7 lakhs
= 66.3 lakhs

WIP cost = Cost of goods sold (COGS)

Raw material consumed = 20% of 66.3 lakhs = 13.26 lakhs

Finished goods Direct wages = 10% of 66.3 lakhs = 6.63 lakhs

Finished goods stock = 6% of work cost = 3.978 lakhs

(7) Stock velocity = $\frac{\text{RM}}{\text{L}} = \frac{13.26 \times 3}{12} = 3.315 \text{ lakhs}$

(8) Debt collection period = $\frac{360}{\text{Debtor Turnover ratio}}$
 $60 = \frac{360}{\text{Debtor Turnover ratio}}$

G = Debtor Turnover ratio

(7) Debt Turnover ratio = $\frac{\text{Net Sales}}{\text{Avg debtors}}$

G = $\frac{78 \text{ lakhs}}{\text{Avg debtors}}$

\therefore Avg debtors = 13 lakhs

(8) Total Assets Turnover ratio = $\frac{\text{Net Sales}}{\text{Total Assets}} = \frac{78}{22 + 26} = 1.625$

Current assets = 22 lakhs

3.978 + 13 + 3.315 = 22 lakhs

Current assets (cash) = 1.707 CR-F

(9) $\frac{\text{Capital}}{\text{Reserve}} = \frac{1}{4}$ Capital + Reserve = 15

4 Capital = Reserve

4 Cap + Cap = 15

5 Cap = 15

Cap = 3 lakhs.

(In lakhs)

Balance Sheet as on 31st Dec 2006

Particulars	Amt	Particulars	Amt
Share hold fund	3	Fixed assets	26
Reser	22 ¹ / ₂		
Long term loan	10 lakh		
Current liabilities	11	Closing stock (RM)	3,078.315
		Debtors	13 lakhs
		Closing stock (F.W)	3,978
		Cash	1,707
	<u>1,625.48</u>		<u>1,625.48</u>

Profit and loss A/c (In lakhs)

Raw material	13.26	By sales	78
Direct wages	6.63		
(B.F) Direct overhead	46.41		
G.P	<u>11.7</u>		
(B.F) To operat expen	5.46	By G.P	<u>11.7</u>
Net profit	<u>6.24</u>		
	<u>11.7</u>		<u>11.7</u>

(20)

$$\begin{aligned} \text{Total Debt} &= 1 \\ \text{Net worth} &= 2 \\ \text{Total Debt} &= 4,00,000 + 6,00,000 \\ \text{Total Debt} &= 5,00,000 \end{aligned}$$

Q.27 (b) Revised days sales outstanding = $\frac{\text{Revised Amount Receivable} \times 365 \text{ days}}{\text{Net credit sales}}$

Gr) $30.40 = \frac{\text{Revised AIR} \times 365}{100}$

Rs 8.33 cr = Revised AIR

Now,

Additional cash generated = Existing AIR - Revised AIR
 $= 11.10 - 8.33 \text{ cr}$
 $= 2.77 \text{ crore}$

(i) Soln:-

Revised ROE = $\frac{\text{EAE}}{\text{Equity shareholder's fund}} \times 100\%$
 $= \frac{5}{41.67 - 2.77} \times 100\%$
 $= 12.85\%$

ROA = $\frac{\text{Net profit}}{\text{Total assets}} \times 100\%$
 $= \frac{5}{60 - 2.77} \times 100\%$
 $= 8.74\%$

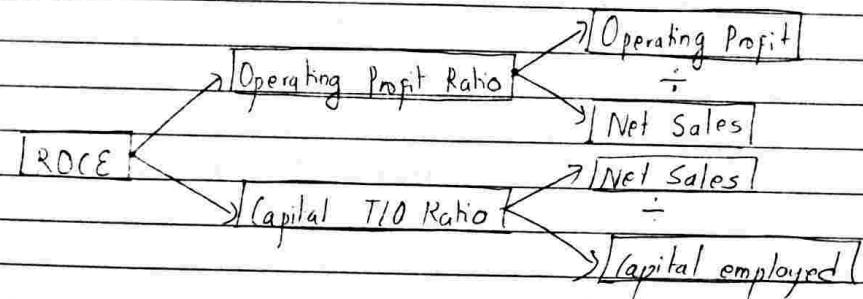
Total Debt / Total Assets Ratio = $\frac{\text{Total Debt}}{\text{Total Assets}}$
 $= \frac{7.78}{57.23}$
 $= 0.136$

Du-Point Analysis Chart for ROCE

ROCE = $\frac{\text{Operating Profit}}{\text{Capital employed}}$

ROCE = $\frac{\text{Operating Profit}}{\text{Net sales}} \times \frac{\text{Net Sales}}{\text{Capital employed}}$

ROCE = Operating Profit Ratio \times Capital Turnover ratio



Du-Point Analysis for ROE

ROE = $\frac{\text{EAE}}{\text{Equity shareholder's fund}}$

$= \frac{\text{Net profit}}{\text{Net sales}} \times \frac{\text{Net Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Equity}}$
 $= \text{Net profit margin} \times \text{Total assets turnover ratio} \times \text{Equity multiplier}$

ROE depends upon three different component as per du-point analysis, namely

- (i) Net profit margin
- (ii) Total assets turnover ratio
- (iii) Equity multiplier

① Net profit margin

It is the ratio of net profit to net sale.

Normally higher profit margin is considered good/better. However management can increase overall profit by reducing the profit margin.

$$\text{Net profit margin} = \frac{\text{Net profit}}{\text{Net sales}}$$

② Total assets turnover ratio

It indicates the efficiency and effectiveness with which the firm utilizes its total assets in generating sales revenue.

$$\text{Total assets turnover ratio} = \frac{\text{Net Sales}}{\text{Total Assets}}$$

③ Equity Multiplier

The equity multiplier is a financial leverage ratio that measures the amount of firm's total assets that were financed by its shareholders by comparing total assets with equity. In another word the equity multiplier shows the percentage of assets that are financed or owned by the shareholders.

$$\text{Equity Multiplier} = \frac{\text{Total Assets}}{\text{Equity}}$$

Hence as per Du-pont

$$\text{ROE} = \text{Net profit margin} \times \text{Total assets turnover ratio} \times \text{Equity multiplier}$$

Note: Assumptions in relation to capital WIP

→ Always assume paid portion of capital WIP is non-trade.

* Assumptions in relation to investments

If investment is non-current and nothing is prefixed with the word investment, always assume non-trade.

Qno 29

Furnish A/c Dr 1,20,000
 To Revaluation reserve 1,20,000
 Depn A/c Dr 1,00,000
 To Furnish 1,00,000

Revenue A/c Dr 20,000
 To Depn 20,000

$$EBIT \left(\frac{100 - \text{tax}}{100} \right) \frac{1}{2} \left(\frac{1}{2} - \text{tax} \right)$$

Capital T/O Ratio

$$= \frac{\text{Net Sales \& Services}}{\text{Capital Employed}} = \frac{23436}{7958} = 2.94 \text{ times}$$

$$\frac{17849}{7342} = 2.43 \text{ times}$$

Q no 9 Working Note:-

(1) Calculation of operating profit ratio:-

Rs in crore

2001 2000

Calculation of operating profit:-

	2001	2000
Sales and services	23436	17,849
(-) Cost of Material	15,179	10,996
(-) Personnel Expenses	2,543	2,292
(-) Depn Other expenses.	3,546	2,815
(-) Depn	422	377
Operating profit	1756	1368
Sales and services	23436	17849
Operating Profit Ratio	7.49%	7.66%

(2) Calculation of capital employed

	2001	2000
Share Capital	1121	931
Reserve and Surplus	8950	7909
Secured loans	74	259
Finance lease obligation	74	
Unsecured loan	171	115
(-) Capital WIP	27	28
(-) Investments	288	222
(-) Loans and advances	2043	1712
Capital employed	7958	7083
		7342

ROE (Return on capital)

$$= \frac{\text{Operating Profit Ratio} \times \text{Capital T/O Ratio}}{\text{Capital T/O Ratio}}$$

$$= \frac{7.49 \times 2.94}{2.94} = 22.62\%$$

$$= \frac{7.66 \times 2.43}{2.43} = 18.61\%$$

(b) Soln. - 2001

$$\text{Raw Material holding period} = \frac{\text{Inventory of Raw Material}}{\text{Raw Material consumption}} \times 360$$

$$= \frac{2709}{15,179} \times 360$$

$$= 64.25 \text{ days}$$

$$\frac{2000}{10996} = \frac{2540}{10996} \times 360$$

$$= 83.16 \text{ days}$$

(c) ROE = $\frac{\text{Net Income}}{\text{Equity shareholders fund}}$

	2001	2000
EBIT	1756	1368
(+) Operating profit	1756	1368
(+) Other income	320	306
(-) Interest	164	88
(-) Tax	444	371
Net Income	1468	1215

Share capital	1121	931
+ Reserve and Surplus	8950	7999
Net Shareholder's fund	10071	8930

Q no 32 Soln:-

Two ratios particularly significant to creditors

	Year 2	Year 1
(i) Current ratio - $\frac{\text{Current Assets}}{\text{Current liabilities}}$	$\frac{50199}{21404}$	$\frac{46589}{18578}$
	= 2.35 : 1	= 2.51 : 1

(ii) Quick ratio - / Liquidity ratio

$\frac{\text{Current Assets} - \text{Inventory} - \text{Prepaid expenses}}{\text{Current liabilities}}$

$\frac{50199 - 25426}{21404}$	= 1.16 : 1	$\frac{46589 - 20231}{18578}$	= 1.42 : 1
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Two ratios particularly significant to management

(i) Fixed assets turnover ratio

$\frac{\text{Net Sales}}{\text{Fixed assets}}$	$\frac{264,626}{6401}$	$\frac{2,20393}{2519}$
	= 41.34 times	= 87.49 times

(ii) Capital turnover ratio

$\frac{\text{Net sales}}{\text{Capital employed}}$	$\frac{264626}{29763}$	$\frac{2,20393}{27263}$
	= 8.89 times	= 8.08 times

Two ratios particularly significant to share holders (Rs in 0)

(i) E.P.S. - $\frac{\text{EAE}}{\text{No of Equity shareholder's fund}}$	$\frac{9380 - 1000 - 4380}{50}$	$\frac{8362 - 1000 - 3642}{50}$
	= 80 per share	= 74.4 per share

$$\text{ROE} = \frac{\text{EAE}}{\text{Equity shareholder's fund}} = \frac{4000}{19763} \times 100\% = \frac{4000}{17,263} = 20.23\% = 21.55\%$$

All ratios are favourable from year 1 to year 2 except current ratio, quick ratio and fixed assets turnover ratio and ROE.

(b) soln:-

$$\text{Gearing for Year 2} = \frac{\text{Fixed Claim bearing fund}}{\text{Equity shareholder's fund}} = \frac{10,000}{19763} = 0.506 : 1$$

Case I

Issue of 10% 16th debenture of Rs 16 million

$$\text{Capital gearing ratio} = \frac{10,000 + 16,000}{19763} = 1.32 : 1$$

Case II:- Right issue at par = 10,000

$$\text{Capital gearing ratio} = \frac{10,000}{19763 + 16,000} = 0.28 : 1$$

When additional fund of Rs 16 million is raised through debenture, the fixed claim bearing fund will increase and hence the gearing ratio will also increase.

EBIT \Rightarrow 16000
 (-) Interest \Rightarrow 10000
 EBT 19000
 Tax @ 15% \Rightarrow 2850
 (9380 - 10000 = -4380)

(c) Soln:-

Case I = Issue of 10% Debenture of Rs. 16 million

EAE = 4000

$$EAE = (9380 + 3500) - (1000 + 16000) - (4380 + (3500 - 16000) \times 25\%)$$

$$= 12880 - 26000 - 5655 - 475 = -4855$$

$$= 5425$$

EPS = $\frac{5425}{50}$

= Rs 108.50 per share.

Case II: Issue of right share at par

$$EAE = (9380 + 3500) - (1000 + 0) - (4380 + (3500 - 0) \times 25\%)$$

$$= 12880 - 1000 - 5255 = 6625$$

EPS = $\frac{6625}{50 + 160}$

$$= 31.55$$

Qno 303 Fixed Assets Ratio = $\frac{\text{Fixed Assets}}{\text{Net Sales}}$

T	Fixed Assets	Net Sales
3900	4000	5000
2000	2500	3000
1.95	1.6	1.67 times

Stock turnover ratio = 500

Qno 22 Notes

While computing current assets,
 \Rightarrow Debtors who agree to settle their dues by transfer of fixed assets or issue of their debenture/long term should be excluded.

\Rightarrow Inventories should be shown at their cost or NRV whichever is lower, hence absolute stock should be valued at their NRV.

While computing current ratio, current liabilities should include
 \Rightarrow Purposed dividends, even though no provision is given in this regard but the amount of purposed dividend is disclosed in notes to accounts.

\Rightarrow The installment of debt shown under the head secured loans and unsecured loans should be included in current liabilities when they are payable within 12 months.

Note:- keep into mind the window dressing done by the management at the end of financial year and adjust the same before computing liquidity ratios.

(a) Sundry creditors paid at the year end by sale of fixed assets or long term investments.

(b) Sale proceeds of fixed assets or investments shown as cash under current assets and repurchase in the beginning of the next year.

(c) Advances for capital equipment should be included from current assets while computing current ratios.

Q no 22 Soln:-

	A Ltd	B Ltd
(I) Current assets		
Inventory	23,00,000	45,00,000
Debtors	-	17,00,000
Bank	5,70,000	5,50,000
	28,70,000	67,50,000
less:- 50% Debtors of B Ltd	-	8,50,000
will be discharged by acceptance of 15% debtors of C Ltd		
	28,70,000	59,00,000
Current liabilities		
Creditors	15,00,000	14,00,000
OS expenses	2,00,000	3,00,000
Provision for tax	3,00,000	3,00,000
Proposed dividend	6,00,000	-
Unclaimed dividend	15,000	-
(+) Creditors settled at the end of the year by sale of investment	-	5,00,000
(+) Proposed dividend of B		10,00,000
	26,15,000	35,00,000

Current Ratio = $\frac{\text{Current assets}}{\text{Current liability}}$

A $\rightarrow \frac{28,70,000}{26,15,000} = 1.10 : 1$

B $\rightarrow \frac{59,00,000}{35,00,000} = 1.686 : 1$

Quick ratio = $\frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities} - \text{Bank od}}$

= $\frac{28,70,000 - 23,00,000}{26,15,000} = 0.217 : 1$

= $\frac{35,00,000 - 59,00,000 - 45,00,000}{35,00,000} = 0.4 : 1$

(1) Bridge Finance

- For the short term existence.
 - Because long term loan will take time to be taken or provide by bank.
 - When bank gives long term loan the it is going to be settled.
 Short term loan is given by the bank until it receives the long term loan.

(2) Seed Capital Assistance

Subsidy, given to the initial startup, not only share capital but also loan, first ma company interest pay garna, so low interest rate ma bank le company (startup) wala lai loan farsa 1

(3)

690,000
573,000
137,000

17

in lakh

Sales :-	150
(-) V.C	90
Contb ⁿ	60
(-) F.C	30
EBIT	30
(-) Int	13
EBT	17
(-) Tax @ 40%	6.8
EAT	10.2
(-) P.D	3
EAE	7.2 lakh.

$$\text{Financial leverage} = \frac{\text{EBIT}}{\text{EBIT} - \text{Pref div} \downarrow - \text{tax rate}} = \frac{\text{EBIT}}{\text{EBIT}}$$

$$2.5 = \frac{\text{EBIT}}{(\text{EBIT} - \text{Interest}) - \text{Pref div} \downarrow - \text{tax rate}}$$

$$2.5 = \frac{\text{EBIT}}{(\text{EBIT} - 13) - 3 \downarrow - 40\%}$$

$$2.5 = \frac{\text{EBIT}}{(\text{EBIT} - 13) - 5}$$

$$2.5 = \frac{\text{EBIT}}{\text{EBIT} - 18}$$

$$2.5 \text{EBIT} - 45 = \text{EBIT}$$

$$30 = \text{EBIT}$$

$$\text{O.C} = \frac{\text{Contribution}}{\text{EBIT}}$$

$$\frac{2}{1} = \frac{\text{Contb}^n}{30}$$

$$60 = \text{Contb}^n$$

VC = 60% of sales.
 Contbⁿ = 40% of sales
 60 = 40% of sales
 150 = sales

$$\text{ROI} = \frac{\text{EBIT}}{\text{Capital Employed}}$$

$$= \frac{30}{240}$$

$$= 12.5\%$$

where Capital employed
 Equity share holder's fund = 36 + 55 - 1
 = 90.
 10% Debt = 130
 15% Pref div = 20
 Total 240 lakh

$$\text{ROE} = \frac{\text{EAE}}{\text{Equity shareholder fund}} = \frac{7.2}{90}$$

$$= 8\%$$

$$\text{P.E ratio} = \frac{\text{M.P.S}}{\text{E.P.S}} = \frac{20}{2} = 10.$$

where EPS = $\frac{\text{Earning available}}{\text{No of eq's shrs}} = \frac{7.2}{360,000} = 2$

Insured → PHT → ~~Income~~
 Insurer → Taxing ~~Income~~

Segments of ROE

Due to Debt

$$\left[ROCE + \left[(ROCE - k_d) \frac{D}{E} \right] (1 - tax) \right] \times 100\%$$

$$= 12.5 + \left(12.5 - 10\% \right) \times \frac{130}{90} \times (1 - 40\%)$$

$$= 12.5\% + 0.02166$$

$$ROCE + \left(ROCE - k_p \right) \frac{PSC}{E} (1 - tax)$$

$$ROCE + (7.5\% - 15\%) \times \frac{20}{90}$$

12.5% - 0.0167

= 12.5% + 0.02166 - 0.0167

= 12.5049% #

18

Sales	10,00,000
(-) VC	6,00,000
Contb ⁿ	4,00,000
(-) FC	2,00,000
EBIT	2,00,000
(-) Int	80,000
	1,20,000
	48,000
	72,000
	12,000
	60,000
	10,000
	50,000

$$\frac{EBIT}{EBT - Pref} = \frac{2}{1}$$

$$\frac{EBIT}{(1 - tax)}$$

$$\frac{EBIT}{120,000 - 12,000} = \frac{2}{1}$$

$$EBIT = 2,00,000$$

Committee → Section 3.

Sec 10:- Registration shall be done ⇒ to commence the business
 Sec 11:- Renewal of the registration shall be done ⇒ last day of Chaitra of each year for the renewal of COR.

Sec 11A:- Circumstance when COR cannot be renewed:-

- Balance sheet not submitted
 - Statement of income has not been submitted
 - Audit report not submitted.
 - Actuary has not been submitted.
 - Service charge not paid
 - Prohibited to operate the insurance business
- ↳ Board will notify all these circumstances

Sec 12:- Not to be registered in the following case:-

- Name of the insurer is identical to another
- cannot operate both life and non-life insurance. if commenced before this act (the business) then it should be opened as separate organization.
- Paid up does not meet $\left\{ \begin{array}{l} 200 \rightarrow \text{non life insurance.} \\ 250 \text{ For } \rightarrow \text{life insurance.} \end{array} \right.$
- In case the board has banned to register.

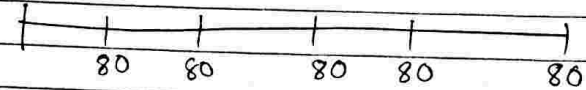
12A. A ban may be imposed on insurance business:-

- If directives not followed
- If insurer provides loan to any corporate body in which any of his director or family
- Does not provide information to be provided
- Does not maintain AIC
- Does not maintain separate A/C

Bond Valuation

Qno 2

Current selling price = 925.



$$\begin{aligned} \text{Approx YTM} &= \frac{I + \frac{RV - NP}{N}}{\frac{RV + NP}{2}} \\ &= \frac{80 + \frac{1000 - 925}{5}}{\frac{1000 + 925}{2}} \\ &= \frac{80 + 15}{962.5} \\ &= \frac{95}{962.5} = 9.87\% \end{aligned}$$

Try at 8%.

$$\begin{aligned} \text{Price} &= 80 \times \text{PVIFA}_{8\%, 5 \text{ years}} + 1000 \times \text{PVIF}_{8\%, 5 \text{ year}} \\ &= 80 \times 3.9927 + 1000 \times 0.6806 = 687.27 \\ &= 999.096 \end{aligned}$$

Try at 10%.

$$\begin{aligned} \text{Price} &= 80 \times \text{PVIFA}_{10\%, 5 \text{ years}} + 1000 \times \text{PVIF}_{10\%, 5 \text{ year}} \\ &= 80 \times 3.69589 + 1000 \times 0.59345 \\ &= 889.12 + 593.45 = 1482.57 \end{aligned}$$

Try at 9%.

$$\begin{aligned} \text{Price YTM} &= 80 \times \text{PVIFA}_{9\%, 5 \text{ year}} + 1000 \times \text{PVIF}_{9\%, 5 \text{ year}} \\ &= 80 \times 3.8896 + 1000 \times 0.6499 \\ &= 961.072 \end{aligned}$$

$$\begin{aligned} \text{YTM} &= 9 + \frac{961.072 - 925}{961.072 - 924.183} \end{aligned}$$

$$= 9 + \frac{36.072}{36.869}$$

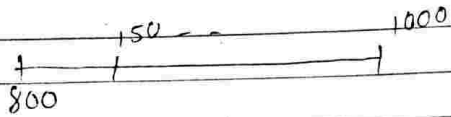
$$= 9.98\%$$

Qno 13

$$\begin{aligned} \text{Perpety} &= \frac{\text{Interest}}{\text{Rate of return}} \\ &= \frac{90}{0.1} \\ &= 900 \end{aligned}$$

$$\begin{aligned} &= \frac{90}{0.08} = 1125 \\ &= \frac{90}{0.12} = 750 \# \end{aligned}$$

Qno 14



$$\begin{aligned} \text{Holding period return} &= \frac{\text{Bond value at the end of holding period} - \text{Bond value at beginning} + \text{Intst}}{\text{Bond value at beginning}} \\ &= \frac{(1000 - 800) + 150}{800} \\ &= \frac{200 + 150}{800} = \frac{350}{800} = 0.4375 \\ &= 43.75 \end{aligned}$$

(b) Same Bond value at end 750.

$$\begin{aligned} \text{HPR} &= \frac{(750 - 800) + 150}{800} \\ &= \frac{-200}{800} \\ &= -25\% \# \end{aligned}$$

Application supported by Blocked Amt.
ASBA

Qno 15

Investment opportunities in Nepalese capital Market

Qno 1 Solution

(1) Cash balance of the fund at the end of 2008

$$\begin{aligned} \text{(a) Opening balance (LCR - 98L)} &= 2,00,000 \\ \text{(b) Dividend received} &= 12,00,000 \end{aligned}$$

$$\begin{aligned} \text{(c) Int Received (50000 + 45000 + 50000)} &= 1,51,000 \\ \text{less - Operating expenses} &= (500,000) \\ \hline &= 19,51,000 \end{aligned}$$

(2) Net Assets [At the end of 2008]

$$\begin{aligned} \text{Net Assets} &= \text{Value of Inv + Cash + Rec. + Other Assets} \\ &\quad - \text{Liabilities} \\ &= 10,500,000 + 10,51,000 + 0 - 0 \\ &= 11,51,000 \end{aligned}$$

Wb (1) Value of investment

$$\begin{aligned} 50,000 \times 175 &= 8,750,000 \\ 7\% \text{ Govt. Sec} &= 8,100,000 \\ 9\% \text{ debt} &= 5,000,000 \\ 10\% \text{ deb.} &= 4,500,000 \\ \hline &= 10,500,000 \end{aligned}$$

1st case

$$\begin{aligned} \text{NAV} &= \frac{\text{NA}}{\text{No of units}} \\ &= \frac{11,51,000}{1,00,000} = 11.51 \end{aligned}$$

If 0.8 dividend distributed then cash balance =

1051000 + 105000000

Date: / /

2nd case

NAV if MF discounts 0.8 per unit

$$1051000 - 100,000 \times 8$$

$$= 251000$$

$$\therefore \text{NAV} = \frac{10500000 + 251000}{10,00,000}$$

$$= 10.751$$

Value investment +

(Q no 2) Computation of net assets.

Value of invest + cash and bank balance + receivable + other assets - liabilities

$$= 420,00,000 + 48,00,000 + 2,00,000$$

$$0 - 10,00,000$$

0,000 x 350 + 30,000 x 200

$$= 4,60,00,000$$

(ii) NAV/unit = Net assets

$$\frac{\text{No of d/s unit}}{4,60,00,000}$$

$$= \frac{40,00,000}{4,60,00,000}$$

$$= 11.50$$

asset ↑
liability ↓
Bond men

The NAV is Rs 11.50 and market value is 12.85.

Hence it is overpriced unit. Therefore overpriced unit must be sold.

Thanks off
reuben

Q no 3

(i) NAV (1st Baisakh 2073) = Net Assets = (20,000 x 435) + (30,000 x 322) +

$$\frac{\text{No of units}}{59080000}$$

$$= \frac{600,000}{59080000}$$

$$= 98.47$$

(b) Position after 30 lakhs received

No of new units issued to M.F.A. = $\frac{30,00,000}{98.45}$

$$= 30466 \text{ units}$$

(ii) ~~from~~ New No of unit = 6,00,000 + 30466

$$= 630466 \text{ units}$$

New value of invest

(As on 1st Baisakh 2073) = (20,000 x 435) + (38,000 x 322)

$$+ (20,000 x 461) + (60,000 x 525)$$

+ Cash balance [3,00,00,000 - 8000 x 350]

$$= 424,000$$

$$= 6,20,80,000$$

$$\text{NAV} = \frac{6,20,80,000}{630466}$$

$$= 98.47$$

$$= 98.47$$

(1) NAV (2-1-2072)

$$= 20,000 \times 445$$

$$+ 38000 \times 360 + 20,000 \times 483 + 60,000 \times 515$$

$$= 6,31,40,000 + \text{Cash Balance}$$

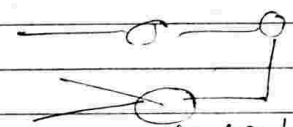
$$= 6,31,40,000 + 424000$$

(2) NAV per unit = $\frac{6,31,40,000 + 424000}{630466}$

5 Expense Ratio = $\frac{\text{Related expense}}{\text{Avg NAV}} \times 100\%$
 $= \frac{0.5}{20+24} \times 100\%$
 $= 2.27\%$

6 Return (%) = $\frac{1.5 + 1 + (0.5) + (13 - 12.5)}{12.5} \times 100$
 $= 24\%$

Same $\left\{ \frac{4000 \times (1.5 + 1 + 0.5)}{4000 \times 12.5} \right\}$



Mutual fund ke badke dividend ho.

Now, the amt of dividend and capital gained received is.

$4000 \times [1 + 1.5]$
 $= 10,000$

In between dividend badke huncha
 bich ma 12.6 ke chahina.

Now, $\frac{10,000}{12.6} = 794$

So at the end ma sngi ~~40,70~~ 4794 unit hucha.

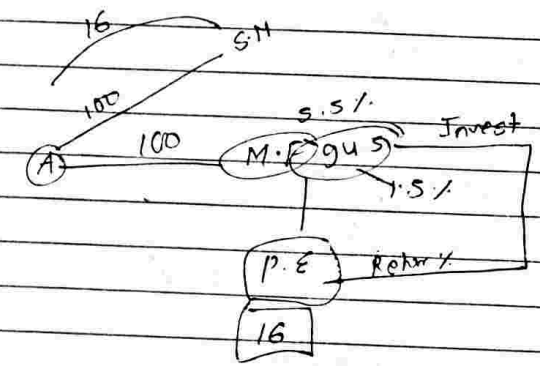
If all the dividend and capital gain are ^{reinvested} distributed then

Total amt reinvested = $4000 \times [1 + 1.5] = 10000$ units
 Additional unit = $\frac{10,000}{12.6} = 794$ units

Value of investmet = $(4000 + 794) \times 13 = 62322$
 Value of investmet at the beginnij = $4000 \times 12.5 = \text{Rs } 50,000$

% Return = $\frac{(62322 - 50,000)}{50,000} \times 100\%$
 $= 24.64\%$

Q.108



Suppose Mr. A has Rs 100.

- The return desire from mutual fund = $100 \times 16\% = \text{Rs } 16$.
- If Mr. A invest in mutual fund the initial expense is $5.5\% = \text{Rs } 5.5$
 \therefore Investible fund available with mutual fund = $100 - 5.5 = 94.5$.

However mutual fund should incur 1.5% as recurring expenses on invested amt.

\therefore Amt of recurring expenses = $0.015 \times 94.5 = \text{Rs } 1.4175$

Now,

Return to Mr A = Invested amt X % return - Reinv. expenses

Rs 16 = 94.5 X % return - 1.4175

∴ % return = 18.73 %

① Net Income Approach (NI)

Major - Cost of debt won't be changed.
Interest remains same no matter how much loan we take.

Qno 13 Computation of net income-

EBIT :- 1 lakh
(-) Interest :- 40,000
EBT 60,000 (NI)

② Value of Equity (E) = $\frac{\text{Net Income}}{k_e}$
= $\frac{60,000}{12.5\%} = 4,80,000$

③ Value of Debt (D) = $\frac{\text{Interest}}{k_d} = \frac{40,000}{10\%} = 4,00,000$

④ Value of firm (V) = E + D = 4,80,000 + 4,00,000 = 8,80,000

⑤ Overall cost of capital (WACC) = $\frac{\text{EBIT}}{V}$
= $\frac{1,00,000}{8,80,000} = 11.36\%$

OR WACC = $w_d \times k_d + w_e \times k_e$
= $\frac{4,00,000}{8,80,000} \times 0.1 + \frac{4,80,000}{8,80,000} \times 0.125$
= 11.36 %

Qno 14

Net income :- EBIT :- 1 lakh

Interest :- 50,000
NI :- 50,000

Value of equity (E) = $\frac{\text{Net Income}}{\text{Cost of equity}}$
= $\frac{50,000}{0.125} = 4,00,000$

Value of firm (V) = 5,00,000 + 4,00,000 = 9,00,000

Since value of debt is 5,00,000

Ans

Overall cost of capital = $\frac{\text{Overall EBIT value}}{\text{value}}$
= $\frac{50,000}{9,00,000}$

∴ WACC = 11.11%

Qno 15

Net income :- EBIT 1,00,000
less Interest :- 30,000
NI 70,000

Value of equity (E) = $\frac{70,000}{0.125} = 5,60,000$

Value of debt (D) = 3,00,000

WACC = $\frac{E \cdot r_E + D \cdot r_D}{V}$ Value of firm's not tax

Date: / /

Value of firm = $5,60,000 + 3,00,000$
 $= 8,60,000$

WACC = $\frac{1,00,000}{8,60,000} \times 100\%$
 $= 11.63\%$

Qno 16

Here,

① Net income

EBIT = 1,00,000
 (-) Interest 40,000
 Net income 60,000

② Value of firm (V) = $\frac{EBIT}{k_0}$

$V = \frac{1,00,000}{0.125}$

Total value = 8,00,000

③ Value of debt = 4,00,000

④ Value of equity (E) = $8,00,000 - 4,00,000$
 $= 4,00,000$

⑤ $k_E = \frac{NI}{E}$ or, $k_E = \frac{NI}{E}$

$= \frac{60,000}{4,00,000}$
 $= 15\%$

Qno 17

EBIT = 1 lakh
 (-) Interest 50,000
 NI = 50,000

Value of firm = $\frac{EBIT}{k_0}$

Net operating income approach } Dherai debt leko karan lo jun kami
 aautyo hjo exactly set off huncha
 kinaka equity share holder E n Daravchan
 ani hjo mathi utdai jancho ani ke
 bad dai jancho.

$= \frac{50,000}{0.125}$
 $= 4,00,000$

Total value 8,00,000

Value of D = 5,00,000

E = $8,00,000 - 5,00,000$
 $= 3,00,000$

$E = NI$
 k_E

$3,00,000 (E) = \frac{50,000}{k_E}$

$k_E = 16.67\%$ $k_E = 6\%$

Qno 18

EBIT = 1 lakh.

(-) Interest = 30,000
 70,000.

(V) = $\frac{1,00,000}{k_0}$

$= 8,00,000$

D = 3,00,000

E = $8,00,000 - 3,00,000$
 $= 5,00,000$

$k_E = \frac{70,000}{5,00,000}$

$= 14\%$

Date: / /

Q no 19	X Ltd	Y Ltd	Z Ltd
NI			
D =	3,00,000	2,00,000	1,00,000
Net Income	5,00,000	30,000	40,000
Interest	-30,000		
	2,00,000 = 20,000		
E = NI	20,000	30,000	40,000
Ke =	0.25	0.125	0.125
V =	4,00,000	2,40,000	3,20,000
Ko =	50,000	50,000	50,000
	4,60,000	4,40,000	4,20,000
	= 10.87%	= 11.36%	= 11.90%

When the amount of debt increases the WACC decreases so it is beneficial for the company to take more loan because in NI approach there's no risk no much how much debt we take.

NOI	X Ltd	Y Ltd	Z Ltd
Debt	3,00,000	2,00,000	1,00,000
EBIT	50,000	50,000	50,000
NI	20,000	30,000	40,000
Ko =	0.125	0.125	0.125
V = EBIT / Ko	50,000 / 0.125 = 4,00,000	50,000 / 0.125 = 4,00,000	50,000 / 0.125 = 4,00,000
E = V - D	4,00,000 - 3,00,000 = 1,00,000	4,00,000 - 2,00,000 = 2,00,000	4,00,000 - 1,00,000 = 3,00,000
Ke = NI / E	20,000 / 1,00,000 = 20%	30,000 / 2,00,000 = 15%	40,000 / 3,00,000 = 13.33%

Date: / /

Income Statement

Q no 20	X Ltd	Y Ltd
EBIT :-	6,00,000	6,00,000
Interest	1,80,000	-
EBT	4,20,000	6,00,000
(-) Tax @ 40%	1,68,000	2,40,000
(Net Income) EAT	2,52,000	3,60,000
Ke =	15%	15%
E = NI / Ke	2,52,000 / 0.15 = 1,68,000	3,60,000 / 0.15 = 2,40,000
D =	1,80,000	-
V =	3,48,000	2,40,000

Q no 20 Investors Position in Company 'X'

EBIT = 18,000

(-) Interest = 3,600

Net income = 14,400

Investors share in net income = 10% of 14,400
(i.e. dividend income) = RS 1,440

Investors Position in Company 'Y' after switching.

(1) Investor will sell the shares of Co. X at market value and realise the sale proceeds.
Sales proceeds = 9,000 x 1.2 = RS. 10,800

(2) Investor will obtain 6% personal loan equal to the share holding in company 'X'.
Loan Amount = 60,000 x 10% = RS 6,000

$$\textcircled{3} \text{ Total available amount} = 10800 + 6000 \\ = 16,800$$

$\textcircled{4}$ Now, the investor has two options

(i) Option 1: Invest all the funds in Company 'Y'

$$\text{No. of shares purchased in Company Y} = \frac{16,800 \times \text{Rs } 1}{1} = 16,800 \text{ shares}$$

Investor's future income in Co 'Y' will be:-

$$\begin{array}{r} \text{EBIT} = 18,000 \\ - \text{Int} = 0 \\ \hline \text{NI} \quad \quad 18,000 \end{array}$$

$$\text{Investor's share in NI (i.e. dividend income)} = \frac{18,000 \times 16,800}{150,000} = \text{Rs. } 2,016$$

However investor shall pay interest on personal loan. Therefore net income = Dividend income - Interest p.a.

$$= 2016 - 50.00 \text{ @ } 6\% \\ = \text{Rs } 1,656$$

$$\text{Arbitrage gain} = \text{Rs } 1,656 - \text{Rs } 1,440 \\ = \text{Rs } 216 \#$$

Conclusion:- It can be concluded that investor's future position will be better if he shifts his investment from company X to company Y.

(ii) Option no. 2:-

Investor will purchase 10% shares of company Y.
 No. of shares purchased = $\frac{150,000 \times 10}{100} = 15,000$ shares
 Investment amount = 15,000 share at Rs 1

$$\therefore \text{Initial cash saving} = 16,800 - 15,000 \\ = \text{Rs } 1,800$$

Investor's future income in company Y will be:-

$$\begin{array}{r} \text{EBIT} \quad \quad 18,000 \\ \text{less Interest} \quad 0 \\ \hline \text{NI} \quad \quad 18,000 \\ \text{Share in dividend} = \frac{18,000}{150,000} \times 15,000 \\ = \text{Rs } 1,800 \end{array}$$

$$\text{Net income} = \text{Dividend Income from Co Y} - \text{Interest on personal income} \\ = 1,800 - 360 \\ = \text{Rs } 1,440$$

Conclusion:- From the above calculation it can be seen that investor's future income will remain same i.e. Rs 1,440 after shifting from company X to company Y and there is initial cash saving of 1,800. Hence there is a gain from shifting.

Q no 21 Assuming:-

Assumption:-

Investor holding in Co. A = 10%

(1) Investor's position in company 'A'
 EBIT = 100 lakh

(-) Interest 0

Net income 100 lakh

Dividend income = 100 lakh \times 10% = 10 lakh.

Investor's position in company B after shifting:-

Step 1 Investor will shift his holding in company A at market value and realise the amount.
 Amount realised = $400 \times 10\%$
 = Rs 40 lakh

(2) Now the investor will invest in both debentures and equity shares of company B. as follows:-

Option 1:- Investment of all funds in company B as per market value proportions:-

$$\text{Investment in debenture} = \frac{200}{320} \times 40$$

$$= 25 \text{ lakh}$$

$$\text{Investment in shares} = \frac{120}{320} \times 40 = 15 \text{ lakh}$$

$$\text{Total investment} = 40 \text{ lakh.}$$

Now, investor's future position in Co. B will be
 EBIT = 100 lakh

$$(-) \text{ Interest} = 30 \text{ lakh}$$

$$\text{Net income} = 70 \text{ lakh.}$$

$$\% \text{ Interest income of investor} = \frac{30}{200} \times 25. [25 \times 15\%]$$

$$= 3.75.$$

$$\text{Dividend income} = \frac{70}{120} \times 15$$

$$= 8.75$$

$$\text{Total income} = 12.50 \text{ lakh.}$$

From the above computation it can be concluded that ^{Divid} Investor's ~~net~~ ^{future} income will be increased from Rs 10,00,000 per annum to Rs 12.5 lakh per annum hence there is a gain from shifting.

Option 2

Investment in 10% of debenture and 10% in shares (Company B).

$$\text{Investment in debenture} = 0.1 \times 200 = 20 \text{ lakh}$$

$$\text{Investment in shares} = 0.1 \times 220 = 12 \text{ L}$$

$$\text{Total investment} = 32 \text{ lakh.}$$

$$\text{Initial cash saving} = 40 \text{ L} - 32 \text{ L} = 8 \text{ L}$$

Investor's future income for 'B' will be

$$\text{EBIT} \quad 100$$

$$(-) \text{ Int} \quad 30$$

$$\text{NI} \quad 70 \text{ lakhs.}$$

$$\text{Int income} = 20 \text{ L} \times 15\% = 3 \text{ L}$$

$$\text{Div. Income} = \frac{70}{120} \times 12 = 7 \text{ L}$$

$$\text{Total income} = 10 \text{ L}$$

Conclusion:- From the above computation it can be concluded that investor's future income will be same in both the companies - as there is an initial cash saving of Rs 8 lakhs if investor shifts his holding from Co. 'A' to Co. 'B'.

Qno 26 Soln:-

Phel typewriter's Ltd

Given

Overall WACC (k_0) = 18%

EBIT = Rs 360,000

Tax = 0%

$$\begin{aligned} \text{(1) Value of the firm (V)} &= \frac{\text{EBIT}}{\text{Overall cost}} \\ &= \frac{360,000}{0.18} \\ &= 20,00,000 \end{aligned}$$

$$\begin{aligned} \text{(2) Value of Equity } E &= 50\% \text{ of Total value} \\ &= 50\% \text{ of } 20,00,000 \\ &= 10,00,000 \end{aligned}$$

$$\text{(3) Value of Debt } D = 10,00,000$$

$$\begin{aligned} \text{(4) Now } k_e &= \frac{\text{Net income}}{\text{Cost of equity}} \\ 10,00,000 &= \frac{\text{Net income } 2,30,000 \text{ (Net income)}}{k_e} \end{aligned}$$

$$\therefore k_e = 23\%$$

$$\begin{aligned} \text{(5) Investor's Rupee return in 2\% share holding} \\ &= 2,30,000 \times 0.02 \\ &= \text{Rs } 4600 \end{aligned}$$

WN-1 Net income

EBIT = 360,000

(-) Intst = 1,30,000

net income 2,30,000

$$= \frac{2,30,000}{k_e}$$

(ii)

Gills typewriter Ltd

Given

WACC (k_0) = 19%

EBIT = Rs 360,000

Tax = 0%

$$\begin{aligned} \text{(1) Value of firm} &= \frac{360,000}{0.19} \\ &= 20,00,000 \end{aligned}$$

$$\begin{aligned} \text{(2) Value of Equity} &= 80\% \text{ of Total value} \\ &= 0.8 \times 20,00,000 \\ &= 16,00,000 \end{aligned}$$

$$\text{(3) Value of Debt } D = 4,00,000$$

$$\begin{aligned} \text{(4) Value of equity} &= \frac{3,08,000}{k_e} \\ 16,00,000 &= \frac{3,08,000}{k_e} \end{aligned}$$

$$\therefore k_e = 19.25\%$$

~~Phel~~ Gills have less debt \therefore Investor's expectation is low as compared to Phel.
 \therefore Equity capite

WN-2 Income Income

EBIT :- 360,000

(-) Intst :- 52,000

NI = 3,08,000

Dheval loan equity share holder dar = expectation of Ke should be more => Date: / /

The equity capitalization rate for Phil typewriters Ltd is 23% whereas it is only 19.25% in case of Gills typewriters Limited. Ke of Phil is higher because it uses more debt in its capital structure as compared to Gills typewriter Ltd. Expectations of equity investor will be more if company uses more debt in capital structure.

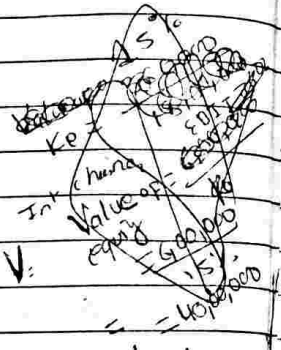
Dar is E so expectation high huncha more risk more return

Qno 23

	X	Y
EBIT	600,000	6,00,000
(-) Interest	1,80,000	-
EBT	420,000	6,00,000
Tax @ 40%	1,58,000	2,40,000
		NI 3,60,000

Just like Qno 22

Tax pay 31% vanda
35% interest
4-21
FAS ka
EAT ka
kam huncha
kam prof
kam tax
kam tax
kam tax
kam tax
value of firm ↑



Note:- Under NOI approach, if there is a corporate taxes then value of levered firm will be more than value of unlevered firm because interest expense is tax deductible. Due to this reason, overall cost of capital will be reduced and value of firm will increase. As per theory, value of levered firm is calculated as follows:-

Step 1:- Compute value of unlevered firm.
Step 2:- Value of levered firm = Value of unlevered firm + Amount of debt X tax rate

$$V_L = V_U + Debt \times tax$$

$$= 40,00,000 + 18,00,000 \times 40\%$$

$$= 47,20,000$$

Date: / /

Qno 23

Value of company Y i.e.

$$EBIT = 6,00,000$$

$$(-) Interest = 0$$

$$EBT = 6,00,000$$

$$(-) Tax @ 40\% = 2,40,000$$

$$NI = 3,60,000$$

$$\text{Value of equity (E)} = \frac{NI}{K_e}$$

$$= \frac{3,60,000}{0.15}$$

$$= 24,00,000$$

Qno 23

Value of 10% (levered firm)

$$= \text{Value of 10 Y (Unlevered firm)} + \text{Amt of debt} \times \text{Tax Rate}$$

$$= 24,00,000 + 1,800,000 \times 0.4$$

$$= 24,00,000 + 7,20,000$$

$$= Rs 31,20,000$$

$$K_e = \frac{D}{V} + (1 - \frac{D}{V}) \times K_u$$

Qno 31

Before Re-structuring
Value of firm (V) =
or

$$\text{Value of equity (E)} = 25,00,000$$

$$\text{Cost of equity or overall cost} = [i.e. k_e \text{ or } k_o] = 21\%$$

After Re-structuring

$V = ?$

$k_e = ?$

WACC = ?

Value of loan (D) = 5,00,000

(Value of debt)

Value of equity (E) = ?

Value of firm (V) =

We have to calculate EBIT first, so EBIT comes from.

$$E = \frac{NI}{k_e}$$

$$25,00,000 = \frac{NI}{0.21}$$

Now, $NI = 5,25,000$

$EAT = 5,25,000$

T.R = 30%

$$EBT = \frac{5,25,000}{1 - 0.3}$$

$$= 7,50,000$$

$$EBIT = EBT + Interest = 7,50,000 + 0 = 7,50,000$$

Income statement

EBIT = 7,50,000

- Int = 75,000

- EBT 6,75,000

(-1 Tax @ 30% 2,02,500

NI 4,72,500

$EBT = n$

- Tax @ 30%

$= 5,25,000$

$n - 0.3n = 5,25,000$

$n = 7,50,000$

- Mr. Ram

Income from employment 10 lakh

" " business 10 lakh

Investment 10 lakh

Windfall gain 0

Contribution to ARF → 5 lakh

Donation to PM Relief → 50,000

Donation to Tax exempt org = 2,00,000

For constitution of kashamandap = 1 lakh.

Find up taxable income.

Income from employment 10 lakh

" " business 10 lakh

" " investment 10 lakh

windfall gain 0

Assessable Income 30 lakh.

less:- Contribution to approved relief fund 3,00,000

Adjustable taxable income 27 lakh.

less:- Donation to PM Relief 50,000

26.5 lakh

less:- Donation to Tax exempt 1 lakh

25.5 lakh

less:- Contribution for Heritage 1 lakh (Available to

24.5 lakh company only)

25.5

242,300

2,97,800

$$\text{Value of equity (E)} = \frac{NI}{k_e}$$

Can't be calculated cause we don't have Value of firm.

Value of levered (Re-structured) firm

= Value of firm before re-structure (i.e. Value of unlevered firm + Amt of debt \times Tax rate).

$$= 25,00,000 + 5,00,000 \times 0.3$$

$$= 26,50,000$$

$$D = 5,00,000$$

$$\text{Value of equity (E)} = 21,50,000 \text{ (B.F.)}$$

$$\text{Value of firm} = 26,50,000$$

$$\text{Value of equity} = \frac{NI}{k_e} @ k_e = \frac{472,500}{21,50,000} \times 100$$

$$= 21.98\%$$

$$\# \text{ WACC} = W_e k_e + W_d k_d$$

$$= \frac{21,50,000}{26,50,000} \times 21.98\% + \frac{5,00,000}{26,50,000} \times 15\% (1-0.3)$$

$$= 19.81\% \#$$

Traditional Approach

As per traditional approach capital structure is relevant. Therefore company should minimize the overall cost of capital and maximize the value of firm. The capital structure will be the one where overall cost of capital will be minimum.
(WACC)

Statement showing computation of WACC

Situation	Debt	Eqly	k_d	k_e	WACC
1	0	1,00,000	0	10.00	10%
2	1,00,000	9,00,000	4	10.50	9.85
3	2,00,000	8,00,000	4	11.00	9.6
4	3,00,000	7,00,000	4.50	11.60	9.47
5	4,00,000	6,00,000	5.0	12.40	9.44
6	5,00,000	5,00,000	5.5	13.50	9.50
7	6,00,000	4,00,000	6.0	16.00	10
8	7,00,000	3,00,000	8.0	20.00	11.6

Conclusion:-

The WACC is lowest if the firm employs 4,00,000 debt and 6,00,000 equity in its capital structure. ∴ The company should maintain 4,00,000 debt and 6,00,000 equity to maximize value of firm.

As per MM approach capital structure is irrelevant. Overall cost of capital will remain same in all levels of debt equity mix. Therefore value of levered firm is equal to value of unlevered firm. Thus overall cost of capital will be 10% in all debt equity mix.

Statement showing computation of k_e :-

Situation	k_a Debt	weight of debt (w_d)	wt of equity (w_e)	k_d	k_e
1	10%	0	1	0	10%
2	10%	0.1	0.9	4	10.67
3	10%	0.2	0.8	4	10.50
4	10%	0.3	0.7	4.5	10.36%
5	10%	0.4	0.6	5.0	10.33%
6	10%	0.5	0.5	5.5	10.50%
7	10%	0.6	0.4	6.0	10.6%
8	10%	0.7	0.3	8.0	10.67%

$$WACC = k_d w_d + k_e w_e$$

$$\therefore k_e = \frac{WACC - k_d w_d}{w_e}$$

15 marks

Date: / /

Date: / /

Portfolio Management
Investment Analysis
Analysis of Risk and Return
 Investor's point of view
 minimize the risk

Portfolio / group of Investment

Note no 1 It is a collection of securities i.e. grouping of financial assets like stocks, bonds, debentures. Investor should construct portfolio in such a way that it spreads the risk and would seek to maximize the return.

Note no 2 Portfolio management
 It is a process of selecting bundle of securities that will provide maximum return for a given level of risk or alternatively ensure minimum risk for a given level of return.
 Therefore it is an art of selecting right combination of investment for the investor in terms of minimum risk and maximum return.

Note 3:- Measurement of Return.
 Return means the change in net value of investment either in terms of capital gain or in terms of dividend yield.

(i) Holding period return (HPR) (%):- Capital gain yield + Dividend yield

$$= \left(\frac{P_1 - P_0}{P_0} \right) + \left(\frac{D_1}{P_0} \right)$$

$$= \left(\frac{P_1 - P_0 + D_1}{P_0} \right)$$

(ii) Avg return / Mean return from the past data.

$$\bar{X} = \frac{X_1 + X_2 + X_3 + \dots + X_n}{n} \quad (\text{Sum of return})$$

(iii) Expected Return / Mean return from Probability

$$\bar{X} (E_r) = \text{Sum of } [\text{return} \times \text{Probability}]$$

$$E_r (\bar{X}) = \sum_{i=1}^n x_i \times P_i$$

Note no 4:- Measurement of risk.

- Risk is the possibility that expected return may not materialize
- It is measured by standard deviation of the return of securities. i.e. deviation from mean return.

Calculation of standard deviation

Step 1:- Compute σ^2
 Step 2:- Compute $\sigma = \sqrt{\sigma^2}$

$$\sigma = \sqrt{\frac{\sum (X - \bar{X})^2}{n}}$$

where,

$$\sigma^2 = \frac{\sum (X - \bar{X})^2}{n} \quad [\text{From Past Data}]$$

or,

$$\sigma^2 = \sum [(X - \bar{X})^2 \times \text{Probability}]$$

Note 1:- Standard deviation can't be computed straight away. The deviation from mean return from all the return is equal to zero.
 ∴ To eliminate the impact of sign we use square of deviations.

Note:- 2

Securities which has high S.D will be considered more risky security.

Note 3:- Standard deviation donot have it's own sign. Since return is expressed in percentage term. Standard deviation is also expressed in percentage terms.

Note:-

Note 4:- Why risk is reduced if we construct portfolio

= Due to co-relation coefficient.

↓

- Depends upon co-variance

↓

- Therefore to calculate correlation co-efficient, we first calculate co-variance.

Computation of co-variance between returns of security X and security Y

(i) From past data

$$\text{cov}(m_x, m_y) = \frac{\sum [(X-\bar{X}) \cdot (Y-\bar{Y})]}{n}$$

(ii) From the probability

$$\text{cov}(m_x, m_y) = \sum [(X-\bar{X}) (Y-\bar{Y}) \times \text{probability}]$$

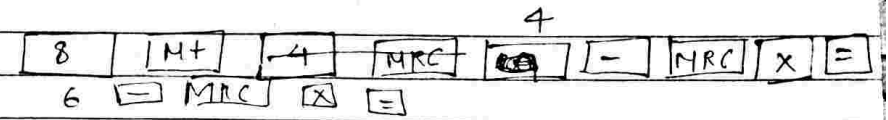
Calculation of correlation co-efficient between returns of security of X and security 'Y'

$$r(m_x, m_y) = \frac{\text{cov}(m_x, m_y)}{\sigma_m \times \sigma_y}$$

$$20M + 10 - MRC X =$$

Example:

Yr	Retn of X	Retn of security Y	$(X-\bar{X})^2$	$(Y-\bar{Y})^2$	$(X-\bar{X})(Y-\bar{Y})$
1	10%	4%	100	16	-10X-4 = -40
2	15%	6%	25	4	-5X-2 = -10
3	20%	8%	0	0	0X0 = 0
4	25%	10%	25	4	5X2 = 10
5	30%	12%	100	16	10X4 = 40
ΣX=100% ΣY=40%			250		
$\bar{X} = \frac{100\%}{5}$			$\bar{Y} = \frac{40\%}{5}$		
= 20%			= 8%		



$$\sigma_m = \sqrt{\frac{\sum (m-\bar{X})^2}{N}} = \sqrt{\frac{250(\%)^2}{5}} = 7.071\%$$

30*

$$\sigma_y = 2.83$$

Fujina Anal

$$\text{cov}(m_x, m_y) = \frac{\sum (X-\bar{X}) \times (Y-\bar{Y})}{N}$$

$$= \frac{100(\%)^2}{5} = 20(\%)^2$$

Fujina Anal

$$r(m_x, m_y) = \frac{\text{cov}(m_x, m_y)}{\sigma_m \times \sigma_y}$$

$$= \frac{20(\%)^2}{7.071\% \times 2.83\%} = +1$$

Fujina Anal

Qno 1

Price	Probability	
115	0.1	115 x 0.1
120	0.1	120 x 0.1
125	0.2	125 x 0.2
130	0.3	130 x 0.3
135	0.2	135 x 0.2
140	0.1	140 x 0.1
		<u>128.50</u>

$$\frac{P_1 - P_0}{P_0} + \frac{D_1}{P_0}$$

$$= \frac{128.5 - 120}{120} \times 100 + 0 \text{ (No dividend)}$$

$$= 7.083\%$$

Alternatively
Actual Sale

Computation of expected returns and standard deviations of returns

Situations	P ₁	P ₀	Returns $\frac{P_1 - P_0}{P_0}$	P _{ob}	RXP	(R - \bar{R}) ² X P
1	115	120	-4.17%	0.1	0.417	12.66
2	120	120	0%	0.1	0	5.02
3	125	120	4.17%	0.2	0.834	1.70
4	130	120	8.33%	0.3	2.5	0.47
5	135	120	12.5%	0.2	2.5	5.87
6	140	120	16.67%	0.1	1.67	9.19
					<u>7.083%</u>	<u>34.91</u>

∴ Expected Return = $\sum (\text{Return} \times \text{Probability})$

$$= 7.083$$

$$S = \sqrt{34.91}$$

$$= 5.91\%$$

Note 6: Portfolio Return (R_p)

It is simply the weighted average return of individual security.

The weight is based on investment amount i.e. market price value weight's. Therefore portfolio returns = $\sum (\text{Weight} \times \text{Returns})$

Note 7: Portfolio Risk (Combine the individual market)

Portfolio risk depends upon:-

- ① Weight of investment
- ② Co-reaction coefficient
- ③ Standard deviation

Total risk of a portfolio would be lower than the weighted average risk of individual security except when securities are perfectly positively co-related. Portfolio risk in case of two risky securities can be calculated as follows:-

Diversity
with risk
change
investment
div!

Standard deviation of portfolio (S)

$$= \sqrt{(w_1 \sigma_1)^2 + (w_2 \sigma_2)^2 + 2 w_1 \sigma_1 w_2 \sigma_2 r_{12}}$$

(Corr coeff bet'n them)

Qno 2

Computation of return and Risk of security A & B

i) Mean Return A (\bar{A}) = $\frac{10 + 16}{2} = 13\%$

Mean Return B (\bar{B}) = $\frac{12 + 18}{2} = 15\%$

ii) S of A = $\frac{\sum (X - \bar{X})^2}{n}$

$$S_A = \sqrt{\frac{(10 - 13)^2 + (16 - 13)^2}{2}}$$

$$= 3\%$$

Similarly,

$$\sigma_B = \sqrt{\frac{(12-15)^2 + (18-15)^2}{2}}$$

$$= 3$$

(2) Computation of covariance of return of security A and B

$$\text{cov}(A, B) = \frac{\text{Sum of } (A - \bar{A})(B - \bar{B})}{N}$$

$$= \frac{(10-13) \times (12-15) + (16-13) \times (18-15)}{2}$$

$$= 9\%$$

(3) Computation of co-relation coefficient between returns of sec A and security B

$$r(A, B) = \frac{\text{cov}(A, B)}{\sigma_A \times \sigma_B} = \frac{9}{3 \times 3} = 1$$

(4) Standard deviation of portfolio

Portfolio return (R_p) = Wt. avg returns of individual security

$$= 0.4 \times 13\% + 0.6 \times 15\%$$

$$= 5.2\% + 9\%$$

$$= 14.2\%$$

(5) Portfolio risk σ_p (Std. Deviation)

$$= w_A \sigma_A + w_B \sigma_B$$

$$= 0.4 \times 3\% + 0.6 \times 3\%$$

$$= 3\%$$

Note 8:- Security selection

- (i) When return of two securities are same but risk differs then select less risky security.
- (ii) When risk of two securities are same but return

$(-3 \times -3) + (3 \times 3)$
 $\frac{18}{2}$

$-3 \times -3 = 9$
 $3 \times 3 = 9$
 Date: / /

differs then select high return security.
 (3) When risk and return both differs then select that security that has lower coefficient of variation (V).
 $V = \frac{\text{Risk}}{\text{Return}}$

$$= \frac{6}{X}$$

However (V) criteria applies only if we have to select one security out of number of securities.

(4) When number of securities to be selected then selection shall be made in such a manner so that risk and return of securities will be in increasing trend.

Q no 6

Year	(In %) Return X	(In %) Return Y	$(X - \bar{X})^2$	$(Y - \bar{Y})^2$	$(X - \bar{X})(Y - \bar{Y})$
1	12	20	7.84	1	-2.8 X -1 = -2.8
2	8	22	46.24	1	-6.8 X 1 = -6.8
3	7	24	60.84	9	-7.8 X 3 = -23.4
4	14	18	0.64	9	-0.8 X -3 = 2.4
5	16	15	1.44	36	1.2 X -6 = -7.2
6	15	20	0.04	1	0.2 X -1 = -0.2
7	18	24	84.64	9	9.2 X 3 = 27.6
8	20	25	27.04	16	3.2 X 4 = 12.8
9	16	22	1.44	1	5.2 X 1 = 5.2
10	22	20	51.84	1	7.2 X -1 = -7.2
	$\Sigma X = 148$	$\Sigma Y = 210$	207.6	$\Sigma(Y - \bar{Y})^2 = 84$	-8
	$\bar{X} = 14.8$	$\bar{Y} = 21$			

Covariance (1,2) = $\frac{\text{Sum of } (R_1 - \bar{R}_1)(R_2 - \bar{R}_2)}{N}$

$$= \frac{-8}{10} = -0.8$$

Date: / /

$$\text{Standard deviation } (S_x) = \frac{\sum (X - \bar{X})^2}{N} = \sqrt{\frac{207.60}{10}} = 4.56$$

$$\text{Standard deviation } (S_y) = \frac{\sum (Y - \bar{Y})^2}{N}$$

$$= \sqrt{\frac{84}{10}}$$

$$= 2.9$$

Corr (1,2)
Cov X Y

$$r(1,2) = \frac{-0.8}{4.56 \times 2.9} = 0.061$$

Q no 7 (1) Computation of mean return of (ABC):

$$\begin{aligned} &0.2 \times 12 \\ &+ 0.25 \times 14 \\ &+ 0.25 \times -7 \\ &+ 0.30 \times 28 = 12.55 \end{aligned}$$

(2) Mean return of XYZ (Y)

$$0.2 \times 16 + 0.25 \times 10 + 0.25 \times 28 + 0.30 \times -2 = 12.10\%$$

(3) $S_{ABC} = \sqrt{\sum (X - \bar{X})^2 \times \text{Probability}}$

Risk

$$= \sqrt{(12 - 12.55)^2 \times 0.2 + (14 - 12.55)^2 \times 0.25 + (-7 - 12.55)^2 \times 0.25 + (28 - 12.55)^2 \times 0.30}$$

$$= 12.95\%$$

(4) $S_{XYZ} = \sqrt{(16 - 12.10)^2 \times 0.2 + (10 - 12.1)^2 \times 0.25 + (28 - 12.10)^2 \times 0.25 + (-2 - 12.1)^2 \times 0.3}$

$$= 11.27\%$$

$\frac{G}{X}$

(5) Return portfolio = equal mix 50% - 10.5

$$= 0.5 \times 12.55 + 0.5 \times 12.1$$

$$= 12.325\%$$

(6) $S_p = \sqrt{(0.5 \times 12.95)^2 + (0.5 \times 11.27)^2 + 2 \times 0.5 \times 12.95 \times 0.5 \times 11.27 \times -0.988}$

$$= 1.2574$$

(7) $r(ABC, XYZ) = \frac{\text{Cov}(ABC, XYZ) \times P}{S_{ABC} S_{XYZ}} = \frac{-14.25}{12.95 \times 11.27} = -0.988$

(8) $\text{Cov}(ABC, XYZ) = [(12 - 12.55) \times (16 - 12.1) \times 0.2 + (14 - 12.55) \times (10 - 12.1) \times 0.25 + (-7 - 12.55) \times (28 - 12.1) \times 0.25 + (28 - 12.55) \times (-2 - 12.1) \times 0.30]$

$$= -144.25$$

Requirement 3

For constructing minimum risk portfolio. The following conditions must be satisfied.

$$\text{Investment proportion in ABC} = \frac{S_{XYZ}^2 - \text{Cov}(ABC, XYZ)}{\text{Cov}(ABC, XYZ) + S_{ABC}^2 - S_{XYZ}^2}$$

Check $\text{weight}_{ABC} = \frac{127.04 + 144.25}{127.04 + 167.50 - 2 \times (-144.25)}$

$$= 0.465$$

$$\boxed{w_{ABC} + w_{XYZ} = 0.535}$$

{First HT lowest risk माके हेने}

Qno 5 Statement showing selection of securities

Risk	Security	Return	Selection
4	A	8	✓
4	D	4	X
5	B	8	X
5	E	9	✓
6	F	8	X
12	C	12	✓

Selection Process:-

- The minimum risk is 4%. We have two minimum risk securities, security A and D. We select security A with same risk but having high return.
- Now, security B is compared with security A and security B is rejected because it has same return but high risk.
- Again, security E is compared with security A. It has high risk and high return and hence it is selected.
- Then security F is compared with security E, it has high risk but lower return. Therefore it is rejected.
- Ultimately, security C is compared with security E. It has high risk and return. Hence it is selected.

Notes:-

Security Beta and Portfolio Beta

See Beta of security

Beta shows the proportionate risk in security as compared to the market risk.

Beta of the security measures sensibility of the security with reference of market portfolio i.e.

standard / benchmark.

Beta is a statistical concept and it can be computed as follows:-

$$\text{Beta (} \beta_s \text{)} = \frac{\text{Cov (} R_s, R_m \text{)}}{\sigma_m^2}$$

Again,
We have

$$r(R_s, R_m) = \frac{\text{Cov (} R_s, R_m \text{)}}{\sigma_s \times \sigma_m}$$

$$\text{Cov (} R_s, R_m \text{)} = (\text{correlation } r(R_s, R_m)) \times \sigma_s \times \sigma_m$$

$$\begin{aligned} \text{Therefore } \beta_s &= \frac{r(R_s, R_m) \times \sigma_s \times \sigma_m}{\sigma_m \times \sigma_m} \\ &= \frac{r(R_s, R_m) \times \sigma_s}{\sigma_m} \end{aligned}$$

Beta of the portfolio (β_p)

It can be calculated as weighted average betas of individual security. Weights are based on investment amount.

Qno 9

① Mean Return (M) = 10.67% $\left(\frac{12+11+9}{3}\right)$ ✓

② Mean Return (R) = 11.43% $\left(\frac{13.0+11.5+9.8}{3}\right)$ ✓

③ Mean Return (B) = 10.33% ✓

$$\begin{aligned} \text{④ } \sigma^2_m &= \frac{\sum (R_m - \bar{R}_m)^2}{N} \\ &= \frac{(12 - 10.67)^2 + (11 - 10.67)^2 + (9 - 10.67)^2}{3} \\ &= 1.55 \end{aligned}$$

equally likely variance cha 50%
and that is probability varjo aba.

5)
$$\text{Cov}(R_A, R_m) = \frac{\sum (R_A - \bar{R}_A) \times (R_m - \bar{R}_m)}{N}$$

$$= \frac{(13 - 11.43)(12 - 10.67) + (11.5 - 11.43) \times (11 - 10.67) + (19.8 - 11.43) \times (9 - 10.67)}{3}$$

$$= 1.61$$

6)
$$\text{Cov}(R_B, R_m) = \frac{\sum (R_B - \bar{R}_B) \times (R_m - \bar{R}_m)}{N}$$

$$= \frac{(11 - 10.33)(12 - 10.67) + (10.5 - 10.33) \times (11 - 10.67) + (9.5 - 10.33) \times (9 - 10.67)}{3}$$

$$= 0.67 \times 1.33 + 0.17 \times 0.37$$

$$= 0.78$$

7)
$$\beta_A = \frac{\text{Cov}(R_A, R_m)}{\sigma^2_m}$$

$$= \frac{1.61}{1.53}$$

$$= 1.04$$

8)
$$\beta_B = \frac{\text{Cov}(R_B, R_m)}{\sigma^2_m}$$

$$= \frac{0.78}{1.53}$$

$$= 0.51$$

Risk	Return		
5	U	10	✓
5	X	5	✗
6	Y	11	✓
6	V	10	✗
7	Z	10	✗
13	W	15	✓

Qno 10 U, W, Y, X

Qno 10

- Mean return market $(R_m) = 16\%$
- Mean return $(A) = \frac{4 + 40}{2} = 22\%$
- Market return dependence $(D) = 13.5\%$

4)
$$\sigma^2_m = (7 - 16)^2 \times 0.5 + (25 - 16)^2 \times 0.5$$

$$= 81$$

5)
$$\text{Cov}(A, m) = (4 - 22) \times (7 - 16) \times 0.5 + (40 - 22) \times (25 - 16) \times 0.5$$

$$= 162$$

7)
$$\text{Cov}(D, m) = (9 - 13.5) \times (7 - 16) \times 0.5 + (18 - 13.5) \times (25 - 16) \times 0.5$$

$$= 40.5$$

8)
$$\beta_A = \frac{162}{81} = 2$$

9)
$$\beta_D = \frac{40.5}{81} = 0.5$$

10) SML equation (CAPM)
$$= R_F + \beta (R_m - R_F)$$

$$= 7.5 + \beta (16\% - 7.5\%)$$

(Qno 11 and 12 not to be done)

Qno 13

1) Portfolio Beta $(\beta_p) = \text{wtd. Avg of } \beta \text{ of ind security}$

$$= 0.45 \times \frac{0.8}{9.05} + 0.35 \times \frac{1.50}{9.05} + 1.15 \times \frac{2.25}{9.05} + 1.85 \times \frac{4.50}{9.05}$$

$$= 1.3035$$

2) Portfolio Return $(R_p) = \text{wtd. Avg Return of Individual Security}$

$$R_p = R_F + \beta_p (R_m - R_F)$$

method is gain

$$= 7\% + 1.3035 (14\% - 7\%)$$

$$= 16.1245\%$$

Alternative soln:-

Portfolio return

$$\begin{aligned}
 (R_p) &= \text{wtd. Avg Return of Ind security} \\
 &= \frac{10.15 \times 0.8}{9.05} + \frac{9.45 \times 1.5}{9.05} + \frac{15.05 \times 2.25}{9.05} \\
 &= \frac{19.95 \times 4.5}{9.05} \\
 &= 16.1245.
 \end{aligned}$$

WV - No 1

Ind Return

$$\begin{aligned}
 \text{OXY Return} &= 7 + 0.45 \times 7 = 10.15\% \\
 \text{Boxed} &= 7 + 0.35 \times 7 = 9.45\% \\
 \text{Sq} &= 7 + 1.15 \times 7 = 15.05\% \\
 \text{Elligoo} &= 7 + 1.85 \times 7 = 19.95\%
 \end{aligned}$$

Portfolio Beta = ?

$$\begin{aligned}
 16.1245 &= 7\% + B(7\%) \\
 0.4 \cdot B &= \frac{9.1245}{7\%} = 1.3035
 \end{aligned}$$

Qno 14 16% g=12% D0=3 per share Rm=15% Rf=10%
B=1.2

$$\begin{aligned}
 k_e &= R_f + B(R_m - R_f) \\
 \text{Price} &= \frac{D_1}{k_e - g} = 10 + 1.2(15\% - 10\%) = 16
 \end{aligned}$$

~~$$\begin{aligned}
 D_1 &= 3.6 \\
 k_e &= 12\% \\
 0.03 + 0.12 &= k_e \\
 0.15 &= k_e \\
 16 &= \frac{3(1+0.12)}{0.15} + 0.12 \\
 P_0 &= ?
 \end{aligned}$$~~

Qno 15

$$\begin{aligned}
 \bar{X}_A &= 22\% & \bar{X}_B &= 24\% \\
 \sigma_A &= 40\% & \sigma_B &= 38\% \\
 \beta_A &= 0.86 & \beta_B &= 1.24 \\
 r(\text{ABS}) &= 0.72 \\
 G_m &= 20\%
 \end{aligned}$$

(i) Yes, investing in B Ltd is better in terms of risk as well as return perspective since B Ltd has high return as well as lower risk as compared to A Ltd.

(ii) $R_p = 0.7 \times 22 + 0.3 \times 24 = 22.6\%$
 (iii) $G_p = \sqrt{(0.7 \times 40)^2 + (0.3 \times 38)^2 + 2 \times 0.7 \times 40 \times 0.3 \times 38 \times 0.72}$
 $= 37.06\%$

(iii) We have,

$$\begin{aligned}
 22\% &= R_f + 0.86(R_m - R_f) \quad \text{--- (1)} \\
 24\% &= R_f + 1.24(R_m - R_f) \quad \text{--- (2)} \\
 -2\% &= 0.86(R_m - R_f) - 1.24(R_m - R_f) \\
 \text{or, } 2\% &= 0.38(R_m - R_f) \\
 \frac{2}{0.38} &= R_m - R_f
 \end{aligned}$$

or, $5.26 = R_m - R_f$
 Putting the value of $R_m - R_f$ in eqn (1) we get,
 $22\% = R_f + 0.86 \times 5.26$
 $\therefore R_f = 17.48\%$

$R_m = 17.48 + 5.26 = 22.74\%$

(iv) $B_p = \text{wt Beta}$
 $= 0.7 \times 0.86 + 0.3 \times 1.24$
 $= 0.974$

17 a) Portfolio $\beta = 0.2 \times 1.6 + 0.2 \times 1 + 0.2 \times 0.9 + 0.2 \times 2 + 0.2 \times 0.6$
 $= 1.22$

b) β of portfolio = 0.15×1.6 (A)
 $+ 0.3 \times 1.0$ (B)
 $+ 0.15 \times 0.9$ (C)
 $+ 0.3 \times 2.0$ (D)
 $= 0.1 \times 0.6$ (E)
 $= 1.335$

c) Expected return.
 ① case = $1.22 \times 1.22 = [0 + 1.22(12\% - 0)] = 14.64\%$
 ② 2nd case = $1.335 \times 1.22 = [0 + 1.335(12\% - 0)] = 16.02\%$

CAPM (Capital asset pricing method)

CAPM assumes that return should be based on risk involved in security. It can be used to make decisions relating to buy, hold or sell the securities. The required return as per CAPM can be computed as:-

Q15

Required return $= R_f + \beta(R_m - R_f)$

The required return is compared with expected return i.e. available return and decision is taken accordingly. The decision rule is as follows:-

Situation	Valuation	Decision
① $RR > AR$	Overpriced	Sell
$RR < AR$	Underpriced	Buy
$RR = AR$	Fairly priced	Buy/Hold

Required return Available return
 ① $RR > AR$ but pogo 1st. So the lidainoo hami kstai bechhau

Qno 23

Stocks	Reqd. β (APM)	Return Available	Valuation	Decision
A	17.5	18	Underpriced	Buy
B	12	11	Overpriced	Sell
C	15	15	Fairly priced	Hold

Risk kamina underpriced
 (Expected) $\frac{(14-9)}{5 \times 1.70 + 9} = 17.5$

Qno 19

Soln:-
 Existing situation
 $K_e = R_f + \beta(R_m - R_f)$
 $= 10 + 1.4 \times 6 = 20.4$
 $D_0 = 2$
 $g = 5\%$
 $D_1 = 2 \times 1.05$ $D_0(1+g) = 2(1+0.05) = 2.1$
 $= 2.1$
 Fair Price = $\frac{D_1}{K_e - g}$
 $= \frac{2.1}{0.204 - 0.05} = 13.36$

Market risk premium $R_m - R_f$
 (R_f is greater than R_m)

Revised situation

$K_e = R_f + \beta(R_m - R_f)$
 $= 10 + 1.25 \times 4 = 15\%$
 $g = 9\%$
 $D_1 = 2 \times 1.09$
 $= 2.18$
 Fair price = $\frac{2.18}{0.15 - 0.09} = 36.33$

Revised

Qno 20
 Analyse manual Qno 4, 2

Decision:- If we consider revised factor, the price would be Rs 36.33 in future and investor should hold share to gain price appreciation. In addition investor can also purchase the share to gain future advantage.

Cash again cash mai kasan cycle chalna start with estimation of WC first.
 (Debit) (Credit) (WC) → These are current assets
 mat is w/cm

x 4 Working Capital Management

~~Imp~~ # Receivable / Debtors Management

Wealth mgmt x

Focus on profit maximization ✓

Whome to sell? → to whome credit sell shall be given - credit analysis
 How much time? How much goods? shall be given

Credit sales ⇒ advantages & disadvantages.

Noteno1:- Receivable / Debtors

It means debts owed to the firm by customers for selling goods and services on credit.
 Also known as account receivable or bills receivable.

Noteno2:- Receivable Management

It is a process of making decisions relating to following matters:-

- (i) To whome credit is given?
 It involves credit analysis and checking of credit worthiness of customers.
- (ii) How much credit is given?
 It involves determination of credit amount to debtors.
- (iii) How long credit is given?
 It involves determination of credit period.

The objective of receivable management is to ensure that benefits from managing receivable should be more than the cost to manage it.

Debtors management gina ~~cost~~ ~~bad~~ ~~cost~~ ~~bad~~

Debtors ma fasakte paisa jun hamile lera aayeko no.
 Cash cost ⇒ Sales price less profit indulged in it.

Note3:- Cost and benefits of managing receivables

- (i) Benefits of managing receivables
 Contribution or profit on increased sales unit.
- (ii) Losses or cost of managing receivables
- (1) Bad debt (It is always valued on sales value).
- (2) Cost of fund blocked in debtors / Opportunity cost.

$$\text{Cost of fund blocked in debtors} = \frac{\text{Cash cost of debtors}}{\text{of debtors}} \times \frac{\text{Credit period}}{360} \times \text{Rate used} \times 12$$

Cost of fund blocked in debtors

Step (1) ★ Funds blocked in debtors = $\frac{\text{Cash cost of sale}}{\text{sale}} \times \frac{\text{Credit period}}{360} \times 12 \times 52$

Step (2) ★ Cost of fund blocked in debtors = $\frac{\text{Funds blocked in debtors}}{\text{in debtors}} \times \text{Required rate of return p.a.}$

(Investment in debtors)

- (3) Cost of credit administration
 - (a) Cost of record keeping
 - (b) Investigation of credit worthiness
- (4) Collection cost

Cost of contacting customers. collecting cheques / cash in person.

$$23 \times 20\% \times \frac{1}{12}$$

$$26 \times 20\% \times \frac{2}{12}$$

- (a) Outstanding collection charges
 (b) legal charges in respect of cases pending against debtors

Qno 30 Statement showing evaluation of credit policies:-

Existing Policy (1 month (r))	Prop Policy-1 (2 months credit (15%))	Proposed Policy-2 (3 months (r))
Sales:- 30,00,000	34,50,000	39,00,000
(-) Variable cost 20,00,000	23,00,000	26,00,000
(-) Fixed cost 3,00,000	3,00,000	3,50,000
Bad debt (1%) 30,000	1,03,500	1,95,000
Available return 67,00,000	74,65,000	75,51,000
less:- Required 38333	86667	37350
return or opportunity cost / Cost of fund blocked in debtors.		
Not gain:- 66666		
6,31,667	6,59,333	6,07,500

Bad debt not part of cost of fund blocked in debtor

Working note 1

Cost of fund blocked in debtors

Existing policy

Step 1:- Funds blocked in debtors:-

(ash cost of x Cr Period

$$= \frac{\text{Sales} \times \text{Cr Period}}{12}$$

$$= \frac{23,00,000 \times 1}{12}$$

$$= 1,91,667$$

no. $\frac{24 \text{ am } 20 \times 100}{\text{Avg am}}$

Step-2 Cost of funds blocked in debtors

$$191667 \times 20\%$$

$$= 38333.$$

Decision:- The credit policy should be fixed at 2 months since in the policy net gain is highest.

Qno 31 Soln:- $20 \times 60\% = 12$

Statement ---

	Existing 1 month	2 months	3 months
Sales	40,00,000	44,00,000	52,00,000
(-) Variable cost (60%)	24,00,000	26,40,000	31,20,000
(-) Fixed Cost	5,00,000	5,00,000	5,00,000
Available Return	11,00,000	12,60,000	15,80,000
Required rate of return	48333	104667	181000
	1051667	1155333	1399000
		103666	347333

Working note.

$$24 + 5 = 29 \quad 29 \times 20\% \times \frac{1}{12}$$

Qno 32

	Existing 45 days	56 days	60 days	75 days	90 days
Sales:-	50,00,000	50,00,000	50,00,000	50,00,000	50,00,000
(-) Variable (80%)	40,00,000				
HFC.	6,00,000				

$$\frac{46,00,000}{365} \times \frac{45}{365} \times 20\%$$

Account Receivable Turnover Ratio

It can be calculated as follows:-

$$\text{A/C Receivable Turnover Ratio} = \frac{\text{No of days in a year}}{\text{Credit period (days)}}$$

or,

* The A/C receivable turnover ratio and credit period has opposite relation.

$$\therefore \text{Credit period} = \frac{\text{No of days in a year}}{\text{A/C Receivable turnover ratio}}$$

when credit period increases i.e. credit is relaxed the A/C receivable turnover ratio decreases and vice-versa.

Example:-

Case	I	II	III	IV
Credit period in days	30	45	60	90
A/C receivable turnover ratio	12	8	$\frac{360}{60} = 6$	$\frac{360}{90} = 4$

Again,

$$\text{Amount blocked in debts} = \frac{\text{Annual cost}}{360} \times \text{Credit Period}$$

or,

$$\text{Amount blocked in debts} = \frac{\text{Annual cost}}{\text{A/C receivable turnover ratio}}$$

Qno 35

cycle In (4) 360
 360
 Date: / /

Qno 35 Statement showing evaluation of credit proposal

Existing	Existing	Proposal-1	Proposal-2
Sales:-	225	275	250
(-) Variable cost @ 60%	135	164.5	210
(-) Bad debt	7.5	22.5	47.5
Available return before tax	82.5	87.5	92.5
(-) Opportunity cost	5.4	8.25	14
	77.1	79.25	78.5

Working note no 1

Existing situation:-

A/C receivable turnover ratio = 5 times; Month in a year = 12

$$\text{Credit period} = \frac{12}{5} = 2.4 \text{ month.}$$

$$\therefore \text{Amount blocked in debtors} = \frac{135 \times 2.4}{12} = 27 \text{ lakh}$$

$$\text{Required rate} = 27 \times 20\% = 5.4$$

$$\text{Next method} \therefore \frac{135}{5} = 27 \text{ Amt blocked.}$$

Working note 2

$$\text{Amt blocked in debts} = \frac{165}{4} = 41.25$$

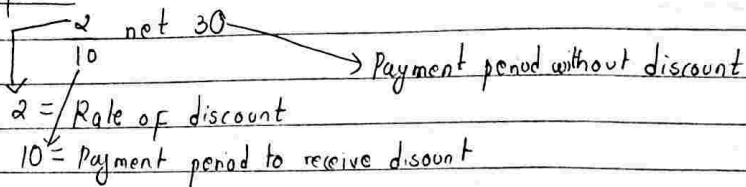
$$\text{Now, Reqd opp cost} = 41.25 \times 20\% = 8.25$$

Existing (1 month period)	Proposed (2 month)
Sales:-	2362,500
(-) Variable cost @ 14	15,75,000
(-) Fixed cost @ 4	3,60,000
	41,27,500
(-) Opp cost (RR)	1,29,000
Net gain	29,65,000

Discount is not part of cost of fund blocked in debtor.

Note:- Expression of discount and payment period.

Example:-



Qno 40 Statement of evaluation of credit proposed

Sales: Existing (1/10 net 30) Proposed-2 (2/10 net 30)

Sales:-	80	85
(-) Variable cost @ 85%	68	72.25
(+) Fixed cost @ 10%	8	(80 x 8.5%) = 68
(-) Discount (40,000/111)	0.4	(68 x 2%) = 1.36
Available cash	3.6	3.39
Desir. Opp. cost	0.42222	0.31208
	3.1778	3.07792

68.8 x 10% = 7.6 0.09986

7.6 x 20 / 360 = 0.42222

80.25 x 14 / 360 x 10% = 0.31208

∴ Incremental loss = 99986

Qno 39 Existing (1/10 net 45) Proposed-2 (2/10 net 45)

(-) Bad debt

Contribution = 22% of Sales

Contribution = 22% of Sales

Sales - Variable cost = 22% of sales

∴ Sales - 22% of sales = Variable cost

1.22 of sales = Variable cost

Contribution = 22% of Sales

Date: 50 x 10 = 500
0.5 x 45 = 22.5
275
IF hamirai 30 days made to you we need to calculate it.

Qno 39

	Existing (1/10 net 45)	Proposed-2 (2/10 net 45)
Sales	12 lakh	15 lakh
(-) Variable cost	9.36 lakh	12.48 lakh
Contribution	2.64 lakh	3.52 lakh
(-) Bad debt	0.18 lakh	3.52 lakh

	Existing	Proposed-2
Sales	12	16
(-) V.C	9.36	12.48
(-) Bad debt	2.64	0.32
(-) Discount (12 x 50/111)	0.06	0.256
Net profit before tax	2.04	2.944
loss tax @ 30%	240,000	294,400
NET profit after tax	204,000	259,240

Opportunity cost of investment before tax = 15% = 15 x (1-0.3)

Opportunity cost after tax = 10.5%

(+) Opp. cost = 8190 = 159810

12.48 x 10.5% x 20 / 360 = 7280

∴ Proposed should be taken

50 n - x
20 n

Q no 487

	Existing	Purposed 20% → Beckdina
Sales (5000 X 1000)	50 lakh	40 lakh
(-) Variable (750 X 5000)	37.5	30 30
(-) Bad debt	5	10
(Net gain)	7.5 lakh	- 2.5
Opp cost	0.9375	0.75
Net gain	6.5625	- 0.75
	$37.5 \times \frac{2}{12} \times 15\% = 0.9375$	6.75

$30 \times \frac{2}{12} \times 15\% = 0.75$

Should be accepted.

55

50 chavane 20% wala ta 1/2 fauta x 1000 net 30
2/10 net 30

Sales:-	7,20,000	7,40,000
(-) V.C	504,000	5,18,000
(-) Bad debt	14,400	14,800
(-) Discount	-	74,000
Available ^{relun} Net gain	2,01,600	1,99,800
Opp cost @ Tax @ 50%		
(-)	1,00,800	99,900
(-) Opp cost	42,000	2,878
	96,600	97,022

$504000 \times \frac{30}{360} \times 10\% = 4200$

Q no 49

(i) The customer class A will not purchase more T.V sets ^{even?} if credit is extended hence it is recommend not to provide any credit to customer class A.

(ii)

Determination of Cr Period of customer class 'B' (Rs in lakh)

Cr Period	0	30	60	90
Sales	90	135	180	225
(-) Variable lost	72	108	144	180
∴ Available _{relun}	18	27	36	45

∴ Opp cost	0	1.8	4.8	9
Net gain	18	25.2	31.2	36

For 30 day $108 \times \frac{30}{360} \times 20\% = 1.8$
Highest net gain = 36.

Credit period to B is 90 days.

(iii)

Determination of Cr. Period to 'C'

Cr Period	0	30	60	90
Sales	-	-	90	135
(-) Variable cost	-	-	72	108
Available relun	-	-	18	27
∴ Required relun	-	-	2.4	5.4

For 60 day = $72 \times \frac{60}{360} \times 20\% = 2.4$

(b)

∴ Cr. per. to 90 days.
By providing credit of 90 days to B and (and no credit to A, may cause to stop purchase TV sets from company by customer A.

Qno 54 Evaluation of statement showing credit proposal

	Existing sit	Proposed situation
	(net 30)	($\frac{2}{10}$ net 30)
Sales	10,00,000	11,00,000
(-) Variable cost	5,00,000	5,50,000
(-) Fixed cost	2,00,000	2,00,000
(-) Discount	-	11,000
(Available return	3,00,000	3,39,000
loss:- Required return	11667 (WN-1)	12333
Net gain	28833	32667

W.N : $7,00,000 \times \frac{30}{360} \times 20\% = 11667$

WP-2 $7,50,000 \times \frac{20}{360} \times 20\% = 8333$

$20,000 \times 20\% = 4000$
12333

Note:- If question provides increased working capital due to additional sales, opportunity cost should be calculated on total funds blocked in working capital. i.e. Amt blocked will be

- (i) Amt blocked in debtors/receivables xxx
- (ii) Working capital increased xxx
- Total working capital required xxx

Qno 38 Note

Cash discount policy:-

If a supplier provides cash discount offer for making prompt payment within the specified period buyer should compare the opportunity

Qno 38 cost of forgone cash dividend (i.e. cost of credit or implicit rate of interest) with the cost of other source of credit for decision.

The annual opportunity cost of (forgone cash discount or annual cost of credit) can be computed as follows.

Effective cost of credit = $\frac{\% \text{ of cash discount} \times 360}{100 - \% \text{ of cash discount} \times (\text{credit period} - \text{Discount period})}$

Cash discount can be chosen if annual cost of credit is higher than the other source of credit.

Example:- A Ltd buys goods of 5 lakhs on credit terms of ($\frac{2}{10}$ net 40). Should A Ltd avail cash discount if it can borrow

- (a) 18% rate p.a
- (b) 30% rate p.a.

Assume 360 days in a year.

Soln:-

Annual cost of credit = $\frac{\% \text{ of C.D} \times 360}{100 - \% \text{ of C.D} \times (\text{Credit period} - \text{Discount period})}$

5,00,000 to loan liye 30 din 2% discount 30 din

4,90,000 24.5. $5,00,000 = \frac{2}{100-2} \times \frac{360}{40-10} \times 100$

4,90,000 aja ko din ma use gureta 10 hajar badi time.

= 24.5%

Qno 38 Soln:-
 Note:- Assume $\frac{\text{days}}{365}$ in a year.

$$= \frac{2}{100-2} \times \frac{365}{60-20}$$

$$= 18.62\% \text{ p.a.}$$

98 rupee 40 din use gungo vane rate dila 50 8?

Qno 37 Aba ma Supplier ho
 EIR = $\frac{\% \text{ ask dir}}{100 - \% \text{ of cost dir}} \times \frac{365}{\text{Credit period} - \text{Discount paid}}$

$$18.62\% = \frac{2}{100-2} \times \frac{365}{\text{Credit period} - 10}$$

$$0.1862 = \frac{730}{98m - 980}$$

$$0.1862(98m - 980) = 730$$

$$18.2476m - 182.476 = 730$$

$$m = 50 \text{ days.}$$

∴ Credit term = $\frac{2}{10}$ net 50.

$$0.0828 = \frac{730}{98m - 980}$$

$$8.1144m - 0.0828 = 730$$

$$m = 100 \text{ days.}$$

Qno 43 24% net 30

$$0.24 = \frac{m}{100-m} \times \frac{365}{30-0}$$

$$24 - 0.24m = 12.1667m$$

$$\therefore m = 1.9340.$$

Qno 37 Evaluation of credit proposal to slow payers

Sales :-	15,00,000
(-) Variable cost (150x5)	14,50,000
(-) Remaining expenses	5,000
(-) Bad debt	15,000
Available return	30,000
(-) Required return / opp cost	69503
Net gain	(39503)

Working note

$$\text{Average collection period} = 0.15 \times 30 + 0.34 \times 60 + 0.30 \times 90 + 0.20 \times 100$$

$$= 71.9 \text{ days}$$

$$\text{Opp cost} = 14,50,000 \times \frac{71.9}{360} \times 24\%$$

$$= 69503$$

Not to sell goods to because there's loss.

Decision-Tree Analysis of Credit Granting

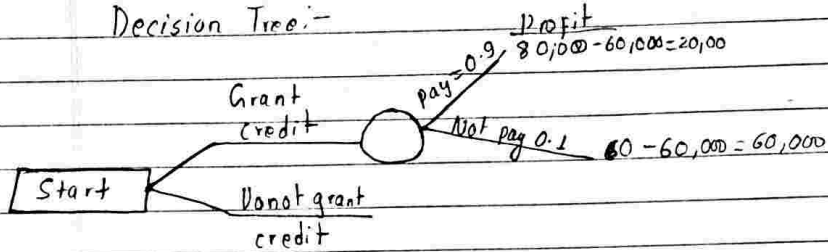
- It is a graphic device that shows a sequence of strategic decisions and expected consequences under each possible set of circumstances.
- The role of decision tree is "draw from left to right and evaluate from right to left."
- The decision whether to grant credit or not is made on the basis of expected net benefits.
- When a customer pays seller's makes profit (sales - cost of sales i.e. profit) and when he fails to pay, the seller incurs loss equals to the cost of

sales. The chance of payment or default i.e. probability and financial consequences (i.e. profit or loss) is shown in decision tree and decision is made on the basis of expected net benefits.

Qno 45

Soln:-

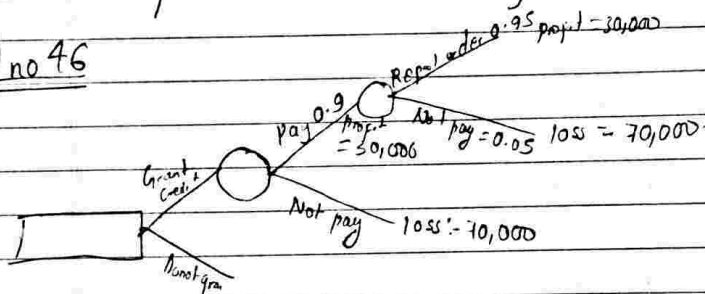
Decision Tree:-



$$\text{Expected benefits} = 0.9 \times 20,000 - 0.1 \times 60,000 = \text{Rs } 12,000$$

Therefore credit should be granted.

Qno 46



$$\text{Expected benefits} = 30,000 \times$$

Repeat order:-

$$\text{Original order} = 0.95 \times 30,000 - 0.05 \times 70,000 = 25,500$$

$$\text{Original order} = (25,000 + 30,000) \times 0.9 - 0.1 \times 70,000 = 42,500$$

∴ Expected profit for credit grant = 42,500
Hence credit should be granted.

Factoring

It is a process by which company generates finance against its debtors/receivables. It is an arrangement for collecting credit invoices.

Factor

Specialist / Experts of handling receivables.

Factor may be a firm or commercial bank or financial agency. Factor provides following two services

- ① Management of receivables
- ② Advance / Finance / loan against receivables.

Cost of factoring

- ① Commission for management of receivable. (Commission is always up-front (advance)).
- ② Interest for financing receivable.

Benefits of Factoring

- ① Reduction in management cost.
 - Bad debts, collection cost and other cost.
- ② Release of working capital blocked in receivable due to additional finance.

Types of factoring

- ① Re-course factoring

Bad-debt will be born by company and not by factor

- ② Non-re-course factoring

Bad-debts will be born by factor.

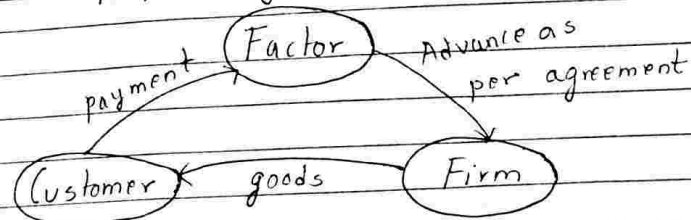
- ③ Bulk or agency factoring

Factor only finances the receivables. Management of receivables will be done by company itself.

collateral
Debtor lai 212000
Paisa line or loan
Debtor manage
ganna di
Factor lai appoint
Date

(iv) Non-notification factoring
Factors appointment is not notified to customers.

Process of factoring



Effective cost of factoring

$$\text{Effective cost of factoring} = \frac{\text{Net cost of factoring} \times 100\% \times \frac{360}{360/90}}{\text{Net advance/loan received}}$$

Example:-

Credit sales = 12,00,000

Avg collection period = 3 months

Factoring reserve = 20%

Factoring commission = 4%

Bad debts = 2%

Collection expenses = Rs 20,000

Interest rate = 18% p.a

Effective cost of factoring = ?

Soln:-

(1) Net Advance (loan) Received:-

(i) Average Debtors = $12,00,000 \times \frac{3}{12}$

= 3,00,000

Average Debtors = 3,00,000

(ii) less:- Factoring reserve = $3,00,000 \times 20\% = \text{Rs } 60,000$

(iii) less:- Commission = $3,00,000 \times 4\% = 12,000$

(iv) Gross Advance 2,28,000

(v) less:- Interest : $2,28,000 \times 18\% \times \frac{3}{12}$ 10,260

(vi) Net advance received 2,17,740

(2) Net cost of factoring

(i) Commission (3 months) 12,000

(ii) Interest (3 months) 10,260

(iii) Gross cost of factoring 22,260

(iv) less:- Saving in collection expenses 50,000 (20,000 + 30,000)

(v) less:- Saving in bad debts 6,000

(Assuming non-recourse factoring) (3,00,000 \times 2\%)

(vi) Net cost of factoring 11,260

(3) Effective cost of factoring = $\frac{\text{Net cost of factoring} \times 100\%}{\text{Net Advance loan received}}$
(3 months at)

= $\frac{11,260}{2,17,740} \times 100\%$

= 5.17%

\therefore Annual cost of factoring = $5.17 \times \frac{12}{3}$
(12 months at)

= 20.68%

Qno 49

Avg Debtors = $12,00,000 \times \frac{90}{360}$

= 3,00,000

(-) Factoring reserve = $3,00,000 \times 10\% = 30,000$

(-) Commission = $3,00,000 \times 2\% = 6,000$

(iv) Gross Advance	264000
(v) less Interest $264000 \times 10\% \times \frac{90}{360}$	10560
(vi) Net Advance Received	253440

(2) Net cost of factoring
 Commission (90 days) = 6000
 Interest (90 days) = 10560

(iii) Gross cost of factoring = 16560

(iv) less: saving in collection expense (90 days) $50,000 \times \frac{90}{360}$ = 12,500

(v) less: Saving in bad debt (Assuming recourse factoring)

(vi) Net cost of factoring = 4060

(3) Effective cost of factoring (3 months)
 $\frac{\text{Net cost of factoring} \times 100}{\text{Net Advance Received}}$
 $= \frac{4060 \times 100 \times \frac{360}{90}}{253440}$ (360 days of E. amount at)
 $= 6.4\%$

Q no 48 (i) Average debtor = $3,60,00,000 \times \frac{30}{360}$

= 30,00,000

(-) Factoring reserve (10% of 30,00,000) 300,000

(-) Interest (commission) (1% of 30,00,000) 30,000

Gross Advance 26,70,000

(-) Interest (15% of 26,70,000 $\times \frac{30}{360}$) 1,01,250

Net Advance Received 25,68,750

(1) Net cost of factoring
 Commission (30 days) = 30,000
 Interest 130 days = 33,375
 (i) Gross cost of factoring = 63,375
 (-) (ii) less: Saving in collection expenses $1,40,000 \times \frac{30}{360}$ 11,666.67
 (-) (iii) less: Saving in bad debt $3,00,000 \times 2\% \times \frac{30}{360}$ 6000
 Net cost of factoring = 8292

(3) Effective cost of factoring (30 days)
 $= \frac{\text{Net cost of factoring}}{\text{Net Advance Received}} \times 100 \times \frac{360}{90}$
 $= \frac{8292 \times 100 \times 360}{256875 \times 90}$
 $= 21.25\%$

For the factoring the gross cost would take Rs 63,375 but and for the normal procedure of business it would take Rs 71,667

Calculation of cost if factoring is not taken
 ✓ Bud debt 60,000
 'Adm' cost 11,667
 71,667

Factoring sare kai ramro 63375 vs 71667
 Factoring ma kam kharcha laycha.

Cash-management

① Meaning

- Cash is the oil that lubricates wheels of the business. The firm should maintain sufficient (optimum) cash balance to meet its financial obligations.
- Holding more cash ^(reduces) lowers firms potential earnings, since it attracts some ^{short term} cost of funds and low cash attracts risk of ^{short term} insolvency. Therefore organization shall maintain optimum cash balance.

② Need to hold cash

- Transactional need (For business operation)
- Speculative need (To grab unexpected opportunities)
- Contingency need (Unexpected requirements like strike, earthquake and other unpredicted reason)

③ Models / Theories of Cash Management

(i) Baumol Model

- Suggested by William J Baumol
- Similar to Wilson's model of Raw materials (EOQ)
- As per this model optimum cash withdrawal size is that level of cash withdrawal where total transaction cost and opportunity cost are minimum and equal.
- The optimum ^{cash} withdrawal size can be calculated as below:-

$$C = \sqrt{\frac{2AT}{I}}$$

↓
Optimum cash withdrawal size

↓
Annual cash requirement / disbursements

↓
Interest rate per rupee per annum

↓
Transaction (Fixed) cost per transaction

Assumption

- Uniform cash requirement
- Fixed transaction / conversion cost.
- Fixed rate of cash holding cost.
- Free marketability of short term security.

Qno 22

Annual cash requirement (A) = 24 lakhs

$$I = 0.1$$

$$T = 150$$

$$C = \sqrt{\frac{2AT}{I}}$$

Optimal cash balance

$$C = \sqrt{\frac{2 \times 24 \times 150}{0.1}}$$

$$= 84853$$

Qno 23

$$C = \sqrt{\frac{2 \times 12,60,000 \times 20}{0.08}}$$

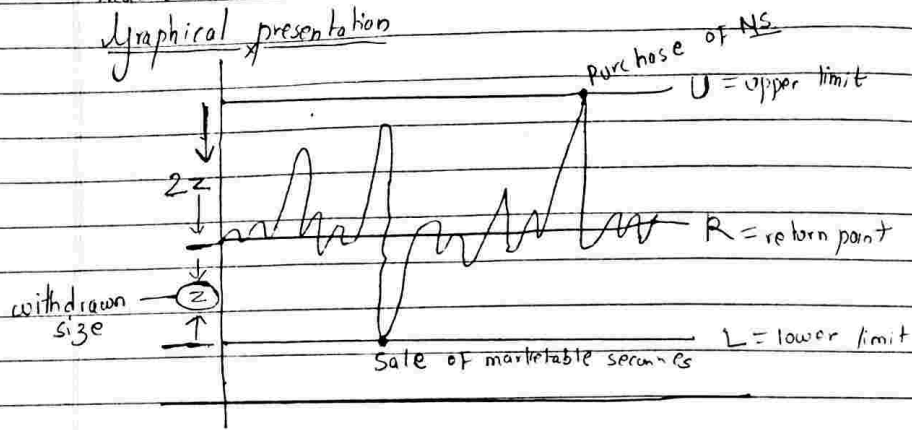
$$= 25099.800$$

~~Qno 24~~

Miller - Oer Model (Cash requirement fixed hundana, variance aacha, past experiences hono bat)

- Requirement of cash is not uniform during the year.
- Upper and lower limits can be fixed for cash balances by considering likely fluctuation in cash.
- When cash balance reaches the upper balance limit surplus cash is invested in marketable securities and similarly when cash balances touches the lower limit, marketable securities are disposed off, and cash balances are kept at return level.
- During the period when cash balance stays between high & low limits there are no transactions between cash and

marketable securities
graphical presentation



$$z = \sqrt[3]{\frac{3TV}{4I}}$$

OR

$$\left(\frac{3TV}{4I}\right)^{\frac{1}{3}}$$

where, T = Transaction cost.

V = Daily cash flow variance (₹)

I = Daily interest rate.

Soln:-

Q no 24 Given: Interest Rate (I) = 0.02% per day

Daily cash flow variance (V) = ₹ 50,000

Transaction cost (T) = ₹ 45

Cash size (z) = ?

We have,

$$z = \sqrt[3]{\frac{3TV}{4I}}$$

$$= \sqrt[3]{\frac{3 \times 45 \times 50,000 \times 50,000}{4 \times 0.02}}$$

$$= \sqrt[3]{\frac{3 \times 3 \times 3 \times 5 \times 5 \times 10,000 \times 5 \times 10,000}{4 \times \frac{2}{1000}}}$$

$$= \sqrt[3]{\frac{3 \times 3 \times 3 \times 5 \times 5 \times 5 \times 10,000 \times 10,000 \times 10,000}{2 \times 2 \times 2}}$$

$$= \left(\frac{3 \times 5 \times 10,000}{2}\right)^{\frac{1}{3}}$$

$$= 75,000 \text{ ₹}$$

$$P = L + z = 100,000 + 75,000 = 175,000$$

$$U = L + 3z = 100,000 + 3 \times 75,000 = 325,000$$

Commercial paper

- Short term money market instrument. Issued at discount and redeemed at face value.
- Unsecured, negotiable and liquid instrument.
- Issued after obtaining approval from NRB.
- Highly credit rating firm can issue commercial paper.
- Effective interest rate or yield of commercial paper can be computed as follows:-

$$\text{Effective annual yield} = \frac{FV - \text{Issue price}}{I.P} \times \frac{360}{\text{Maturity period}}$$

Q no 26 Soln:-

$$\text{Effective rate of return (Yield)} = \frac{10,00,000 - 961,000}{961,000} \times \frac{12M}{6M} \times 100 = 8.12\%$$

$$1. \text{ Annual interest Rate} = \frac{FV - IP}{IP} \times \frac{360}{90}$$

$$\text{Or, } 0.1125 = \frac{5cr - X}{X} \times 4$$

$$\text{Or, } 0.1125M = 20cr - 4M$$

$$\therefore M = 4.8652219 \text{ cr.}$$

Cash Budget

It is the statement of estimated cash receipts, cash payment (whether capital or revenue items) and resulting cash balance over a given budget period.

It is a tool for planning and controlling the receipts and payment of cash to ensure the availability of cash when it is needed.

Format of cash balance

Particulars	RS
(a) Opening cash balance	xxx
(b) Cash receipts	
(i) Cash sale	xx
(ii) Collection from debtor	xx
(iii) Interest/dividend received	xx
(iv) Other receipts	xx
(c) Cash payment	
(i) Payment to creditor of raw material	xx
(ii) Payment of wages; overheads	xx
(iii) Repayment of loan	xx
(iv) Other payments	xx
(d) Closing cash balance	xxx

Q1028 Cash budget of ABC Ltd for (Quarterwise)

sol:-

→ Interest मात्रा आगदी तिरदा तिरदाव

Quarter	I	II	III	IV
Particulars:-				
(a) Opening cash balance	10,000	15,000	15,000	15,000
(b) Cash received				
(i) Collection from debtors	1,25,000	1,50,000	1,60,000	2,21,000
(c) Cash Payment				
(i) Material purchase	(20,000)	35,000	35,000	54,200
(ii) Other expenses	(25,000)	20,000	20,000	17,000
(iii) Salary & wages	(90,000)	95,000	95,000	10,9,200
(iv) Income tax	(5,000)			
(v) Purchase of machine	-	-	-	20,000
(d) Closing balance before adjustment of loan	(5,000)	15,000	25,000	35,695
(e) Loan taken	20,000			
(f) Loan repayment including interest	-	-	9,75*	11,288
(g) Closing cash balance	15,000	15,000	19,25	24,337

WN-1*

$$\text{Interest} = 9500 \times 10\% \times \frac{6}{12} \Rightarrow ?$$

$$= 475 + 9500 \rightarrow \text{Principle}$$

Interest is calculated on repayment principal for 2 quarters as the loan is taken at the end of 1st quarter

$$\therefore \text{Principal payment} = 10500$$

Int on Repaid principal

$$10500 \times 10\% \times \frac{3}{4} = 787.5$$

$$10500 + 787.5 = 11287.5$$

→ i.e 3rd quarter.

Q no 9 Cash Budget

	June	July	Aug	sep
(a) Opening balance	45000	45500	45800	45000
(b) Cash received				
(i) Cash sales	1,00,000	98,000	1,08,000	1,22,000
(ii) Collect from debtors	3,48,000 (429,000 + 450,000 x 0.8) x 0.5	3,80,000	3,96,000	4,20,000
(iii) Dividend received	25000	-	-	-
(c) Cash payment				
(Material) Credit allowed by supplier	2,00,000 (1,69,000 + 16,500)	2,10,000	2,69,000	2,82,000
Payment of Wages	1,62,500	1,65,000	1,65,000	1,67,500
• Payment of Overhead	40,000	39,000	37,500	60,800
" of Interest	30,000	-	-	-
Payment of installment (machinery)	-	20,000	20,000	20,000
Income tax	-	-	15,000	-
Surplus Deficit	85,500	90,500	52,800	48,700
Cash balance	40,000	45,000	7,000	30,000
	45,500	45,500	46,800	45,700

Assumption - Minimum cash balance is kept at Rs 45,000.

$\frac{40,000}{1000} = 4$ but $\frac{45,500}{1000} = 45.5$ hence
 $\frac{45,000}{1000} = 45$

Working Capital Management

Date: / /

(1) Working capital (Circulating capital)/Revolving capital
 Working capital means excess of current assets over current liabilities. It refers to management of short term assets and short term liability. The objective of working capital management is to ensure that the firm is able to continue its operation without any interruption and that it has sufficient fund to satisfy to satisfy the current obligation.

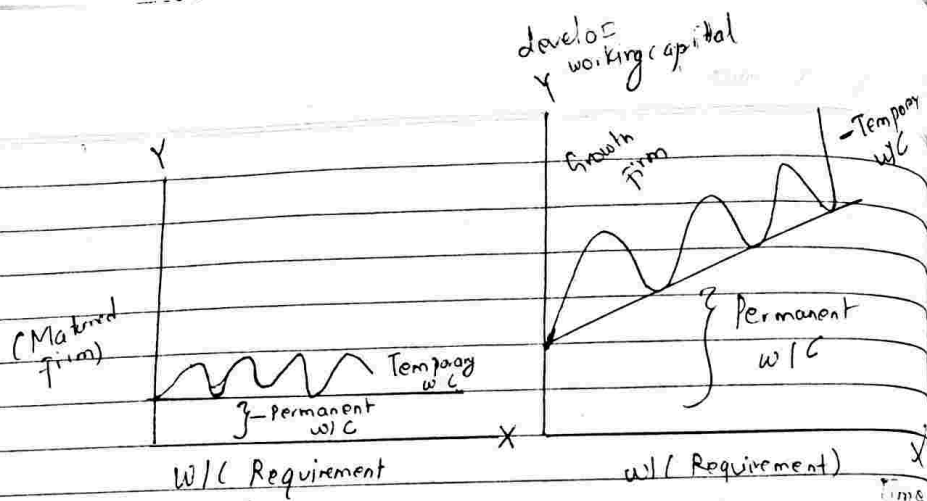
(2) Classification of working capital based on value

- (a) Based on value or concept
- (i) Gross working capital \Rightarrow Current assets only
 - (ii) Net working capital \Rightarrow CA - CL

(b) Based on time

- (i) Permanent / Hard-core working capital (निर्धारित धन - Permanent)
 It is the minimum level of working capital required in the business at all points of time. It is kept irrespective of demand and supply.

- (ii) Seasonal wala
 Temporary working capital / Fluctuating working capital
 It is over and above permanent W/C.
 - also called variable or fluctuating working capital
 - It is maintained as per business need (more stock is needed in case of high season of sales)



③ Adequacy of working capital

Working capital should be optimum (neither too much nor too low)

Huge working capital means firm is having ideal funds and low working capital means firm is running with the risk of short term insolvency.

Working capital may be considered optimum when current assets is more than current liability.

(i) $CA > CL$

(ii) Current Ratio (CR) = 2:1 [Differs with industry to industry]

(iii) $QR = 1:1$

Importance of working capital

- Working capital is the life blood and nerve centre of the business.
- It is a measure of firm's efficiency and short term financial health.
- It is a base to create goodwill of the firm and a base for obtaining short term finance.
- It ensures uninterrupted production and operation of a business.
- Ability to face crisis in emergency

- Easy to meet day to day expenses like salaries, wages etc. which increases employee's performance & productivity.

Estimation of working capital needs

By estimating operating cycle period

By estimating component of current assets & current liability Individually



Step-1 Determine operating year period.

Step-2: Compute number of operating cycle in a year.

Step-3:- $\frac{360}{12/52}$

O. Cycle period

Step 3:- Working capital requirement = $\frac{\text{Annual operating expenses from cost sheet}}{\text{Number of operating cycle in a year.}}$

+ Desired cash balance.

By estimating component of CA & CL individually

Step 1:- Estimate each item of current assets and current liability as per given information

Compute networking capital as under

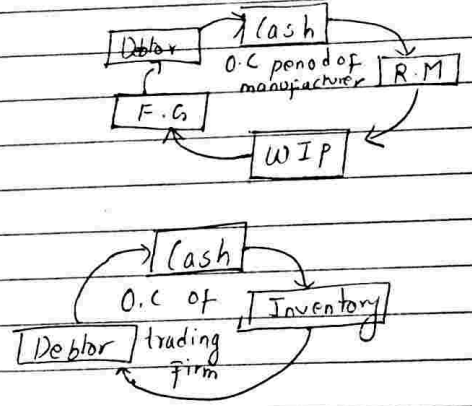
Net working capital = Current assets - Current liability

④ Operating cycle
 It is a time within which the cash invested in working capital is realized back. (i.e. time for rotation of funds)

- It involves the following cycle of events.
- Conversion of cash into raw material
 - Conversion of raw material to WIP.
 - Conversion of WIP to finished goods.
 - Conversion finished goods to debtors.
 - Conversion of debtor into cash.

Requirement of working capital depends on period of operating cycle. Faster the funds rotate, lower will be the requirement of working capital and vice-versa.

Representation of working capital cycle / operating cycle



Computation of operating cycle period (R)
 $O.C.P = \text{Raw material storage period} + \text{WIP conversion period} + \text{F.G. Holding period} + \text{Debtors collection period} - \text{creditors payment period}$

① Raw material holding period (R) / R.M. velocity year
 $= \frac{\text{Average Stock of Raw material} \times 360}{\text{Raw material consumption per day}}$
 OR
 $\frac{360}{\text{Raw material turnover ratio}}$

② WIP conversion period
 $= \frac{\text{Avg stock of WIP} \times 360}{\text{Cost of production / day}}$
 $= \frac{360}{\text{WIP turnover ratio}}$

③ Finished goods holding period
 $= \frac{\text{Avg stock of finished goods} \times 360}{\text{OGS per day}}$
 OR = 360

④ Debtors collection period / Debtors turnover ratio
 $= \frac{\text{Finished goods T/O ratio} \times \text{Avg debtors} \times 360}{\text{Credit sales / day}}$
 OR
 $\frac{360}{\text{Debtors turnover ratio}}$

⑤ Creditors payment period = Creditors turnover ratio
 $= \frac{\text{Avg creditors} \times 360}{\text{Credit purchase / per}}$
 OR
 $\frac{360}{\text{Creditors turnover ratio}}$

Q no 3

$$(i) \text{ Raw material storage period (R)} = \frac{\text{Avg stock of raw material}}{\text{Avg raw material per day}}$$

$$= \frac{200}{10} = 20 \text{ days.}$$

$$(ii) \text{ Duration of WIP stage (W)} = \frac{\text{Avg WIP stock of raw mat}}{\text{Avg WIP value}}$$

$$= \frac{300}{12.5} = 24 \text{ days.}$$

$$(iii) \text{ Duration of finished goods (F)} = \frac{180}{18} = 10 \text{ days.}$$

$$(iv) \text{ Duration of acq' payable} = \frac{300}{20} = 15 \text{ days.}$$

$$(v) \text{ Account payable} = \frac{180}{180} = 18 = 18 \text{ days.}$$

Q no 4

$$R = \frac{50,000}{\frac{600,000}{360}} = \frac{50,000}{1666.67} = 30 \text{ days.}$$

$$W = \frac{30,000}{\frac{50,000}{360}} = \frac{30,000}{138.88} = 21.6 \text{ days}$$

$$(F) = \frac{40,000}{\frac{800,000}{360}} = \frac{40,000}{2222.22} = 18 \text{ days}$$

$$(D) = 45 \text{ days.}$$

जो फ्री $\frac{\text{No of Frequency/cycle}}{\text{Cost}} \rightarrow$ माते 360 cycle/year

$$= 30$$

$$OC = 30 + 21.6 + 18 + 45 - 30 = 85 \text{ days.}$$

$$\text{No of OC} = \frac{360}{85} = 4.2\#$$

Q no 6 Soln:-

(1) Computation of OC period:-

$$(1) \text{ Raw material storage period (R)} = \frac{\text{Avg stock of raw material}}{\text{Consumption of RM per day}}$$

$$= \frac{10,80,000}{\frac{180,000 + 2,00,000}{2}} = \frac{10,80,000}{360} = \frac{190,000}{3000} = 63.33 \text{ days.}$$

$$\text{WN:- Raw consumption O/R} = 1,80,000$$

$$+ \text{Conjunction} = 11,00,000$$

$$- \text{C.S} = 2,00,000$$

$$\text{Consumption of Raw Material } 10,80,000$$

$$(2) (W) = \frac{\text{Avg WIP stock}}{\text{Avg cost of prodⁿ / day}}$$

$$= \frac{80,000}{\frac{60,000 + 1,00,000}{2}} = 18.7 \text{ days}$$

$$= 18.7 \text{ days}$$

WN \rightarrow Avg Cost of prodⁿ:-

$$\text{RM consumption } 10,80,000$$

\rightarrow Ye paradi Cost sheet bata aacha i.e.

$$\frac{15,80,000}{360} = 4388.89$$

Note:- Admⁿ expenses is not included in valuation of stock.

Cost Sheet

(iii) FG holds period = Avg FG stock
 Daily COGS = 2,80,000
 = $1 - 4166 \cdot 67$
 = 67.2 days

Op Raw material = 1,80,000
 + Purchase = 11,00,000
 - CIS = 2,00,000
 Raw material = 10,80,000
 + wages = 3,00,000
 + Prodⁿ OH = 2,00,000

(iv) D = $\frac{175,000}{5555.56}$
 = 31.5 days

Gross Factory cost = 15,80,000
 + Openg WIP = 60,000
 - Clos^d WIP = 1,00,000
 Net Factory cost = 15,40,000

(v) Credit. Paym^t period = $\frac{2,20,000}{11,00,000/360}$
 = 3055.56 = 72 days

+ Openg FG = 2,60,000
 (-) Clos^d FG = 3,00,000
 COGS = 15,00,000
 + Admⁿ & sell^g and distⁿ = 2,50,000
 Cost of sales = 17,50,000

Openg cycle period = 63.33 + 18.7 + 67.2 + 31.5 - 72 = 108.73 days

+ Profit = 2,50,000
 Sales (B.F) = 20,00,000

No of O.C in year = $\frac{360}{108.73} = 3.31$

WG requirement

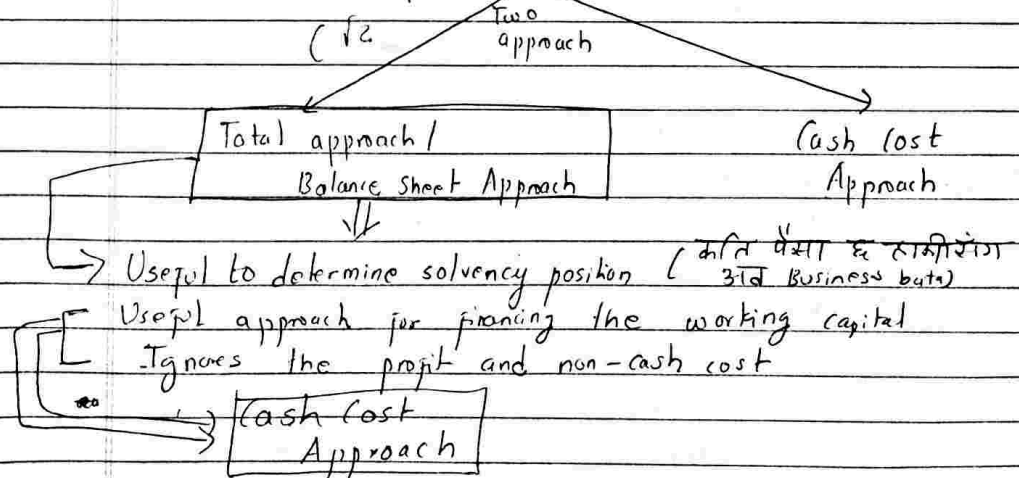
= Total expenses P.A = 17,50,000
 No of O.C per year = 3.31
 = 5,28,701

Q no 5 solⁿ:-

Number of operating cycle = $\frac{360}{54} = 6.67$ days in a year

Working capital requirement = Annual cost of goods sold
 No of openg cycle in a year = 6.67
 = $\frac{136}{6.67} + 1.5$
 = 21.80 cr.

Estimation of working capital by estimating the component of current assets and current liabilities.



Computational steps

Step 1 Determine the items of current assets and current liabilities required to be estimated. (Question लेखी (566))

Step 2 Compute the holding period of each item

Step 3 Compute rate of valuation as follows:-

(i) Raw material is valued at purchase price net of discounts

$$\therefore \text{Raw material stock required} = \text{Raw material consumption per day} \times \text{Raw M holding period}$$

(ii) WIP is valued on the basis of cost incurred upto WIP stage of production (Assump 100% complete for material and 50% complete for conversion cost (labour and overhead)) in the lack of information (Factory Overhead $\frac{1}{2}$ आचा - Admⁿ आचा)

(iii) Stock of WIP-

$$(100\%) = \text{Raw material consumption per day} \times \text{WIP holding period} \times \text{Degree of completion}$$

$$(50\%) + \text{Conversion cost per day} \times \text{WIP holding period} \times \text{Degree of completion}$$

(iv) Stock of Finished good

Finished goods are valued on the basis of cost of goods sold.

$$\text{Stock of finished goods required} = \text{Cost of goods sold per day} \times \text{Finished goods holding period}$$

(v) Debtors are valued on sales value (if cost approach is followed) and cost of sales

excluding depⁿ (If cash cost approach is followed)
Debtors balance = $\frac{\text{Credit sales per day} \times \text{Avg collection period}}{\text{Cost of sales per day (excluding depⁿ)} \times \text{Avg collection period}}$

(vi) Creditors are valued at purchase cost net off discount

$$\text{Creditors Balance} = \text{Credit purchase per day} \times \text{Creditors holding period}$$

Creditors for expenses are valued on cost basis.
Creditors for expenses = $\frac{\text{Cost of expense per day} \times \text{Days in payment}}{\text{Wages and overhead}}$

Step-4 Find working capital by considering other information

Note:- While calculating working capital of existing business (कृतनी) Opening balance of working capital component is assumed to be equal to closing balance. However in case of new organization, opening balance is always equal to zero.

Qno 13 Soln:-
 Statement showing requirement of WG:-

Particulars	Total Approach	Cash cost approach
(a) Current assets		
(i) Stock of raw material $(\frac{1040000}{52} \times 4)$	8,00,000	8,00,000
(ii) Stock of WIP lost of raw material $(\frac{1040000}{52} \times 2) \times 100\%$ $= 4,00,000$		4,00,000
labour & overhead $(\frac{41,60,000 + 8,20,000}{52} \times 2)$ $= 124,80,000 \times 2 \times 50\%$ $= 24,96,000$	640,000	124,80,000 - 120,000 $= 104,00,000 \times 2 \times 50\%$ $= 20,80,000$ $= 6,00,000$ $= 16,00,000$
(iii) F-G Stock $\frac{2880000}{52} \times 4$	17,60,000	16,00,000
(iv) Debtor $(\frac{24,96,000}{52} \times 8)$ $(\frac{20,80,000}{52} \times 8)$	3840,000	3200,000 $+ 500,000$ $= 3,700,000$
(v) Cash / Bank	7,06,50,000	62,25,00,000
WN-1 Total (A) lost - sheet		
Raw material consumption $(104,000 \times 100)$	104,00,000	
Direct wage $(40 \times 104,000)$	41,60,000	
Overheads $(\text{cash cost} = \frac{41,60,000 + 8,20,000}{52} \times 2)$	83,20,000	
FC / cost of prod / cost of sales	2,28,80,000	
(+) Profit (B.F)	20,80,000	
Sales $1200 \times 104,000$	24,96,00,000	

Total unit $\frac{104000}{52} = 2000$ unit a week

now
 Raw material $\leftarrow 2000 \times 4 \times 100 =$
 $2000 \times 2 \times 100$
 $\leftarrow 2000 \times 2 \times 120 \times 50\%$
 $\leftarrow 2000 \times 2 \times 100 \times 50\%$

Gyana

Jyoti

Particulars	Total Approach	Cash cost Approach
(A) Current Assets	7,06,50,000	62,25,00,000
(B) Current liability Creditors for RM $(\frac{10400000}{52} \times 4)$	8,00,000	8,00,000
(ii) (i) S. wages $(\frac{41,60,000}{52} \times 15)$	1,20,000	1,20,000
Total current liability (B)	9,20,000	9,20,000
(C) WC = (A - B)	61,45,000	53,05,000

Qno 9 Statement showing requirement of Current Assets and gross WC.

Particulars	Total Approach	Cash cost Approach
(a) Stock of R.M (5000×100)	5,00,000	
(b) WIP Stock $(2500 \times 1 \times 100)$	2,50,000	
(c) Manufacturing expes. $(2500 \times 1 \times 30) \times 50\%$ $3 = 500$	37,500	14,50,000 $+ 0.05m = m$ $m = 1526316$
(iii) F-G $(2500 \times \frac{1}{2} \times 130)$	1,62,500	
(iv) Debtors (Total basis) $(2500 \times 1 \times 200)$	5,00,000	
(v) Cash balance	0.05m	7,63,16
Gross Working capital		m 1526316

$$20,16,000 + \left[\frac{144,000 \times 4}{52} \right] \times 50 + \begin{matrix} 64,800 \\ 2,88,000 \\ 5,76,000 \\ \hline = 15,12,000 \end{matrix}$$

Qno 10 Estimation of Working Capital Requirement (Cash approach)

(A) Current Assets:-

Inventory of Raw Materials $\left[\frac{64,800 \times 2 \times 1}{12} \right]$ 10,80,000

Inventory of WIP $\left[\frac{144,000 \times 4}{52} \times 50 \right]$ 11,63,67.69

Inventory of Finished goods $\left[\frac{15,12,000 \times 1}{12} \right]$ 5,81,538

Debtors $\left[\frac{144,000 \times 105 \times 80\%}{12} \right]$ 2,91,600

Bank

29,21,538

(B) Current liabilities

Creditors for purchase $\left[\frac{144,000 \times 45}{12} \right]$ 5,40,000

O/S wages & O/S OH $\left[\frac{144,000 \times 60 \times 1.5}{52} \right]$ 2,49,231

Total (B)

Net Working Capital (A-B) 42,48,307

Qno 11 Statement showing estimation of working capital (cash-cost)

(A) Current Assets

Inventory of raw material $\left[\frac{78,000}{52} \times 117 \times 4 \right]$ 7,02,000

Inventory of WIP

Material $\left[\frac{15,000 \times 2 \times 117}{52} \times 80\% \right]$ 5,13,000

Labour $\left[\frac{15,000 \times 2 \times 49}{52} \times 60\% \right]$ 8,82,000

Overhead $\left[\frac{15,000 \times 2 \times 80}{52} \times 60\% \right]$ 1,44,000

Inventory of finished goods $\left[\frac{15,000 \times 2 \times 46}{52} \times 3 \right]$ 1,07,000

Bad Debts $\left[\frac{15,000 \times (264-18)}{52} \times 6 \right]$ 1,77,120

Total (A) Bank 2,50,000

47,86,000

43,43,201

KT) Dep'n ma सर्व (Actual पैसा) जादेन + Profit vaneko memo goods ko cost haina tesailo exclude huncha yo sab.

(B) Current liabilities

Creditors $\left[\frac{15,000 \times 117}{52} \times 8 \right]$ 14,04,000

O/S Wages $\left[\frac{15,000 \times 49}{52} \times 1 \right]$ 73,500

O/S OH $\left[\frac{15,000 \times 80}{52} \times 2 \right]$ 2,40,000

Total (A-B)

30,68,500 26,25,701

Qno 12 Computation of Working Capital Requirement (cash cost approach)

(A) Current Assets

Inventory of RM $\left[\frac{25,000 \times 100}{52} \times 100 \right]$ 10,90,000

Inventory in WIP

Raw material $\left[\frac{25,000 \times 100}{52} \times 1 \times 80\% \right]$ 75,000

Labour $\left[\frac{25,000 \times 37.5}{52} \times 1 \times 80\% \right]$ 4,25,000

OH $\left[\frac{25,000 \times 75}{52} \times 1 \times 80\% \right]$ 1,50,000

Inventory of Finished goods

$\left[\frac{25,000 \times 2 \times 212.5}{52} \right]$ 10,62,500

Debtors $\left[\frac{25,000 \times 4 \times 212.5}{52} \right]$ 2,12,500

Bank

37,500 46,50,000

(B) Current liabilities

Creditors $\left[\frac{25,000 \times 100}{52} \times 3 \right]$ 7,50,000

Lag in payment of wages $\left[\frac{2 \times 25,000 \times 37.5}{52} \right]$ 93,750

Lag in payment of OH $\left[\frac{2 \times 25,000 \times 75}{52} \right]$ 3,87,500

A - B

12,18,750

34,31,250

Note: (Dep'n can never be O/S irrespective of the methods followed.)

RM + DW + PC + NE → Ex + Dep

Cash cost of goods sold ra Cash cost of sales

Qno 14 Stat showing requirement of Working capital for the year ended 31.12.1996. (Cash)

Particulars	Amount
(A) Current Assets	
(i) Stock of Raw material $(675,000 \times \frac{1}{12})$	56250
(ii) Stock of FG $(1935,000 \times \frac{1}{12})$	161250
(iii) Debtors $(2205000 \times \frac{1}{12})$	367500
(iv) Repaid sales expenses $(90,000 \times \frac{3}{12})$	22500
(v) Cash balance	116250
	<u>723750</u>
(B) Current Liabilities	
Creditors for material $(675,000 \times \frac{2}{12})$	112500
O/S wages $(540,000 \times \frac{1}{12})$	45000
Manufact expn expn	60,000
O/S admn expn $(18000 \times \frac{1}{12})$	15000
Total C.L	<u>2,34,500</u>
(1) Working note Working capital (A-B)	491,250
(ii) CGS = Sales - Gross profit	73688
	<u>564438</u>
	$= 27,00,000 - 0.2 \times 27,00,000$
	$= 21,60,000$

As per question 21,60,000 includes depⁿ also,
 (ii) Calculation of depⁿ

$= \text{Total CGS} - \text{Manufacturing cost other than dep}^n$

$= 21,60,000 - \text{Raw material consumption} - \text{wages incurred} - \text{manufacturing expenses other than dep}^n$

$= 21,60,000 - 675,000 - 540,000 - 720,000$

$= 19,35,000$

Cost of goods sold = Total CGS - Goods sold in Dep

$= 21,60,000 - 2,25,000$

$= 19,35,000$

question no clearly state that for Manufac expenses matra o/s at the end of the year
 ⇒ navaye arw sab yearly at () → bracket matra

cash cost of goods sold = 1935000

+ Admⁿ expenses = 180000

+ Sales promotion exp = 90,000

cash cost of sales 2205000

(Closing sales)

Cash balance

$232,500 \times 0.5 = 116250$

Qno 15 Statement of working capital requirement

Particulars	Amount
(i) Raw material stock $(9,00,000 \times \frac{1}{12})$	75,000
(ii) Finishe goods $(27,00,000 \times \frac{1}{12})$	225,000
(iv) Debtors	
Domestic $(20,50,000 \times \frac{1}{12})$	= 171667
Export $(10,30,000 \times \frac{3}{12})$	= 2,57,500
(iv) Sales promotion $(1,50,000 \times \frac{1}{4})$	37500
(v) Cash balance $(250,000 - 75000)$	175,000
Total (A)	<u>941667</u>

(B) Current liability

Creditors for material $(9100,000 \times \frac{2}{12})$	150000
due in payment of wages $(720,000 \times \frac{1}{2} \times \frac{2}{12})$	30,000
O/S manufact exp	90,000
O/S admn exp	20,000
Income tax payable $(235,000 \times \frac{1}{4})$	58750
Total (B)	<u>346250</u>

(C) $(A - B)$ → 595417

(D) Safe Margin @ 12% → 71500

Total → 666867

Cost sheet

RM consumption	9,00,000
(+) Wages	7,20,000
(+) Manufacturing exps	10,80,000
Factory cost	27,00,000
(+) Adm exps	2,40,000
(+) Sales promotion exps	1,50,000
Cash cost of sales	30,90,000

Working note 2

Apportionment of cost of sales into domestic and export sales

$$\text{Domestic} = 30,90,000 \times \frac{24,00,000}{36,00,000} = 20,60,000$$

(12+24 lakhs)

WN:

Foreign export sales equivalent to domestic sales

$$\frac{10,80,000}{0.9} = 12,00,000$$

$$\text{Total sales for apportioning cost of sales} = 24,00,000 + 12,00,000 = 36,00,000$$

$$\text{Export} = 30,90,000 \times \frac{12,00,000}{36,00,000} = 10,30,000$$

Date: / /

Particulars	Cost	Total Approach
(A) Current assets		
- Raw material stock	30,000	30,000
	$[60,000 \times 5 \times 60\% \times \frac{2}{12}]$	
- Finished goods stock	67,500	67,500
	$[60,000 \times 5 \times 90\% \times \frac{3}{12}]$	
- Debtors	67,500	75,000
	$[60,000 \times 5 \times 90\% \times \frac{3}{12}]$	$[60,000 \times 5 \times \frac{3}{12}]$
- WIP stock	18,750	18,750
	$[60,000 \times 5 \times 60\% \times \frac{1}{12}]$	
	+ 15,000	18,750
	$[60,000 \times 5 \times 30\% \times \frac{1}{12} \times 50\%]$	20,000
- Cash balance	20,000	2,12,250
	2,03,750	

(B) Current liabilities		
- Creditors	30,000	30,000
	$[60,000 \times 5 \times 60\% \times \frac{2}{12}]$	
- O/S wages and OH	75,000	75,000
	$[60,000 \times 5 \times 30\% \times \frac{1}{12}]$	
	37,500	1,12,500
(C) WC (A-B)	1,66,250	1,73,750

same

(D) Particular		Cash-cost approach
(1) Current Assets		
- Raw material stock		10,80,000
		$[54,000 \times 200 \times 60\% \times \frac{2}{12}]$
- WIP stock		6,75,000
		6,75,000
	Material	$[54,000 \times 220 \times 60\% \times \frac{1}{12}]$
		+ 17,82,000
		$[54,000 \times 220 \times 50\% \times 50\%]$

Stock valuation ma admⁿ expenses rakhdainno.

Debtor $\left[\frac{54,000 \times 90\% \times 1.5 \times 200}{12} \right]$

=

Finished goods $\left[\frac{54,000 \times 200 \times 90\% \times 1}{12} \right]$

=

Cash price $2,16,000$ ($5,40,000 \times 40\%$)

8) Current liabilities
Creditor

$\left[\frac{54,000 \times 200 \times 60\% \times 1}{12} \right]$

= 540,000

540,000

Safety marg (A-13)

Safety margin @ 15%
WC required:-

Thukking point

17) Year - 2 क closing stock क valuation + FIFO
mai से है।

Total approach
Debtors in cash cost

$$\frac{240,000}{12} \times 2.25 = 45,000$$

$$\frac{5,22,000 - 1,20,000}{12} = \frac{4,02,000}{12} = 33,500$$

$$+ \frac{48,000}{12} = 4,000$$

$$\frac{440,000}{12} = 36,667$$

Q no 17 (1) Projected income statement:-

	Year-I	Year-II
Opening stock of Raw Material	0	45,000
(+) Purchase of Raw Material	2,85,000 (BF ₁)	3,82,500 (BF ₂)
(-) Closing stock of Raw Material	45,000	67,500 ($\frac{36,000}{12} \times 2.25$)
Raw Material consumption	240,000	360,000 ($40,000 \times 40$)
(+) Labour charges + Variable Expenses	1,20,000 ($6,000 \times 20$)	1,80,000 ($9,000 \times 20$)
(+) Fixed factory OH (2000 x 6)	7,200	7,200
(+) Dep ⁿ (factory) (12000 x 10)	1,20,000	1,20,000
Factory cost (For 6000 units)	5,22,000	7,32,000
(+) Opening stock of finished goods	0	9,200
(-) Closing stock of FG	9,200	1,22,000 ($\frac{5,22,000}{6,000} \times 14,000 - 50,000$)
Cost of goods sold	4,60,000	7,02,000
(+) Fixed Adm ⁿ expenses	48,000 ($12,000 \times 4$)	48,000
(+) Selling overhead		
Fixed OH ($5 \times 20\%$)	120,000	1,20,000
Variable OH ($4 \times 12,000$)	20,000	34,000
Variable OH (1.85×4)	7,200	15,200
Cost of sales	5,14,000	7,96,000
(+) Profit (3F)	60,000	20,000
Sales	4,80,000 ($96 \times 5,000$)	8,16,000 ($96 \times 85,000$)

Note no 1

- Finished goods are valued on factory cost of production without considering administrative expenses.

(Closing stock Year (II) (9000 - 8500) = 500

Price = $\frac{1000}{1500} \times 16,000 = 10,667$

By using

Avg

cost

show

Finished goods are valued by using FIFO method.

As if $\frac{7,32,000}{9,000} \times 15,000 = 1,22,000$

- Variable OH are calculated on the basis of sales unit

Stock = on the basis of weeks
 Raw material $\frac{1}{4}$ avg ma 4 week consumption and 4 week equivalent to 1 month

Cost Sheet

Opening stock of Raw material	0
(+) Purchase of RM (Bf)	42,21,538
(-) Closing RM	30,15,38 $(39,10,000 \times \frac{4}{52})$
Consumption of RM $(\frac{96,000 \times 40}{80,000})$	39,20,000
(+) Direct Wages $(\frac{96,000 \times 15}{30,000})$	14,70,000
(+) Factory Overhead $(\frac{96,000 \times 30}{60,000})$	29,40,000
Gross FACTORY COST	83,30,000
(+) Opening WIP	0
(-) Closing WIP $(140,000 \times 85 \times 50)$	1,70,000
Net FACTORY COST	81,60,000
(+) Op stock of FG	0
(-) Closing stock of FG $(\frac{96,000 \times 12}{80,000 \text{ unit}})$	6,80,000 $(\frac{81,60,000 \times 8,000}{96,000})$
Cost of Goods Sold	74,80,000
(:) Profit $(88,000 \times 15)$	13,29,000
Sales $[88,000 \times 100]$	8,81,00,000

Statement of Working capital requirement

Particulars	Amount
(A) Current Assets.	
(i) Stock of raw material	30,15,38
(ii) Stock of WIP	1,70,000
(iii) Stock of FG	6,80,000
(iii) Debts $(\frac{88,000,000}{52} \times 8)$	13,53,846
(iv) Cash	50,000
Total (A)	25,55,384
(B) Current liability	42,21,538
(i) Creditors $(\frac{30,15,380 \times 4}{52})$	3,24,734
(ii) O/S wages $(\frac{14,70,000 \times 1.5}{52})$	1,24,040

(iii) O/S overhead $(\frac{29,40,000 \times 4}{52})$	2,26,154
Working Capital (A-B)	59,32,92
	19,62,992

Note:- Cost sheet is prepared on the basis of 12 months production of goods of 96,000 units and working capital is estimated on the basis of 52 weeks production of 96,000 units.

Note:- Impact of double shift working on W/C requirement
 When there is increase in demand, the same production process can be used for two shifts in place of single shifts.
 In such a case the working capital requirement also increases. However increase in working capital may not be directly proportional.

The impact of double shift working on various component of working capital can be explained as follows:-

- Stock of raw material.
 Raw material stock will be doubled because its usage per day will be twice as earlier. However due to bulk purchase the firm may avail quantity discounts. Hence average cost per unit of raw material may be reduced.
- Stock of WIP
 There will be no change in the quantity of WIP because work started in first shift will be completed in the second shift and at the end. The average units

of WIP will remain same.

③ Stock of finished goods
Due to large prodⁿ units finished goods stock may double in quantity. But cost of production may be reduced due to lower cost of raw material, economy in fixed cost etc.

④ Debtors Balance
Increased sales will lead to higher debtor but increase may not be directly proportional if credit period is changed.

⑤ Creditor's Balance
Due to bulk purchase and higher bargaining power, the firm may avail extended credit period for payment. Therefore creditors may not be doubled.

Note: In exam unless full information is provided all working capital components except WIP will be considered double.

Qno 56 The question can be solved by using two approaches:-

- ① To assess the impact of double shift for long term as a matter of production policy, or
- ② To assess the impact of double shift to mitigate the immediate demand for next year only.

The first approach is more appropriate and fulfilling the requirement of the question.

Solution:-

$$\text{Current sales} = 4,32,000$$

$$\text{S.P per unit} = 18$$

$$\text{Unit sold} = \frac{4,32,000}{18} = 24,000$$

∴ Prodⁿ & sales unit in double shift

$$= 24000 \times 2$$

$$= 48000 \text{ units}$$

② Cost sheet

	Single Shift (24000)		Double Shift (48000)	
	Per unit	Total	Per unit	Total
Raw material consumption	6	1,44,000	5.84	2,59,200
Wages				
Fixed	2	48,000	1	48,000
Variable	3	72,000	3	1,44,000
PRIME COST	11	2,64,000	9.4	4,51,200
(+) Tachy OH				
Fixed	4	96,000	2	96,000
Variable	1	24,000	1	48,000
FACTORY COST	15	3,84,000	12.4	5,95,200
(+) Total cost				
(+) Profit	2	48,000	5.6	2,68,800
Sales	18	4,32,000	18	8,64,000

Fixed cost ta uhi huncha ta double lein paisa ma hami banairachhu same no per unit so per unit half jo.

Qno 56 WC Requirement as a matter of prodⁿ policy (Total Approach)

	Single Shift	Double Shift
(A) Current Assets		
(i) Stock of raw material (6000x16; 12000x5.4)	36,000	64,800
(ii) Stock of WIP (2000x11; 2000x9.4)	22,000	18,800
(iii) Finished goods stock (4500x16; 9000x12.4)	72,000	1,11,600
(iv) Debtors (6000x18; 12000x18)	1,08,000	2,16,000
(v) Cash cost (16000x16; 18000x12.4)	96,000	1,48,800

∴ Debtors can cost

	Single	Double
Total (A)	238,000	3,94,280 411,200
(B) Current liability		
(i) Creditors for RM	24,000 $(\frac{144,000}{12} \times 2)$	43,200 $(\frac{2,59,200}{12} \times 2)$
(ii) Cr for exp (WN-3)	10,000	14,000
Net Total (B)	34,000	57,200
Net W/C requirement (A-B)	204,000	3,54,000

Working note (1)
Stock of RM

(i) Existing
 $\frac{36,000}{6} = 6000$ units.

(ii) % Stock of RM in double shift = $6000 \times 2 = 12,000$ units.

(2) Unit of WIP

Existing = $\frac{22,000}{11} = 2000$ units

Double shift = 2000 units (No change in WIP)

(3) Creditors for expenses

$\frac{[248,000 + 72,000 + 96,000 + 24,000]}{12} \times 0.5 = 10,000$

Creditor for expen

$\frac{[48,000 + 144,000 + 96,000 + 48,000]}{12} \times 0.5 = 14,000$

Date / /

Working capital investment policy (कति राशने W/C)

Three types of working capital investment policies are:-
Risk रंग आउने

(1) Conservative / Relaxed investment policy (मोति बरबाद होना कि मोर आउने)

The firm holds large amount of current assets. Due to large current assets, working capital will be high but expected profit will be low.
- It leads to high current ratio. Hence risk and return both will be low. (सरकारि जागिर बरने)

(2) Aggressive investment policy

- Lower current assets.
- Lower liquidity
- Current Ratio is lower.
- Risk & Return both will be high. (धेरै पैसा W/C मा लगाने)

(3) Moderate investment policy

- Balanced Policy.
- Moderate risk and return.
- Falls between the above two policies.

Working capital financial policy / financing requirement

Financing of W/C requirement (W/C को पैसा कति बने निरर आउने?)

The approached for financing W/C requirement are:-
(1) Conservative / Risk averse approach (दिने निरर पैसा)

Amount required for working capital is financed mostly from long term funds. It is less risky policy because only part of temporary working capital is financed from short term funds.

- Low risk low profit policy.

② Aggressive approach

- Amt required for working capital is financed mostly from short term funds.

- High risky policy because all the temporary W.C and part of permanent W.C is financed from short term fund.

- High risk, high profit policy.

③ Matching approach (Risk neutral policy)

- Also called hedging approach.

- Temporary working capital is financed from short term funds and fixed assets as well as permanent working capital is financed from long term funds

- Risk and return is balanced.

Diagrammatic Representation

Conservative		Aggressive		Matching	
Liability	Assets	Liab	Assets	Liab	Assets
	FA	Long term fund	FA	LTF	FA
Long term fund	Permanent WC		PWC		PWC
Short T.F	Temporary WC	Short term fund	T.WC	STF	TWC

Q no 1 Solution

① Working Capital Investment Policy	(Rs in crores)		
	Conservative	Moderate	Aggressive
(a) CA:-	4.50	3.90	2.60
loss:- CL	2.34	2.34	2.34
Net Working capital position	2.16	1.56	0.26
(c) Current ratio $\frac{CA}{CL}$	1.923 times	1.67 times	1.11 times
(b) $ROA = \frac{EBIT}{Total Assets}$	CA: 4.50	3.9	2.60
	FA: 2.60	2.60	2.60
(a) Total assets	7.10	6.50	5.20
(b) EBIT	1.23	1.15	1.000
ROA $\frac{b}{a}$	17.32%	17.69%	19.23%

② Working Capital Financing Policy

Here evaluation of working capital investment policy has been made and moderate investment policy is selected. Therefore, for each financing policy data relating to moderate working capital investment policy will be used.

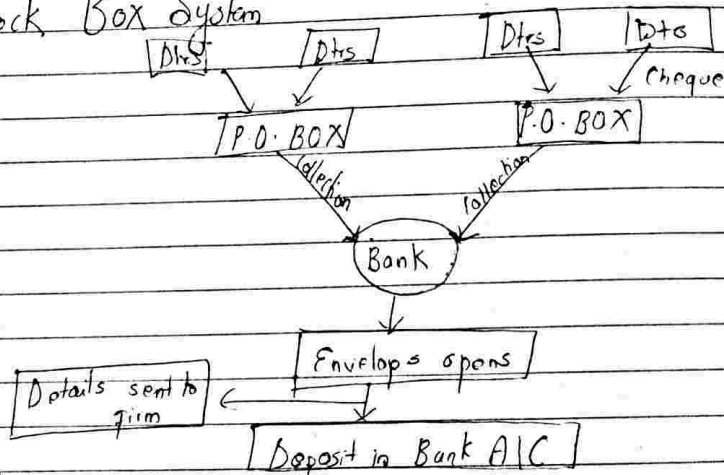
Financing Policy

	Conservative	Moderate	Aggressive
(a) CA $\frac{a}{a}$	3.90	3.90	3.90
(-) CL $\frac{b}{b}$			
- From WC policy:-	2.34	2.34	2.34
- From Financing	0.54 + 1.12	1.00	1.56
CL	2.88 (27.16%)	3.34	3.84
(a) WC Position	1.02	0.56	0.66
CR $(\frac{CA}{CL})$	1.354	1.68	1.016
(b) Return on shareholder's eqy E to ESH ESH Fund			

	1.15	1.15	1.15
EBIT	1.15	0.2256	0.2056
(-) Interest	0.244	0.6009	0.6139
EBT	0.5889		
EAT (EBT x 0.65)			
ROE = $\frac{0.5889}{2.5}$	23.56%	24.03%	24.586%

Methods of accelerating cash collection

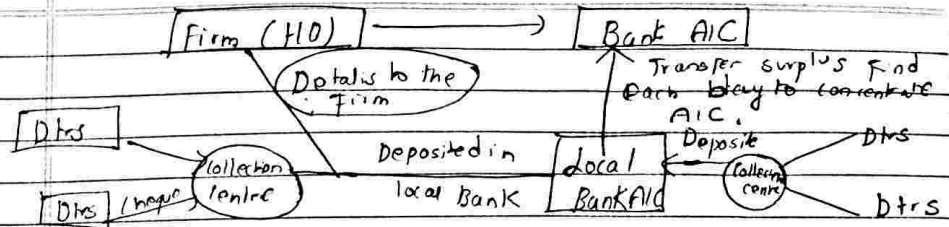
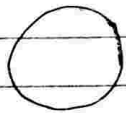
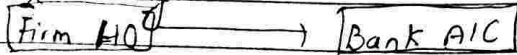
① Lock Box System



Process:-

- Customer send their cheques to P.O.Box (lock box) instead of sending it to the firm.
- A Bank, as an agent, collects cheque and deposit it in firm's Bank A/C and details are sent to the bank-firm.

② Concentration Banking



- Customer sent their cheques to collection centres instead of their office.
- Collection centres deposit cheques in local bank A/C of the firm and details are sent to the firm.
- Local bank deposits surplus fund to the main bank A/C.

Q no 58 (a) Reduction in cash balance

$$= \text{Total time saving} \times \text{Avg daily collection}$$

$$= 2.5 \times 500,000$$

$$= 17,50,000$$

(b) Opp cost of present system

$$= 17,50,000 \times 5\%$$

$$= 87500$$

(c) Yes

Since the opp cost of present system is Rs 87500 exceeding the cost of lock box system Rs 75,000, The system should be initiated.

question ma investment first ma profit bata lincha ani kanti vako external yesma 40 lakh cha dividend dya. 20 lakh → baaki tam chaine 25 20 lakh → baaki tam chaine 25 50 lakh chayo. (Amt In ~~lakh~~)

Qno 14 (11)

Year	1	2	3	4	5
NI	5000	4000	2500	2000	1500
Investment	2500	2500	3200	4000	5000

Dividend 25 lakh
10 lakh

⇒ 2.5 lakh Aba 40 lakh

50% maintain 50% DP ratio

50,00,000 kamayo
50% DP ratio i.e
2.5 lakh (50% x 5%)
10 lakh → Equity shareholders
2.5 lakh
Dividend badyo.

50 20 lakh - Distribute 50% 4.5 lakh ta investment chayo
50 lakh bahira 20 lakh chaye
50 15 lakh = 1.5 lakh
10 lakh Dividend

3rd year 25,00,000
so 12,50,000 → Dividend Pay 50% 12.5 lakh ta invest chayo.
32,00,000

Profit 25,00,000
12,50,000 → Badne
12,50,000 Baki
Ta chaine 32,00,000
19,50,000

Tara yesma ta investment vanda income kam chano dividend.

(25,00,000) Income
Investment 32,00,000 chayo.
7,00,000 chayo.

(1) 5,00,000 equity share @ 250 M.P.S.

DPS Rat
DP Ratio =

$$k_e = \frac{DPS}{MPS}$$

$$= \frac{250}{250}$$

$$= 20\%$$

$k_e = 10\%$ 10,000 of 100 each, Dividend per share
NI = 1,00,000 Investment = 2,00,000

NI = 1,00,000
50,000
Dividend = 10
1,00,000 - 100,000

(2) 1,00,000 - 0
= 1,00,000
2,00,000 - 1,00,000
= 1,00,000
P = $\frac{D_1 + P_1}{1 + k_e}$
= $\frac{250 + 110}{1 + 0.1}$
= 118

If dividend is paid.
 $1,00,000 - 10,000 \times 5$
= 50,000

Residue 50,000

2,00,000 - 50,000
= 1,50,000

1,00,000

Price per share (1)
 $P = \frac{D_1 + P_1}{1 + k_e}$

$100(P_0) = \frac{5 + 105}{1 + 0.1}$

$105 = \frac{110}{1.1}$ $P_1 = 105$

Value of the firm = $\frac{P_1(N_1 + N_2) + E_1 - I_1}{1 + k_e}$

Dividend

Date: / /

Qno 4 If treated as residual decision

	Profit	Inve. (a)	Balance (b)	DPS	10,000
1	50,00,000	25 lakh	25 lakh	2.5	
2	40,00,000	25 lakh	15 lakh	7.50	
3	25,00,000	32 "	-	0	
4	20,00,000	40 "	-	0	
5	15,00,000	50 "	-	0	

(ii) If DPS and external fin. req. at 50% p/yr

Dividend	DPS (%)	Invest	External Finance
$\frac{25}{10} = 2.5$	2.5	25 lakh	-
$\frac{20}{10} = 2$	2	25 lakh	5 lakh
1.25	32 lakh	19.5	
1.00	40 lakh	30	
0.75		42.5	

Qno 3

End of Year	Dividend	50% Chaise	External Fin. req.	PV factor	PV of Dividend
Year 1	40	20	20	0.84746	38.98
Year 2	40	20	20	0.71818	37.99
3	40	20	20	0.60863	37.03
4	40	20	20	0.515	34.52
5	40	20	20		30.00
6	40	20	20	0.37043	210.70

Year 7 dividend = $80.98 \times 1.05 = 85.03$

Market Value at end of Year 6 = $\frac{85.03}{0.18 - 0.05} = 654.08$

PV at end 6 = $0.37043 \times 654.08 = 242.29$
 Value of share = $210.70 + 242.29 = 452.99$

Sharawan 2062 shares. MP=300 Total price
 Purchase price 1000 100x300 30,000

Year	Dividend	Dividend	Dividend	Dividend	Dividend	Dividend
2062						
2063	10,000 x 10% = 1000					
2064	10,000 x 10% = 1000					950
2065	10,000 x 10% = 1000					950
2066	10,000 x 10% = 1000					950
2066	10,000 x 10% = 1000					950
On Ashad 2066						3800

$\frac{100}{5} \times 2 = 40$ shares

So Total number of shares = 140.

Now, Dividend
 2067 = $140 \times 100 = 14000 = 14000 \times 95\% = 13300$
 Total Dividend. 5130

In 2068 Sales. = $140 \times 450 = 63,000$

Capital gain = $63,000 - 30,000 = 33,000$

Capital gain after taxes = $33,000 \times 90\% = 29,700$

Total amt received = 59700

Present value of P's receipt, 330

= $950 \times PVIFA_{10\%, 7 \text{ years}} + 1000 \times PVIF_{10\%, 7 \text{ year}} + 59700 \times PVIF_{10\%, 6 \text{ m year}}$
 = 45403.36