LEVERAGE

INCOME STATEMENT	
Particulars	**Amount**
SALES	
LESS: VARIABLE COST (as a % of Sales)	
CONTRIBUTION	
LESS: FIXED COST	
EBIT	
LESS: INTEREST (Debenture X Interest Rate)	
EBT	
LESS: TAX (as a % of EBT)	
EAT	
LESS: PREFERENCE DIVIDEND (Pref share capital X Pref Dividend Rate)	
EAFESH	

OPERATING RISK

Measured by DOL.

Higher the DOL, higher the operating risk.

DOL = Contribution / EBIT

Interpretation - $\frac{\%\ \text{Change in EBIT}}{\%\ \text{Change in Sales}}$

FINANCIAL RISK

Measured by DFL.

Higher the DFL, higher the financial risk.

DFL = EBIT / EBT**

Interpretation - $\frac{\%\ \text{Change in EPS}}{\%\ \text{Change in EBIT}}$

**** IN CASE OF PREF SHARE, DFL =EBIT/(EBIT-INT-PREF DIV./1-T)**

COMBINED RISK

Measured by DCL.

Higher the DCL, higher the overall risk.

DCL = Contribution / EBT**

Interpretation - $\frac{\%\ \text{Change in EPS}}{\%\ \text{Change in Sales}}$

**** IN CASE OF PREF SHARE, DFL =EBIT/(EBIT-INT-PREF DIV./1-T)**

KEY POINTS

- **PV RATIO =CONTRIBUTION / SALES*100**
- **PV RATIO + VC % on sales=100%**
- **EPS=EAFESH / NO.OF EQUITY SHARES.**
- **ROE = EAFESH / EQUITY x 100**
- **ASSET TURNOVER RATIO= SALES /TOTAL ASSET**
- **DOL = 1 / MOS**

EXAM FOCUS –

1. In case of missing figure problem, if amount of interest is given, use DFL. If Fixed Cost is given, use DOL.

2. In case EAT is given, we can calculate EBT = EAT / (1-t)

DFL – AS DOUBLE EDGED SWORD / TRADING ON EQUITY

DFL indicates the use of funds with fixed cost like long term debts & Pref. Share capital along with equity share capital which is known as trading on equity.

Effect on EPS & ROE:-

When ,ROI > INT.- FAVOURABLE- ADVANTAGE

When ,ROI < INT.- UNFAVOURABLE- DISADVANTAGE

When ,ROI = INT.-NEUTRAL-NEITHER ADVANTAGE NOR DISADVANTAGE.

Illu 1 - The following data relate to Strong Ltd:

	` in lakh
Earnings before interest and tax (EBIT)	1,120
Fixed cost	700
Earnings Before Tax (EBT)	320

Calculate the percentage of change in earnings per share, if sales increased by 5%.

Illu 2 - A company had the following Balance Sheet as on March 31, 2015

Liabilities and Equity	` (in Crores)	Assets	` (in Crores)
Equity Share Capital (1 crore shares of ` 10 each)	10	Fixed Assets (Net)	25
Reserves and Surplus	2	Current Assets	15
15% Debentures	20		
Current Liabilities	8		
	40		40

Fixed Costs per annum (excluding interest)	` 8 crores
Variable operating costs ratio	65%
Total Assets turnover ratio	2.5
Income-tax rate	40%

Required: Calculate the following and comment:

(i) Earnings per share (ii) Operating Leverage

(iii) Financial Leverage (iv) Combined Leverage

Illu 3 - A firm has sales of ` 75,00,000 variable cost of ` 42,00,000 and fixed cost of ` 6,00,000. It has a debt of ` 45,00,000 at 9% and equity of ` 55,00,000.

(i) What is the firm's ROI ?

(ii) Does it have favourable financial leverage ?

(iii) If the firm belongs to an industry whose asset turnover is 3, does it have high or low asset leverage?

(iv) What are the operating, financial and combined leverage of the firm ?

(v) If the sales drop to ` 50,00,000 what will be the new EBIT ?

(vi) At what level the EBIT of the firm, PBT will be equal zero ?

Illu 4 - Betatronics Ltd. Has the following balance sheet and income statement information:

Liabilities	(`)	Assets	(`)
Equity capital (` 10 per share)	8,00,000	Net fixed assets	10,00,000
10% Debt	6,00,000	Current assets	9,00,000
Retained earnings	3,50,000		
Current liabilities	1,50,000		
	19,00,000		19,00,000

Income Statement for the year ending March 31

	(`)
Sales	3,40,000
Operating expenses (including ` 60,000 depreciation)	1,20,000
EBIT	2,20,000
Less: Interest	60,000
Earnings before tax	1,60,000
Less: Taxes	56,000
Net Earnings (EAT)	1,04,000

(a) Determine the degree of operating, financial and combined leverages at the current sales level, if all operating expenses, other than depreciation, are variable costs.

(b) If total assets remain at the same level, but sales (i) increase by 20 percent and (ii) decrease by 20 percent, what will be the earnings per share at the new sales level?

Illu 5 - From the following information, prepare Income Statement of Company A & B:

Particulars	Company A	Company B
Margin of safety	0.20	0.25
Interest	` 3,000	` 2,000
Profit volume ratio	25%	33.33%
Financial Leverage	4	3
Tax rate	45%	45%

Illu 6 - The Sale revenue of TM excellence Ltd. @ ` 20 Per unit of output is ` 20 lakhs and Contribution is ` 10 lakhs. At the present level of output, the DOL of the company is 2.5. The company does not have any Preference Shares. The number of Equity Shares are 1 lakh. Applicable corporate Income Tax rate is 50% and the rate of interest on Debt Capital is 16% p.a. CALCULATE the EPS (at sales revenue of ` 20 lakhs) and amount of Debt Capital of the company if a 25% decline in Sales will wipe out EPS.

Illu 7 - The following particulars relating to Navya Ltd. for the year ended 31st March 2021 is given:

Output	1,00,000 units at normal capacity
Selling price per unit	₹ 40
Variable cost per unit	₹ 20
Fixed cost	₹ 10,00,000

The capital structure of the company as on 31st March, 2021 is as follows:

Particulars	₹
Equity share capital (1,00,000 shares of ₹ 10 each)	10,00,000
Reserves and surplus	5,00,000
7% debentures	10,00,000
Current liabilities	5,00,000
Total	30,00,000

Navya Ltd. has decided to undertake an expansion project to use the market potential, that will involve ₹ 10 lakhs. The company expects an increase in output by 50%. Fixed cost will be increased by ₹ 5,00,000 and variable cost per unit will be decreased by 10%. The additional output can be sold at the existing selling price without any adverse impact on the market.

The following alternative schemes for financing the proposed expansion programme are planned:

(i) Entirely by equity shares of ₹ 10 each at par.

(ii) ₹ 5 lakh by issue of equity shares of ₹ 10 each and the balance by issue of 6% debentures of ₹ 100 each at par.

(iii) Entirely by 6% debentures of ₹ 100 each at par.

FIND out which of the above-mentioned alternatives would you recommend for Navya Ltd. with reference to the risk and return involved, assuming a corporate tax of 40%.

Illu 8 - Information of A Ltd. is given below:

Sales	5,00,000
(-) Variable cost @ 40%	2,00,000
Contribution	3,00,000
(-) Fixed cost	2,00,000
EBIT	1,00,000
(-) Interest	25,000
Profit before tax	75,000

Using the concept of leverage, find out

(i) The percentage change in taxable income if EBIT increases by 10%.

(ii) The percentage change in EBIT if sales increases by 10%.

(iii) The percentage change in taxable income if sales increases by 10%. Also verify the results in each of the above case.

MANAGEMENT OF RECEIVABLES

EVALUATION OF CREDIT POLICY

Particulars	Present Policy	Alt 1	Alt 2
Sales			
Less: Variable Cost (% OF SALES)			
Contribution			
Less: Fixed Cost			
Gross Profit			
Less: Bad Debt (% OF SALES)			
Less: Collection cost			
Less: Cash Discount			
EBT			
Less: Tax			
EAT			
Less: Opportunity Cost			

KEY NOTES RELATING TO INCOME STATEMENT

1. Sale Value = Sales qty X SP/unit

2. Variable Cost

- VC % on sale will always remain constant

Contribution % on sales / PV Ratio + VC % on sales = 100%

- Variable cost/unit will always remain constant.

3.Fixed cost in total will always remain constant.

Fixed cost = (total cost/unit-variable cost/unit) x no.of unit at present level of sales.

4. OPPORTUNITY COST=TOTAL COST* X CREDIT PERIOD X INTEREST RATE*** 360/52/12**

***If fixed cost is not given , then consider only variable cost.**

If fixed cost and variable cost both not given then consider sales.

**** If payment by installment, take weighted average credit period.**

***** Interest rate on post-tax basis, if given on pre–tax , calculate post-tax as = interest rate(pre-tax) X (1-t)**

5. Cash Discount - Payment terms- 2/10 net 30.

EXAM FOOTERS

1.Can solve using total approach or differential approach.

2.If debtor & sales given , calculate credit period= debtor x 360/sales.

FACTORING

Particulars	**Amount**
BALANCE OF RECEIVABLE (**A**)	
Less: Factor fees/commission (% of **A**)	
Less: Reserve (% of **A**)	
B	
Less: Interest (% OF B)	
AMOUNT PAID BY FACTOR	

COST BENEFIT ANALYSIS

Particulars	**Amount**
INCREMENTAL COST	
FACTOR FEES/COMMISSION	
INTEREST	
(A)	
INCREMENTAL GAIN	
SAVINGS IN COLLECTION COST	
SAVINGS IN BAD DEBT	
SAVINGS IN OPPORTUNITY COST (IF SAVINGS IN DAYS)	
(B)	
NET COST A-B	

EFFECTIVE COST OF FACTORING = NET COST X 100

AMOUNT PAID BY FACTOR

Illu 1 - A company is presently having credit sales of ` 12 lakh. The existing credit terms are 1/10, net 45 days and average collection period is 30 days. The current bad debts loss is 1.5%. In order to accelerate the collection process further as also to increase sales, the company is contemplating liberalization of its existing credit terms to 2/10, net 45 days. It is expected that sales are likely to increase by 1/3 of existing sales, bad debts increase to 2% of sales and average collection period to decline to 20 days. The contribution to sales ratio of the company is 22% and opportunity cost of investment in receivables is 15 percent (pre-tax). 50 per cent and 80 percent of customers in terms of sales revenue are expected to avail cash discount under existing and liberalization scheme respectively. The tax rate is 30%. (Assume 360 days in a year).

Illu 2 - As a part of a strategy to increase sales and profit, the Sales Manager of a company proposes to sell goods to a group of new customers with 10% risk of non-payment. This group would require 1.5 month's credit and this is likely to increase sale by ` 1 lac per annum. Production and selling expenses amount to 80% of Sales and the income-tax rate is 50%. The minimum rate of return expected to be earned by the company is 25% (after tax). You are required to comment on the acceptability of the proposal. Also find out the degree of risk of non-payment that the company should be willing to assume if the required rate of returns are 30%, 40% and 60% (after tax)

Illu 3 - PQR Ltd. is considering relaxing its credit policy and evaluating two proposed policies. Currently the firm has annual credit sales of ` 50 lakhs and account receivables of ` 12,50,000. The current level of loss due to bad debt is ` 1,50,000. The firm is to give a return of 20% on investment in the new (additional) accounts receivables. The company's variable costs are 70% of the selling price. The following further information is furnished:

	Present Policy	Policy option I	Policy option II
Annual credit sales	50,00 ,000	60,00,000	67,50,000
Accounts receivables	12,50,000	20,00,000	28,12,500
Bad debts losses	1,50,000	3,00,000	4,50,000

You are the management accountant of the firm. Advise the Managing Director which option should be adopted.

Illu 4 - Slow Payers are regular customers of Goods Dealers Ltd., Calcutta and have approached the sellers for extension of a credit facility for enabling them to purchase goods from Goods Dealers Ltd. On an analysis of past performance and on the basis of information supplied, the following pattern of payment schedule emerges in regard to Slow Payers:

At the end of 30 days	15% of the bill
At the end of 60 days	34% of the bill.
At the end of 90 days	30% of the bill.
At the end of 100 days	20% of the bill.
Non-recovery	1% of the bill.

Slow Payers want to enter into a firm commitment for purchase of goods of ` 15 lakhs in 2013, deliveries to be made in equal quantities on the first day of each quarter in the calendar year. The price per unit of commodity is ` 150 on which a profit of ` 5 per unit is expected to be made. It is anticipated by Goods Dealers Ltd. that taking up of this contract would mean an extra recurring expenditure of ` 5,000 per annum. If the opportunity cost of funds in the hands of Goods Dealers is 24% per annum, would you as the finance manager of the seller recommend the grant of credit to Slow Payers? Workings should form part of your answer. Assume year of 360 days.

Illu 5 - Mosaic Limited has current sales of `15 lakhs per year. Cost of sales is 75 per cent of sales and bad debts are one per cent of sales. Cost of sales comprises 80 per cent variable costs and 20 per cent fixed costs, while the company's required rate of return is 12 per cent. Mosaic Limited currently allows customers 30 days' credit, but is considering increasing this to 60 days' credit in order to increase sales. It has been estimated that this change in policy will increase sales by 15 per cent, while bad debts will increase from one per cent to four per cent. It is not expected that the policy change will result in an increase in fixed costs and creditors and stock will be unchanged. Should Mosaic Limited introduce the proposed policy? (Assume a 360 days year)

Illu 6 - NV Industries Ltd. is a manufacturing industry which manages its accounts receivables internally by its sales and credit department. It supplies small articles to different industries. The total sales ledger of the company stands at ` 200 lakhs of which 80% is credit sales. The company has a credit policy of 2/40, net 120. Past experience of the company has been that on average out of the total, 50% of customers avail of discount and the balance of the receivables are collected on average in 120 days. The finance controller estimated, bad debt losses are around 1% of credit sales. With escalating cost associated with the in-house management of the debtors coupled with the need to unburden the management with the task so as to focus on sales promotion, the CFO is examining the possibility of outsourcing its factoring service for managing its receivables.

Currently, the firm spends about ` 2,40,000 per annum to administer its credit sales. These are avoidable as a factoring firm is prepared to buy the firm's receivables. The main elements of the proposal are :

(i) It will charge 2% commission

(ii) It will pay advance against receivables to the firm at an interest rate of 18% after withholding 10% as reserve.

Consider year as 360 days.

I. What is average level of receivables of the company?

II . How much advance factor will pay against receivables?

III. What is the annual cost of factoring to the company?

IV. What is the net cost to the company on taking factoring service?

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

Illu 7 - Following is the sales information in respect of Bright Ltd :

Annual sales (90% on credit) = 7,50,00,000

Credit Period = 45 days

Average Collection Period =70 days

Bad Debts 0.75%

Credit Administration cost (out of which 2/5th is avoidable) = Rs 18,60,000

A factor firm has offered to manage the company debtor on a non -recourse basis at a service charge of 2%.Factor agrees to grant advance against debtors at an interest rate of 14% after withholding 20% as reserve .Payment period guaranteed by factor is 45 days .The cost of capital of a company is 12.5% .One time redundancy payment of Rs 50000 is required to be made to factor.

Calculate the effective cost of factoring to the company (Assume 360 days)

Illu 8 - Sukrut Limited has annual credit sales of 75,00,000/-. Actual credit terms are 30 days, but its management of receivables has been poor, and the average collection period is about 60 days. Bad debt is 1 per cent of total sales.

A factor has offered to take over the task of debt administration and credit checking, at an annual fee of 1.5 per cent of credit sales. Sukrut Limited estimates that it would save '45,000 per year in administration costs as a result. Due to the efficiency of the factor, the average collection period would come back to the original credit offered of 30 days and bad debts would come to 0.5% on recourse basis. The factor would pay to company at an annual interest rate of 12 per cent after withholding a reserve of 10%. Sukrut Limited is currently financing its receivables from an overdraft costing 10 per cent per year.

COMPUTE whether the factor's services should be accepted or rejected. Assume 360 days in a year

Illu 9 - The turnover of PQR Ltd. is `120 lakhs of which 75 per cent is on credit. The variable cost ratio is 80 per cent. The credit terms are 2/10, net 30. On the current level of sales, the bad debts are 1 per cent. The company spends ` 1,20,000 per annum on administering its credit sales. The cost includes salaries of staff who handle credit checking, collection etc. These are avoidable costs. The past experience indicates that 60 per cent of the customers avail of the cash discount, the remaining customers pay on an average 60 days after the date of sale.

The Book debts (receivable) of the company are presently being financed in the ratio of 1 : 1 by a mix of bank borrowings and owned funds which cost per annum 15 per cent and 14 per cent respectively.

A factoring firm has offered to buy the firm's receivables. The main elements of such deal structured by the factor are:

(i) Factor reserve, 12 per cent

(ii) Guaranteed payment, 25 days

(iii) Interest charges, 15 per cent, and

(iv) Commission 4 per cent of the value of receivables.

Assume 360 days in a year. What advice would you give to PQR Ltd. - whether to continue with the in house management of receivables or accept the factoring firm's offer?

Illu 10 - The Alliance Ltd., a Petrochemical sector company had just invested huge amount in its new expansion project. Due to huge capital investment, the company is in need of an additional ` 1,50,000 in working capital immediately. The Finance Manger has determined the following three feasible sources of working capital funds:

(i) Bank loan: The Company's bank will lend ` 2,00,000 at 15%. A 10% compensating balance will be required, which otherwise would not be maintained by the company.

(ii) Trade credit: The company has been offered credit terms from its major supplier of3/30, net 90 for purchasing raw materials worth ` 1,00,000 per month.

(iii) Factoring: A factoring firm will buy the company's receivables of ` 2,00,000 per month, which have a collection period of 60 days. The factor will advance up to 75% of the face value of the receivables at 12% on an annual basis. The factor will also charge commission of 2% on all receivables purchased. It has been estimated that the factor's services will save the company a credit department expense and bad debt expense of ` 1,250 and ` 1,750 per month respectively.

On the basis of annual percentage cost, ADVISE which alternative should the company select? Assume 360 days year.

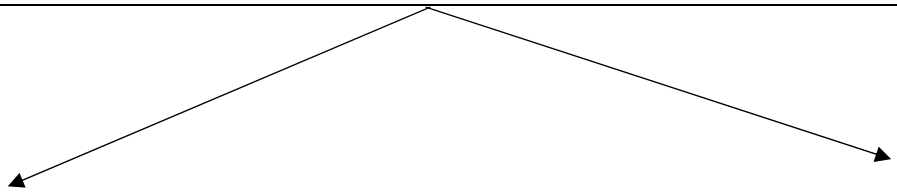
WORKING CAPITAL MANAGEMENT

TYPES OF WORKING CAPITAL

GROSS WORKING CAPITAL

NET WORKING CAPITAL

APPROACH OF WORKING CAPITAL



TOTAL APPROACH

- **Depreciation will be included in factory overhead.**
- **Debtors will be valued on sales**

CASH COST APPROACH

- **Depreciation will NOT be included in factory O/H**
- **Debtors will be valued on total cost**

WORKING CAPITAL ESTIMATION (EXISTING COMPANY)- COST SHEET		
1.	RAW MATERIAL CONSUMED	xx
2.	DIRECT WAGES	xx
3.	PRIME COST	xx
4.	FACTORY OVERHEAD	xx
5.	FACTORY COST/WORKS COST	xx
6.	OFFICE & ADMINISTRATIVE OVERHEAD (general)	xx
7.	SELLING AND DISTRIBUTION OVERHEAD	xx
8.	TOTAL COST	xx

COMPUTATION OF CURRENT ASSETS AND CURRENT LIABILITIES

SL NO.	PARTICULARS	COMPUTATION
	A CURRENT ASSETS	
1.	RAW MATERIAL STOCK	
2,	WORK IN PROGRESS	
3.	FG STOCK	
4.	DEBTORS	
	B. CURRENT LIABILITIES	
5.	CREDITORS	
6.	Outstanding Wages / Expenses	

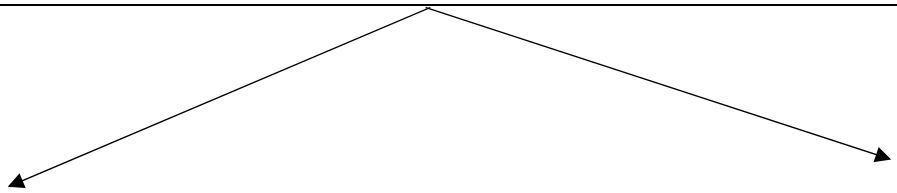
NOTES :-

1) DEBTOR - IF CASH COST APPROACH IS FOLLOWED , THEN CONSIDER AT TOTAL COST.

2) CONVERSION COST = DIRECT WAGES + PRODUCTION OVERHEAD

3) IN ABSENCE OF ANY SPECIFIC INFORMATION, WE SHOULD ASSUME THAT WIP IS 100% IS COMPLETE IN RESPECT OF MATERIAL & 50% IN CASE OF CONVERSION COST.

SAFETY MARGIN /PROVISION FOR CONTINGENCY TO BE ADDED TO NET WORKING CAPITAL REQUIREMENT



@ 10% OF NET WORKING CAPITAL

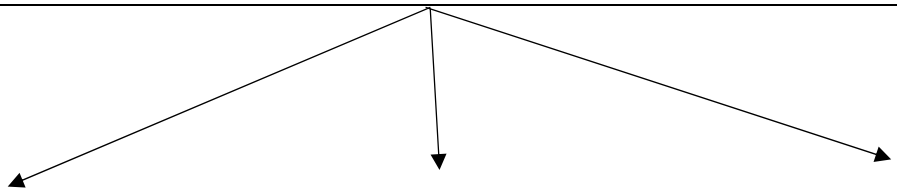
@ 10% OF NET WORKING CAPITAL INCLUDING THAT PROVISION

Working capital in case of a new company having 1st year of operation Only one change in cost sheet, we will consider closing raw material,WIP, FG (opening stock = 0)

SL NO.	PARTICULARS	AMOUNT
1.	**Purchase of raw material (b.f.)**	XX
2.	**(-) Closing raw material * (a)**	(XX)
3.	**Raw material consumed**	XX
4.	**Direct wages**	XX
5.	**Factory overhead**	XX
6.	**(-) Closing WIP *(b)**	(XX)
7.	**Factory/works cost**	XX
8.	**(-)Closing FG *(c)**	(XX)
9.	**COGS**	XX
10.	**Office & administrative overhead**	XX
11.	**Selling & distribution overhead**	XX
12.	**Total cost**	XX

* a) Raw material consumed X Raw material holding period / 360/12/52
* b) (WIP UNITS X RAW MATERIAL/UNIT X DOC) + (WIP UNITS X CONVERSION COST/ UNIT X DOC)
*c) Factory/works cost X closing FG units / Units Produced
CURRENT ASSET :-
Raw material ,Work in progress, & finished goods to be taken from cost sheet

MPBF AS PER TANDON COMMITTEE



EFFECT OF CHANGE IN NUMBER OF SHIFTS ON WORKING CAPITAL

ELEMENT	TREATMENT / IMPACT
PRODUCTION (UNITS)	
SALES (UNITS)	
RM STOCK (UNITS)	
FG STOCK (UNITS)	
DEBTORS (UNITS)	
CREDITORS (UNITS)	
FIXED COST (IN TOTAL)	
VARIABLE COST / UNIT	
WIP STOCK (UNITS)	

OPERATING CYCLE

SL.NO.	PARTICULARS	COMPUTATION
1.	**Raw material holding period**	
2.	**Work in progress holding period**	
3.	**Finished goods holding period**	
4.	**Debtors collection period**	
5.	**Creditors payment period**	

OPERATING CYCLE =
No. of operating cycle =
Working Capital requirement =

Illu 1 - The following information has been extracted from the records of a Company:

Product cost sheet	`/unit
Raw materials	45
Direct labour	20
Overheads	40
Total	105
Profit	15
Selling price	120

(i) Raw materials are in stock on an average is for two months.
(ii) The materials are in process on an average for 4 weeks. The degree of completion 50 %.
(iii) Finished goods stock on an average is for one month.
(iv) Time lag in payment of wages and overheads is 1 and a half weeks.
(v) Time lag in receipt of proceeds from debtors is 2 months.
(vi) Credit allowed by suppliers is one month,
(vii) 20% of the output is sold against cash.
(viii) The company expects to keep a cash balance of `1,00,000.
(ix) Take 52 weeks per annum.

The company is poised for a manufacture of 1,44,000 units in the year. You are required to prepare a statement showing the Working Capital requirements of the Company.

Illu 2 - ESS Ltd. sells goods at a gross profit of 25% considering depreciation as part of the cost of production. Its annual figures are as follows:-

Sales at two months credit	18,00,000
Materials consumed (suppliers extend two months' credit)	4,50,000
Wages paid (monthly in arrear)	3,60,000
Manufacturing expenses outstanding at the end of the year (cash expenses are paid one month in arrear)	40,000
Total Administrative Expenses, paid as above	1,20,000
Sales promotion expenses, paid quarterly in advance	60,000

The company keeps one month's stock each of raw materials and finished goods, and believes in keeping ` 1,00,000 in cash. Assuming a 15% safety margin, ascertain the requirements of working capital requirement of the company on cash costs basis. Ignore work-in-progress.

Illu 3 - The management of MNP Company Ltd. is planning to expand its business and consults you to prepare an estimated working capital statement. The records of the company reveal the following annual information:

Sales –Domestic at one month's credit	24,00,000
Export at three month's credit (sales price 10% below domestic price)	10,80,000
Materials used (suppliers extend two months credit)	9,00,000
Lag in payment of wages – ½ month	7,20,000
Lag in payment of manufacturing expenses (cash) – 1 month	10,80,000
Lag in payment of Adm. Expenses – 1 month	2,40,000
Sales promotion expenses payable quarterly in advance	1,50,000
Tax payable in four installments of which one falls in the next financial year	2,25,000

Rate of gross profit is 20%.
Ignore work-in-progress and depreciation.
The company keeps one month's stock of raw materials and finished goods (each) and believes in keeping ` 2,50,000 available to it including the overdraft limit of ` 75,000 not yet utilized by the company. The management is also of the opinion to make 12% margin for contingencies on computed figure. You are required to prepare the estimated working capital statement for the next year.

Illu 4 - PQ Ltd., a company newly commencing business in 2013 has the under mentioned projected Profit and Loss Account:

	`	`
Sales		2,10,000
Cost of goods sold		1,53,000
Gross Profit		57,000
Administrative Expenses	14,000	
Selling Expenses	13,000	27,000
Profit before tax		30,000
Provision for taxation		10,000
Profit after tax		20,000
The cost of goods sold has been arrived at as under:		
Materials used	84,000	
Wages and manufacturing Expenses	62,500	
Depreciation	23,500	
	1,70,000	
Less: Stock of Finished goods		
(10% of goods produced not yet sold)	17,000	
	1,53,000	

The figure given above relate only to finished goods and not to work-in-progress. Goods equal to 15% of the year's production (in terms of physical units) will be in process on the average requiring full materials but only 40% of the other expenses. The company believes in keeping materials equal to two months' consumption in stock.
Average time-lag in payment of all expenses is I month. Suppliers of materials will extend 1-1/2 months credit. Sales will be 20% for cash and the rest at two months' credit. 70% of the Income tax will be paid in advance in quarterly installments. The company wishes to keep ` 8,000 in cash. 10% has to be added to the estimated figure for unforeseen contingencies. Prepare an estimate of working capital.

Illu 5 - A newly formed company has applied to the commercial bank for the first time for financial its working capital requirements. The following information is available about the projections for the current year:

Estimated level of activity : 1,04,000 completed units of production plus 4,000 units of work-in-progress. Based on the above activity estimated cost per unit is :

	(` Per unit)
Raw Material	80
Direct Wages	30
Overheads (exclusive of depreciation)	60
Total cost	170
Selling price	200

Raw materials in stock: average 4 weeks consumption work-in-progress (assume 50% completion stage in respect of conversion cost) (materials issued at the start of the processing).

Finished goods in stock 8,000 units

Credit allowed by suppliers Average 4 weeks

Credit allowed to debtors/receivables Average 8 weeks

Lag in payment of wages. Average 1 ½ weeks

Cash at banks (for smooth operation) is expected to be ` 25,000

Assume that production is carried on evenly throughout the year (52 weeks) and wages and overheads accrue similarly. All sales are on credit basis only. Find out the net working capital required

Illu 6 - Samreen Enterprises has been operating its manufacturing facilities till 31.3.2013 on a single shift working with the following cost structure:

	(` Per unit)
Cost of Materials	6.00
Wages (out of which 40% fixed)	5.00
Overheads (out of which 80% fixed)	5.00
Profit	2.00
Selling Price	18.00

Sales during 2012-13 – ` 4,32,000. As at 31.3.2013 the company held:

	(`)
Stock of raw materials (at cost)	36,000
Work-in-progress (valued at prime cost)	22,000
Finished goods (valued at total cost)	72,000
Sundry debtors	1,08,000

In view of increased market demand, it is proposed to double production by working an extra shift. It is expected that a 10% discount will be available from suppliers of raw materials in view of increased volume of business. Selling price will remain the same. The credit period allowed to customers will remain unaltered. Credit availed of from suppliers will continue to remain at the present level i.e., 2 months. Lag in payment of wages and expenses will continue to remain half a month.

You are required to assess the additional working capital requirements, if the policy to increase output is implemented.

Illu 7 - The following annual figures relate to manufacturing entity:

A. Sales at one month credit 84,00,000

B. Material consumption 60% of sales value

C. Wages (paid in a lag of 15 days) 12,00,000

D. Cash Manufacturing Expenses 3,00,000

E. Administrative Expenses 2,40,000

F. Creditors extend 3 months credit for payment.

G. Cash manufacturing and administrative expenses are paid 1 months in arrear.

The company maintains stock of raw material equal to economic order quantity. The company incurs ‘ 100 as per ordering cost per order and opportunity cost of capital is 15% p.a. The optimum cash balance is determined using Baumol’s model. The bank charges ‘ 10 for each cash withdrawal. Finished goods are held in stock for 1 month. The company maintains a bank balance of ` 12,00,000 on an average. Creditors are paid through net banking and all other expenses are incurred in cash which is withdrawn from bank.

Assuming a 20% safety margin, you are required to ESTIMATE the amount of working capital that needs to be invested by the Company.

Illu 8 - While applying for financing of working capital requirements to a commercial bank, TN Industries Ltd. projected the following information for the next year:

Cost Element	Per unit (`)	Per unit (`)
Raw materials		
X	30	
Y	7	
Z	6	43
Direct Labour		25
Manufacturing and administration overheads		
(excluding depreciation)		20
Depreciation		10
Selling overheads		15
		113

Additional Information:

(a) Raw Materials are purchased from different suppliers leading to different credit period allowed as follows:

X – 2 months; Y– 1 months; Z – ½ month

(b) Production cycle is of ½ month. Production process requires full unit of X and Y in the beginning of the production. Z is required only to the extent of half unit in the beginning and the remaining half unit is needed at a uniform rate during the production process.

(c) X is required to be stored for 2 months and other materials for 1 month.

(d) Finished goods are held for 1 month.

(e) 25% of the total sales is on cash basis and remaining on credit basis. The credit allowed by debtors is 2 months.

(f) Average time lag in payment of all overheads is 1 months and ½ months for directlabour.

(g) Minimum cash balance of ` 8,00,000 is to be maintained.

CALCULATE the estimated working capital required by the company on cash cost basis if the budgeted level of activity is 1,50,000 units for the next year. The company also intends to increase the estimated working capital requirement by 10% to meet the contingencies. (You may assume that production is carried on evenly throughout the year and direct labour and other overheads accrue similarly.)

Illu 9 - A company is considering its working capital investment and financial policies for the next year. Estimated fixed assets and current liabilities for the next year are ` 2.60 crores and ` 2.34 crores respectively. Estimated Sales and EBIT depend on current assets investment, particularly inventories and book-debts. The financial controller of the company is examining the following alternative Working Capital Policies:

Working Capital Policy	Investment in CurrentAssets	Estimated Sales	(` Crores) EBIT
Conservative	4.50	12.30	1.23
Moderate	3.90	11.50	1.15
Aggressive	2.60	10.00	1.00

After evaluating the working capital policy, the Financial Controller has advised the adoption of the moderate working capital policy. The company is now examining the use of long-term and short-term borrowings for financing its assets. The company will use ` 2.50 crores of the equity funds. The corporate tax rate is 35%. The company is considering the following debt alternatives.

Financing Policy	Short-term Debt	(` Crores) Long-term Debt
Conservative	0.54	1.12
Moderate	1.00	0.66
Aggressive	1.50	0.16
Interest rate-Average	12%	16%

You are required to CALCULATE the following:

(i) Working Capital Investment for each policy:

(a) Net Working Capital position

(b) Rate of Return

(c) Current ratio

(ii) Financing for each policy:

(a) Net Working Capital position

(b) Rate of Return on Shareholders' equity.

(c) Current ratio.

CASH MANAGEMENT

CASH MANAGEMENT MODELS

BAUMOL MODEL

OPTIMUM TRANSACTION SIZE = √2AT/C

A denotes Annual Cash Requirement.

T is Transaction cost/ transaction

C is Carrying Cost per rupee per annum.

Where C is expressed as a % (ex:-5%), **C= 1 X 5%= 0.05**

EVALUATION OF AN ALTERNATIVES

PARTICULARS	ALT 1	ALT 2	ALT 3
A)Annual cash requirement	XX	XX	XX
B)LOT SIZE/TRANSACTION	XX	XX	XX
C)NO.OF TRANSACTION (A/B)	XX	X X	XX
D) TRANSACTION COST (c x TC/TRANSACTION)	XX	XX	XX
E) Carrying cost (B/2 x Carrying cost PUPA)	xx	xx	xx
TOTAL COST(D+E)	XX	XX	XX

MILLER ORR MODEL

CASH BUDGET

PARTICULARS	1	2	3	4
Opening Balance (A)				
Receipts (B)				
Cash Sales				
Collection from Debtors				
Sale of Investment / Fixed Asset				
Interest / Dividend Received				
Total (A + B)				
Payment (C)				
Cash Purchase				
Payment to creditor / supplier				
Purchase of Investment / Fixed Asset				
Interest / Dividend paid				
Income tax paid				
Wages and overhead paid				
Balance (A + B – C)				
Loan taken				
Loan repaid				
Interest paid				
Closing Balance				

SPECIAL POINTS

1. **Planning of closing cash balance**

2. **Collection from Debtors and payment to creditors**

A. **Opening and Closing Debtors / Creditors, Sales and COGS**

B. Pattern of collection

3. Payment of wages and overhead – Lag period

The following information is provided by the DPS Limited for the year ending 31stMarch, 2013.

Raw material storage period 55 days

Work-in-progress conversion period 18 days

Finished Goods storage period 22 days

Debt collection period 45 days

Creditors' payment period 60 days

Annual Operating cost ` 21,00,000

(Including depreciation of ` 2,10,000)

[1 year = 360 days]

(i) Operating Cycle period. (ii) Number of Operating Cycle in a year.

(iii) Amount of working capital required for the company on a cash cost basis.

(iv) The company is a market leader in its product, there is virtually no competitor in the market. Based on a market research it is planning to discontinue sales on credit and deliver products based on pre- payments. Thereby, it can reduce its working capital requirement substantially.

What would be the reduction in working capital requirement due to such decision?

Following information is forecasted by the CS Limited for the year ending 31st march, 2010:

	Balance as at 1st April, 2009 `	Balance as at 31st March, 2010
Raw Material	45,000	65,356
Work-in-progress	35,000	51,300
Finished goods	60,181	70,175
Debtors	1,12,123	1,35,000
Creditors	50,079	70,469
Annual purchases of raw material (all credit)		4,00,000
Annual cost of production		7,50,000
Annual cost of goods sold		9,15,000
Annual operating cost		9,50,000
Annual sales (all credit)		11,00,000

Prepare a Cash Budget for the three months ending 30th June, 2006 from the information given below:

(a) Month	Sales	Materials	Wages	Overheads
February	` 14,000	` 9,600	` 3,000	` 1,700
March	15,000	9,000	3,000	1,900
April	16,000	9,200	3,200	2,000
May	17,000	10,000	3,600	2,200
June	18,000	10,400	4,000	2,300

(b) Credit terms are:-

Sales/Debtor – 10% sales are on cash, 50% of the credit sales are collected next month and the balance in the following month.

Creditors' — Materials 2 months

— Wages ¼ month

— Overheads ½ month

(c) Cash and Bank balance on 1st April, 2006 is expected to be ` 6,000.

(d) Other relevant information is:

(i) Plant and Machinery will be installed in February 2006 at a cost of ` 96,000. The monthly installments of ` 2,000 is payable from April onwards.

(ii) Dividend @ 5% on Preference Share Capital of 2,00,000 will be paid on 1st June.

(iii) Advance to be received for sale of vehicles ` 9,000 in June.

(iv) Dividends from investments amounting to ` 1,000 are expected to receive in June.

(v) Income tax (advance) to be paid in June is ` 2,000.

Based on the following information prepare a cash budget for ABC Ltd.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Opening cash balance	` 10,000			
Collection from customers	` 1,25,000	` 1,50,000	` 1,60,000	` 2,21,000
Payment:				
Purchase of materials	20,000	35,000	35,000	54,200
Other expenses	25,000	20,000	20,000	17,000
Salary and wages	90,000	95,000	95,000	1,09,200
Income tax	5,000	–	–	–
Purchase of machinery	–	–	–	20,000

The company desires to maintain a cash balance of ` 15,000 at the end of the each quarter. Cash can be borrowed or repaid in multiples of ` 500 at an interest of 10% per annum. Management does not want to borrow cash more than what is necessary and wants to repay as early as possible. In any event, loans cannot be extended beyond four quarters. Interest is computed and paid when repayment is made at the end of the quarter.

From the following information relating to a departmental store for the three months period ending 31st January, 1987, you are required to prepare the following:

Monthly cash budget on receipts and payments basis, and

Budgeted Profit Statement

	000's		
	November	December	January
Sales	2,100	1,800	1,700
Cost of Goods Sold	1,635	1,405	1,330
Gross profit	465	395	370
Administrative, Selling and Distribution	315	270	255
Expenses and Interest			
Net profit prior to tax	150	125	115

Budgeted Balances at the end of each month

	000's			
	1st November	30th November	31st December	31st January
Short Term Investments	300	700	---	200
Debtors	2,570	2,600	2,500	2,350
Stock	1,300	1,200	1,100	1,000
Trade Creditors	2,110	2,000	1,950	1,900
Other Creditors	200	200	200	200
Dividend Due	485	485	---	---
Tax Due	320	320	320	320
Cash in hand and at bank	545			

Depreciation amounting to ` 60,000 is included in the budgeted expenditure for each month. Capital expenditure amounting to ` 8,00,000 is expected to be incurred during December 1986 and proceeds from the sale of plant and equipment of ` 50,000 is expected in January, 1987.

RATIO ANALYSIS

PROFITABILITY RATIO BASED ON SALES:-

- GROSS PROFIT RATIO = GROSS PROFIT * 100 / SALES
- NET PROFIT RATIO = NET PROFIT * 100 / SALES
- OPERATING PROFIT RATIO = OPERATING PROFIT * 100 / SALES
- PROFIT VOLUME RATIO = CONTRIBUTION * 100 / SALES

EXPENSES RATIO :-{EXPRESSED IN %}

- COST OF GOODS SOLD RATIO {COGS} = COGS / SALES
- OPERATING EXP. RATIO = ADMIN + SELLING & DIST.EXP / SALES
- OPERATING RATIO = COGS + OPERATING EXPENSES / SALES.

PROFITABILITY RATIO RELATED TO OVERALL RETURN ON INVESTMENTS/ ASSETS:-

- RETURN ON INVESTMENT (ROI) = EARNINGS BEFORE INTEREST AND TAX X 100 / INVESTMENTS
- RETURN ON ASSETS (ROA) = NET PROFIT AFTER TAXES / AVG NET ASSETS
- RETURN ON SHAREHOLDERS FUND = EAT x 100 / SHAREHOLDERS FUND
- RETURN ON EQUITY = EARNINGS AVAILABLE FOR EQUITY SHAREHOLDER / NET WORTH / EQUITY SHAREHOLDERS CAPITAL

SPECIAL NOTE:

ACTIVITY RATIO/ EFFICIENCY RATIO./ TURNOVER RATIO / PERFORMANCE RATIO

- **TOTAL ASSET TURNOVER RATIO** = **SALES/COGS AVG.TOTAL ASSETS.**
- **FIXED ASSET TURNOVER RATIO** = **SALES/COGS FIXED ASSETS.**
- **CAPITAL TURNOVER RATIO** = **SALES/COGS NET ASSETS.**
- **WORKING CAPITAL TURNOVER RATIO** = **SALES /COGS WORKING CAPITAL**
- **INVENTORY TURNOVER RATIO** = **COGS/SALES AVG INVENTORY**
- **DEBTORS TURNOVER RATIO** = **CREDIT SALES AVG ACCOUNT RECEIVABLE**
- **RECEIVABLE`S (DEBTORS) VELOCITY** = **AVG ACCOUNT RECEIVABLES AVG DAILY CREDIT SALES.**
- **PAYABLE TURNOVER RATIO** = **ANNUAL NET CREDIT PURCHASES AVG ACCOUNTS PAYABLES**
-

COVERAGE RATIO

- DEBT SERVICE COVERAGE RATIO = EARNING AVAILABLE FOR DEBT SERVICES / INTEREST + INSTALLMENTS

- INTEREST COVERAGE RATIO = EBIT / INTEREST

- PREFERENCE DIVIDEND COVERAGE RATIO = NET PROFIT / EAT / PREF.DIVIDEND LIABILITY

PROFITABILITY RATIO REQUIRED FOR ANALYSIS FROM OWNERS POINT OF VIEW

- EARNING/SHARE(EPS) = NET PROFIT AVAILABLE TO EQUITY SHAREHOLDERS / NUMBER OF EQUITY SHARE OUTSTANDINGS
- DIVIDEND/SHARE(DPS) = DIVIDEND PAID TO EQUITY SHAREHOLDERS / NUMBER OF EQUITY SHARE OUTSTANDINGS
- DIVIDEND PAYOUT RATIO = DIVIDEND PER EQUITY SHARE / EARNING PER SHARE

PROFITABILITY RATIOS RELATED TO MARKETS/ VALUATION/INVESTORS:-

- PRICE – EARNING PER SHARE = MARKET PRICE PER SHARE / EARNING PER SHARE.
- DIVIDEND YIELD = DIVIDEND PER SHARE (DPS) X 100 / MARKET PRICE PER SHARE (MPS)
- EARNINGS YIELD = EARNING PER SHARE X 100 / MARKET PRICE PER SHARE (MPS)
- MARKET VALUE/ BOOK VALUE PER SHARE = MARKET VALUE PER SHARE / BOOK VALUE PER SHAR

LIQUIDITY RATIO :-

- CURRENT RATIO = CURRENT ASSETS / CURRENT LIABILITIES
- QUICK RATIO = QUICK ASSETS / CURRENT LIABILITIES
- CASH RATIO = [CASH & BANK BALANCES + MARKETABLE SECURITIES] / CURRENT LIABILITIES.

CAPITAL STRUCTURE RATIO :-

- EQUITY RATIO = SHAREHOLDERS EQUITY / CAPITAL EMPLOYED.
- DEBT RATIO = TOTAL OUTSIDE LIABILITIES / TOTAL DEBT + NET WORTH.
- DEBT TO EQUITY RATIO = TOTAL OUTSIDE LIABILITIES / SHAREHOLDERS EQUITY
- PROPRIETORY RATIO = PROPRIETY FUND / TOTAL ASSETS.

Illu 1 - The following figures and ratios are related to a company:

(1) Sales for the year (all credit) ` 30,00,000

(2) Gross Profit ratio 25 percent

(3) Fixed assets turnover (basis on cost of goods sold) 1.5

(4) Stock turnover (basis on cost of goods sold) 6

(5) Liquid ratio 1: 1

(6) Current ratio 1.5: 1

(7) Debtors collection period 2 months

(8) Reserve and surplus to Share capital 0.6: 1

(9) Fixed assets to net worth 1.20: 1

You are required to prepare Balance Sheet of the company on the basis of above details.

Illu 2 - Prepare Balance sheet from the following information:-

Capital	4,00,000
Working Capital	1,80,000
Bank Overdraft	30,000

There are no fictitious assets. In current assets there are no assets other than stock, debtors and cash. Closing stock is 20% higher than opening stock.

(i)	Current Ratio – 2.5
(ii)	Quick Ratio – 2 (Quick Asset / Quick Liability)
(iii)	Proprietary Ratio 0.6 (Fixed Assets / Proprietary Fund)
(iv)	Gross Profit Ratio –20% to sales
(v)	Stock velocity –5
(vi)	Debtor's velocity –73 days
(vii)	Assumed 365 days in a year

Illu 3 - From the following information and ratios, prepare the Profit and Loss A/c for the year ended 31st March, 2015, and the Balance Sheet as on that date of M/s. Start & Co.

Current Assets to stock	3:2
Current Ratio	3.00
Acid Test Ratio	1.00
Financial Leverage	2.20
Earnings per Share (each of `10)	10.00
Book Value per Share (`)	40.00
Average Collection Period (assume 360 days in the year)	30 days
Stock Turnover Ratio (on sales)	5.00
Fixed Asset / Turnover Ratio	1.20
Total Liabilities to Net Worth	2.75
Net Working Capital	` 10 lakhs
Net profit to Sales	10%
Variable Cost	60%
Long Term Loan Interest	12%
Taxation	Nil

Illu 4 - Using the information given below, PREPARE the Balance Sheet of SKY Private Limited:

(i)	Current ratio	1.6 :1
(ii)	Cash and Bank balance	15% of total current assets
(iii)	Debtors turnover ratio	12 times
(iv)	Stock turnover (cost of goods sold) ratio	16 times
(v)	Creditors turnover (cost of goods sold) ratio	10 times
(vi)	Gross profit ratio	20%
(vii)	Capital gearing ratio	0.6
(viii)	Depreciation rate	15% on W.D.V.
(ix)	Net fixed Assets	20% of total assets

(Assume all purchase and sales are on credit)

Balance Sheet of SKY Private Limited as at 31.03.2020

Liabilities	**Amount in `**	**Assets**	**Amount in `**	
Share Capital	25,00,000	Fixed assets		
Reserve & surplus	?	Opening WDV	?	
12% Long term debt	?	Less: Depreciation	?	?
Current liabilities				
Creditors	?	**Current Assets**		
Provisions & outstanding expenses ?	68,50,000	Stock	?	
		Debtors	?	
		Cash and bank balance	?	?
Total	**?**	**Total**		**?**

(Detailed working notes are not required to be shown)

Illu 5 - Manan Pvt. Ltd. gives you the following information relating to the yearending 31st March, 2023:

(1)	Current Ratio	2.5 : 1
(2)	Debt-Equity Ratio	1 : 1.5
(3)	Return on Total Assets (After Tax)	15%
(4)	Total Assets Turnover Ratio	2
(5)	Gross Profit Ratio	20%
(6)	Stock Turnover Ratio	7
(7)	Net Working Capital	` 13,50,000
(8)	Fixed Assets	` 30,00,000
(9)	1,80,000 Equity Shares of	` 10 each
(10)	60,000, 9% Preference Shares of	` 10 each
(11)	Opening Stock	` 11,40,000

You are required to CALCULATE:

(a) Quick Ratio

(b) Fixed Assets Turnover Ratio

(c) Proprietary Ratio

(d) Earnings per Share

Illu 6 - From the following information, you are required to PREPARE a summarised Balance Sheet for Rudra Ltd. for the year ended 31st March, 2022

Debt Equity Ratio	1:1
Current Ratio	3:1
Acid Test Ratio	8:3
Fixed Asset Turnover (on the basis of sales)	4
Stock Turnover (on the basis of sales)	6
Cash in hand	5,00,000
Stock to Debtor	1:1
Sales to Net Worth	4
Capital to Reserve	1:2
Gross Profit	20% of Cost
COGS to Creditor	10:1

Interest for entire year is yet to be paid on Long Term loan @ 10%

Illu 7 - From the following ratios and information given below, PREPARE Trading Account,Profit and Loss Account and Balance Sheet of Aebece Company:

Fixed Assets	` 40,00,000
Closing Stock	` 4,00,000
Stock turnover ratio	10
Gross profit ratio	25 percent
Net profit ratio	20 percent
Net profit to capital	1/5
Capital to total liabilities	1/2
Fixed assets to capital	5/4
Fixed assets/Total current assets	5/7

COST OF CAPITAL

COMPONENTS OF COST OF CAPITAL

COST OF DEBT | COST OF PREFERENCE | COST OF EQUITY | COST OF RETAINED EARNINGS

COST OF DEBT

IRREDEEMABLE DEBENTURES | **REDEEMABLE DEBENTURES**

Note: Interest / Coupon will be calculated on FACE VALUE.

Impact of Floatation Cost

COST OF PREFERENCE SHARES

IRREDEEMABLE PREFERENCE SHARES

REDEEMABLE PREFERENCE SHARES

Note: Preference Dividend will be calculated on FACE VALUE.

COST OF EQUITY SHARES

A. **Dividend price model**

B. **Earning price model**

C. **Div growth model/ GORDON model**

Note -

1. **Calculation of expected dividend (D1)**

2. **Calculation of growth**

D. **Earning growth model**

E. CAPM

COST OF RETAINED EARNINGS

WITHOUT PERSONAL TAX RATE

WITH PERSONAL TAX RATE

WEIGHTED AVERAGE OF CAPITAL

BOOK VALUE WEIGHTS

Balance sheet value.

MARKET VALUE WEIGHTS

Debentures/equity/Pref :- No. of shares x MPS.

Market value of equity needs to be apportioned between equity shares & retained earnings on the basis of their book value.

BV & MV of loan from banks /FI will be same.

SOURCE	AMOUNT	WEIGHT	COST	WACC
EQUITY SHARES			Ke	
RETAINED EARNINGS			Kre	
PREFERENCE SHARES			Kp	
DEBENTURES			Kd	
LOAN			Kd	
		1		

Illu 1 - A company issued 10,000, 15% Convertible debentures of ` 100 each with a maturity period of 5 years. At maturity, the debenture holders will have an option to convert the debentures into equity shares of the company in the ratio of 1:10 (10 shares for each debenture). The current market price of the equity shares is ` 12 each and historically the growth rate of the shares is 5% per annum. Compute the cost of debentures assuming 35% tax rate.

Illu 2 - A Company's share is quoted in market at ` 40 currently. A company pays a dividend of ` 2 per share and investors expect a growth rate of 10% per year, compute:

(i) The company's cost of equity capital.

(ii) If anticipated growth rate is 11% p.a. calculate the indicated market price per share.

(iii) If the company's cost of capital is 16% and anticipated growth rate is 10% p.a. calculate the market price if dividend of ` 2 per share is to be maintained.

Illu 3 - The Beta coefficient of Computech Ltd. is 1.2, the company has been maintaining 5% rate of growth in dividends and earnings. The last dividend paid was ` 2.40 per share. Return on Government securities is 10%. Return on Market portfolio is 14%. The current market price of one share of Computech Ltd. is ` 28. The earnings per share is ` 3.90. Calculate the cost of equity capital sharing basing on: (i) Dividend yield method (ii) Dividend growth model (iii) Capital asset pricing mode (iv) Earnings price model.

Illu 4 - From the following information, calculate the cost of equity (Ke):

Risk-free rate of interest	12%
Expected return of market portfolio	18%
Standard deviation of an asset	2.8%
Market standard deviation	2.3%
Correlation coefficient of asset with market	0.8

Illu 5 - The capital structure of a company :

Source of capital	Book value	Market value
Equity shares @ ` 100 each	80,00,000	1,60,00,000
9 percent Cumulative preference shares @ ` 100 each	20,00,000	24,00,000
11 percent Debentures	60,00,000	66,00,000
Retained Earnings	40,00,000	
	2,00,00,000	2,50,00,000

The company market price of the company's equity share is ` 200 .For the last year the company had paid equity dividend at 25 percent and its dividends is likely to grow 5 percent every year. The corporate tax rate is 30 percent and shareholders personal income tax rate is 20 percent.

(i) Cost of capital for each source of capital

(ii) Weighted average cost of Capital on the basis of book value weights and on the basis of market value weights.

Illu 6 - You are required to determine the weighted average cost of capital (Ko) of the K.C. Ltd. using (i) book value weights; and (ii) market value weights. The following information is available for your perusal. The K.C. Ltd.'s present book value capital structure is:

		(`)
Debentures	(` 100 per debenture)	8,00,000
Preference shares	(` 100 per share)	2,00,000
Equity shares	(` 10 per share)	10,00,000
		20,00,000

All these securities are traded in the capital markets. Recent prices are debentures @ ` 110, preference shares @ `120 and equity shares @ ` 22. Anticipated external financing opportunities are:

(i) ` 100 per debenture redeemable at par: 20·year maturity, 8% coupon rate, 4% floatation costs, sale price ` 100.

(ii) ` 100 preference share redeemable at par: 15 year maturity, 10% dividend rate, 5% floatation costs, sale price ` 100.

(iii) Equity shares: ` 2 per share floatation cost, sale price ` 22.

In addition, the dividend expected on the equity share at the end of the year is ` 2 per share, the anticipated growth rate in dividends is 5% and the company has the practice of paying all its earning in the form of dividends. The corporate tax rate is 50%.

Illu 7 - ABC Ltd. wishes to raise additional finance of ` 20 lakhs for meeting its investment plans. The company has ` 4,00,000 in the form of retained earnings available for investment purposes. The following are the further details:

(i) Debt equity ratio 25 : 75.

(ii) Cost of debt at the rate of 10 percent (before tax) upto 2,00,000 and 13% (before tax) beyond that.

(iii) Earnings per share ` 12.

(iv) Dividend payout 50% of earnings.

(v) Expected growth rate in dividend 10%

(vi) Current market price per share ` 60.

(vii) Company's tax rate is 30% and shareholder's personal tax rate is 20%.

Required:

(i) Calculate the post tax average cost of additional debt.

(ii) Calculate the cost of retained earnings and cost of equity.

(iii) Calculate the overall weighted average (after tax) cost of additional finance.

Illu 8 - ABC Ltd. has the following capital structure which is considered to be optimum as on 31st March, 2017.

	(`)
16% Debentures	30,000
11% Preference shares	10,000
Equity Shares (10,000 shares)	1,60,000
	2,00,000

The company share has a market price of ` 23.60. Next year dividend per share is 50% of year 2017 EPS. The following is the trend of EPS for the preceding 10 years which is expected to continue in future.

Year	EPS (`)	Year	EPS (`)
2008	1.00	2013	1.61
2009	1.10	2014	1.77
2010	1.21	2015	1.95
2011	1.33	2016	2.15
2012	1.46	2017	2.36

The company issued new debentures carrying 16% rate of interest and the current market price of debenture is ` 96.

Preference share ` 9.20 (with annual dividend of ` 1.1 per share) were also issued. The company is in 50% tax bracket.

(A) Calculate after tax:

(i) Cost of new debt

(ii) Cost of new preference shares

(iii) New equity share (consuming new equity from retained earnings)

(B) Calculate marginal cost of capital when no new shares are issued

(C) How much can be spent for capital investment before new ordinary shares must be sold. Assuming that retained earnings for next year's investment are 50 percent of 2017.

(D) What will the marginal cost of capital when the funds exceeds the amount calculated in (C), assuming new equity is issued at ` 20 per share?

Illu 9 - Determine the cost of capital of Best Luck Limited using the book value (BV) and market value (MV) weights from the following information:

Sources	Book Value	Market Value
	(`)	(`)
Equity shares	1,20,00,000	2,00,00,000
Retained earnings	30,00,000	—
Debentures	36,00,000	33,75,000
Preference shares	9,00,000	10,40,000

Additional information :

I. Equity : Equity shares are quoted at `130 per share and a new issue priced at ` 125 per share will be fully subscribed; floatation costs will be ` 5 per share.

II. Dividend : During the previous 5 years, dividends have steadily increased from ` 10.60 to ` 14.19 per share. Dividend at the end of the current year is expected to be ` 15 per share.

III. Preference shares : 15% Preference shares with face value of ` 100 would realise ` 105 per share.

IV. Debentures : The company proposes to issue 11-year 15% debentures but the yield on debentures of similar maturity and risk class is 16% ; floatation cost is 2%.

V. Tax : Corporate tax rate is 35%. Ignore dividend tax.

Illu 10 - ABC Company's equity share is quoted in the market at ` 25 per share currently. The company pays a dividend of ` 2 per share and the investor's market expects a growth rate of 6% per year.

You are required to:

(i) CALCULATE the company's cost of equity capital.

(ii) If the company issues 10% debentures of face value of ` 100 each and realises ` 96 per debenture while the debentures are redeemable after 12 years at a premium of 12%, CALCULATE cost of debenture using YTM?

Assume Tax Rate to be 50%.

Illu 11 - A company issues:

- 15% convertible debentures of ` 100 each at par with a maturity periodof 6 years. On maturity, each debenture will be converted into 2 equity shares of the company. The risk-free rate of return is 10%, market risk premium is 18% and beta of the company is 1.25. The company has paid dividend of ` 12.76 per share. Five years ago, it paid dividend of ` 10 per share. Flotation cost is 5% of issue amount.
- 5% preference shares of ` 100 each at premium of 10%. These shares are redeemable after 10 years at par. Flotation cost is 6% of issue amount.

Assuming corporate tax rate is 40%.

(i) CALCULATE the cost of convertible debentures using the approximation method.

(ii) Use YTM method to CALCULATE cost of preference shares.

Year	1	2	3	4	5	6	7	8	9	10
$PVIF_{0.03, t}$	0.971	0.943	0.915	0.888	0.863	0.837	0.813	0.789	0.766	0.744
$PVIF_{0.05, t}$	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645	0.614
$PVIFA_{0.03, t}$	0.971	1.913	2.829	3.717	4.580	5.417	6.230	7.020	7.786	8.530
$PVIFA_{0.05, t}$	0.952	1.859	2.723	3.546	4.329	5.076	5.786	6.463	7.108	7.722

Interest rate	1%	2%	3%	4%	5%	6%	7%	8%	9%
$FVIF_{i, 5}$	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539
$FVIF_{i, 6}$	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677
$FVIF_{i, 7}$	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828

CAPITAL STRUCTURE

FINANCING DECISIONS - EQUITY VS DEBT

Particulars	Alt 1	Alt 2	Alt 3
EBIT			
Less: Interest [Debentures x Interest rate]			
EBT			
Less: Tax [EBT X Tax Rate]			
EAT			
Less: Preference Dividend [Pref Share X Pref Div rate]			
EAFESH			
No. of equity shares			
EPS (EAFESH / No of equity shares)			

Note:

The company should opt for that plan where EPS is maximum.

1) Interest rate will be calculated on slab basis -

Ex:- Debt < 500000 , Int rate is 10 %

500000 – 10,00,000 , Int rate is 12 %

>10,00,000 , Int rate 14 %

If debentures is 12,00,000,

Interest =

2) No. of equity share = Equity Share Capital / Issue Price per share

INDIFFERENCE POINT AND FINANCIAL BEP

INDIFFERENCE POINT - EBIT at which EPS under 2 alternatives becomes same.

EPS = $\frac{(EBIT - Interest) \times (1-t) - PD}{\text{No. of equity shares}}$

We will assume EBIT as "x" & put all other values and solve both the equation.

FINANCIAL BEP - EBIT at which EPS will be *NIL.*

Financial BEP = Interest + $\frac{\text{Preference Dividend}}{1-t}$

CAPITAL STRUCTURE THEORY

VALUE OF FIRM = $\frac{EBIT}{K_0}$

VALUE OF DEBT = $\frac{Interest}{Kd}$

VALUE OF EQUITY = $\frac{EBIT - Interest}{Ke}$

NET INCOME APPROACH

NET OPERATING INCOME APPROACH

TRADITIONAL APPROACH

MODIGLIANI MILLER APPROACH

MM I

$K_{el} = K_{eu} + (K_{eu} – K_d) \times D/E$

K_{eu} = cost of equity of unleveraged firm (Overall cost of capital i.e. K_o)

K_{el} = cost of capital of leveraged firm

K_d – cost of debt.

Note-

Unleveraged firm :- when ONLY EQUITY EXISTS (NO DEBT)

Leveraged firm :- when EQUITY & DEBT BOTH EXIST.

MM II

Value of unleveraged firm = $\frac{EBIT\ (1 – t)}{k_0}$

Value of leveraged firm = Value of unleveraged firm + (Debentures x tax rate)

Illu 1 - The Modern Chemical Ltd requires `25,00,000 for a new plant. This plant is expected to yield earnings before interest and taxes of ` 5,00,000. While deciding about the financial plan, the company consider the objective of maximizing earnings per share. It has 3 alternatives to finance the project by raising debt of ` 2,50,000 or ` 10,00,000 or ` 15,00,000 and the balance, in each case, by issuing equity shares. The company's shares is currently selling at ` 150 but is expected to decline to ` 125 in case the funds are borrowed in excess of ` 10 lakhs. The funds can be borrowed at the rate of 10% upto ` 2,50,000 at 15% over ` 2,50,000 and up-to ` 10 lakhs and at 20% over ` 10 lakhs. The tax rate applicable to the company is 50%. Which form of financing should the company choose?

Illu 2 - The management of Z Company Ltd wants to raise its funds from market to meet out the financial demands of its long term projects. The company has various combination of proposals to raise its funds. You are given the following proposals of company.

(1) Proposals	%of equity	% of debts	% of preference share
P	100	---	---
Q	50	50	---
R	50	---	50

(1) Cost of debt – 10%

Cost of preference shares – 10%

(2) Tax rate – 50%

(3) Equity shares of the face value of ` 10 each will be issued at a premium of ` 10 per share.

(4) Total investment to be raised ` 40,00,000.

(5) Expected earning before interest and tax ` 18,00,000.

From the above proposals the management wants to take advice from you for appropriate plan after computing the following:

(i) Earning per share

(ii) Financial break-even-point

(iii) Compute the EBIT range among the plans for indifference .Also indicate if any of the plans dominate.

Illu 3 - The following data are presented in respect of Quality Automation Ltd.:

Particulars	Amount (`)
Profit before interest and tax	52,00,000
Less: Interest on debentures @ 12%	12,00,000
Profit before tax	40,00,000
Less: Income tax @ 50%	20,00,000
Profit After tax	20,00,000
No. of equity shares (of ` 10 each)	8,00,000
EPS	2.5
PE Ratio	10
Market price per share	25

The company is planning to start a new project requiring a total capital outlay of ` 40,00,000. You are informed that a debt equity ratio (D/D+E) higher than 35%, pushes the Ke up to 12.5%, means reducing the PE ratio to 8 and rises the interest rate on additional amount borrowed to 14%. FIND OUT the probable price of share if:

(i) the additional funds are raised as a loan.

(ii) the amount is raised by issuing equity shares. (Note: Retained earnings of the company is ` 1.2 crore)

Illu 4 - Rupa Ltd.'s EBIT is ` 5,00,000. The company has 10%, ` 20 lakh debentures. The equity capitalization rate i.e. Ke is 16%.

You are required to calculate:

(i) Market value of equity and value of firm

(ii) Overall cost of capital.

Illu 5 - Z Ltd. operating income (before interest and tax) is ` 9,00,000 .The firm's cost of debts is 10 percent and current firm employs ` 30,00,000 of debts. The overall cost of capital of firm is 12 percent. Required: calculate cost of equity.

Illu 6 - Alpha Limited and Beta Limited are identical except for capital structures. Alpha Ltd. has 50 per cent debt and 50 per cent equity, whereas Beta Ltd. has 20 per cent debt and 80 percent equity.(All percentages are in market-value terms).The borrowing rate for both companies is 8 percent in an tax world, and capital markets are assumed to be perfect.

i) If you own 2 per cent of the shares of Alpha Ltd., what is your return if the company has net operating income of ` 3,60,000 and the overall capitalisation rate of the company, Ko is 18 per cent? (ii) What is the implied required rate of return on equity?

(b) Beta Ltd. has the same net operating in come as Alpha Ltd. (i) What is the implied required equity return of Beta Ltd. ? (ii) Why does it differ from that of Alpha Ltd. ?

Illu 7 - Kalyanam Ltd. has an operating profit of ₹ 34,50,000 and has employed Debt which gives total Interest Charge of ₹ 7,50,000. The firm has an existing Cost of Equity and Cost of Debt as 16% and 8% respectively. The firm has a new proposal before it, which requires funds of ₹ 75 Lakhs and is expected to bring an additional profit of ₹ 14,25,000. To finance the proposal, the firm is expecting to issue an additional debt at 8% and will not be issuing any new equity shares in the market. Assume no tax culture.

You are required to CALCULATE the Weighted Average Cost of Capital (WACC) of Kalyanam Ltd.:

(i) Before the new Proposal (ii) After the new Proposal.

Illu 8 - Blue Ltd., an all equity financed company is considering the repurchase of ` 275 lakhs equity shares and to replace it with 15% debentures of the same amount. Current market value of the company is ` 1,750 lakhs with its cost of capital of 20%. The company's Earnings before Interest and Taxes (EBIT) are expected to remain constant in future years. The company also has a policy of distributing its entire earnings as dividend.

Assuming the corporate tax rate as 30%, you are required to CALCULATE the impact on the following on account of the change in the capital structure as per Modigliani and Miller (MM) Approach:

(i) Market value of the company (ii) Overall Cost of capital (iii) Cost of equity

DIVIDEND POLICY

WALTER MODEL

MPS = D + (E-D) X $\frac{r}{ke}$
$\frac{}{ke}$

"D" denotes dividend/share = $\frac{\text{Total equity dividend}}{\text{No.of equity shares}}$

"E' denotes earning /share= $\frac{\text{EAFESH}}{\text{No.of equity shares}}$

"r" denotes return on investment/internal rate of return.

"ke" denotes cost of equity/cost of capital/equity capitalisation rate.

Note

1) if "r" is not given in the problem ,we will calculate r as

r = Earnings/Total capital x 100.

2) If ke is not given in the problem, we will calculate

ke= 1/ PE RATIO.

ANALYSIS :-

r > ke – Optimum payout ratio 0 %

r < ke - Optimum payout ratio 100 %

r = ke – Indifference between return & retained earnings.

GORDON MODEL

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

D_1 denotes expected dividend at the end of current year.

K_e denotes cost of equity/cost of capital/equity capitalisation rate.

g denotes growth rate.

NOTE

$D_1 = D_0 X (1 + g)$

$g = b \times r$

b = retention ratio, r = return on investment/internal rate of return

Dividend payout ratio + retention ratio = 100 %

MM MODEL

STEP -1

Calculate market price

$$P_0 = \frac{D_1 + P_1}{1 + K_e}$$

We need to calculate P1 where D_1, P_0 & K_e will be given in the problem both when dividend is declared & not declared.

Step-2

Calculate number of new equity shares to be issued

Particulars	Dividend declared	Dividend not declared
EAFESH	XXX	XXX
(-) EQUITY DIV.	(XX)	----
RETAINED EARNINGS	XXX	XXX
FRESH ISSUE OF EQUITY SHARE CAPITAL (A)	XXX	XXX
(INVESTMENT REQUIRED – RETAINED EARNINGS)		
P_1 (B)	XX	XX
NO. OF EQUITY SHARES (A/B)	XX	XX
(WILL BE IN DECIMALS)		

VALUE OF FIRM = (NO. OF EQUITY SHARES + NEW EQUITY SHARES) X P_1

Illu 1 - The following information is supplied to you:

Total Earnings	2,00,000
No. of equity shares (of ` 100 each)	20,000
Dividend paid	1,50,000
Price/Earning ratio	12.5

(i) Ascertain whether the company is the following an optimal dividend policy.

(ii) Find out what should be the P/E ratio at which the dividend policy will have no effect on the value of the share.

(iii) Will your decision change, if the P/E ratio is 8 instead of 12.5?

Illu 2 - The following information is given for QB Ltd.

Earning per share	`12
Dividend per share	`3
Cost of capital	18%
Internal Rate of Return on investment	22%
Retention Ratio	75%

Calculate the market price per share using

(i) Gordon's formula

(ii) Walter's formula

Illu 3 - ABC Ltd. has 50,000 outstanding shares. The current market price per share is ` 100 each. It hopes to make a net income of ` 5,00,000 at the end of current year. The Company's Board is considering a dividend of ` 5 per share at the end of current financial year. The company needs to raise `10,00,000 for an approved investment expenditure. The company belongs to a risk class for which the capitalization rate is 10%. Show, how the M-M approach affects the value of firm if the dividends are paid or not paid.

Illu 4 - Given the last year's dividend is ` 9.80, speed of adjustment of 45%, target payout ratio is 60% and EPS for current year ` 20. COMPUTE current year's dividend using Linter's model.

Illu 5 - A&R Ltd. is a large-cap multinational company listed in BSE in India with a face value of ` 100 per share. The company is expected to grow @ 15% p.a. for next four years then 5% for an indefinite period. The shareholders expect 20% return on their share investments. Company paid ` 120 as dividend per share for the FY 2020-21. The shares of the company traded at an average price of ` 3,122 on last day. FIND out the intrinsic value of per share and state whether shares are overpriced or underpriced.

Illu 6 - In May 2020, shares of RT Ltd. was sold for ` 1,460 per share. A long term earnings growth rate of 7.5% is anticipated. RT Ltd. is expected to pay dividend of ` 20 per share.

(i) CALCULATErate of return an investor can expecttoearn assuming that dividends are expected to grow along with earnings at 7.5% per year in perpetuity?

(ii) It is expected that RT Ltd. will earn about 10% on retained earnings and shall retain 60% of earnings. In this case, STATE whether, there would be any change in growth rate and cost of Equity?

Illu 7 - Mr H is currently holding 1,00,000 shares of HM ltd, and currently the share of HM ltd is trading on Bombay Stock Exchange at ` 50 per share. Mr A have a policy to re-invest the amount of any dividend received into the shared back again of HM ltd. If HM ltd has declared a dividend of ` 10 per share, please determine the no of shares that Mr A would hold after he re-invests dividend in shares of HM ltd.

Illu 8 -

. Following information is given pertaining to DG ltd,

No of shares outstanding	1 lakh shares
Earnings Per share	25 per share
P/E Ratio	20
Book Value per share	400 per share

If company decides to repurchase 5,000 shares, at the prevailing market price,what is the resulting book value per share after repurchasing.

CAPITAL BUDGETING

TECHNIQUES OF CAPITAL BUDGETING

MODERN TECHNIQUES

- NPV

- PI

- IRR

- DISCOUNTED PAYBACK

TRADITIONAL TECHNIQUES

- PAYBACK

- ARR

DISCOUNTING TECHIQUES

NET PRESENT VALUE

NPV = PV OF CASH INFLOW – PV OF CASH OUTFLOW

DECISION CRITERIA-

A. SINGLE PROJECT

NPV > 0

NPV < 0

NPV = 0

B. TWO OR MORE PROJECTS

MUTUALLY EXCLUSIVE PROJECTS	COMPLEMENTARY PROJECTS	INDEPENDENT PROJECTS

PRESENT VALUE FACTORS

DESIRED RATE OF RETURN, MINUMUM REQUIRED RATE OF RETURN, CUT OFF RATE, HURDLE RATE, THRESHOLD RATE, COST OF CAPITAL

PROFITABILITY INDEX / DESIRABILITY FACTOR

PI = PV OF CASH INFLOW
PV OF CASH OUTFLOW

DECISION CRITERIA-

PI > 1

PI < 1

PI = 1

CASHFLOWS OF CAPITAL BUDGETING

CASH OUTFLOW

- CAPITAL EXPENDITURE

- INVESTMENT IN WORKING CAPITAL

(T=0)

CASH INFLOW

REVENUE CASH INFLOW

TERMINAL CASH INFLOW

- SALE OF SCRAP

- RELEASE OF W. CAPITAL

REVENUE CASH INFLOWS

ILLU – SALE	**RS 1,00,000**
MATERIAL COST	**RS 35,000**
WAGES COST	**RS 25,000**
OTHER CASH EXPENSES	**RS 5,000**
DEPRECIATION	**RS 15,000**
TAX	**30%**

CALCULATE REVENUE CASH INFLOW

ROLE OF DEPRECIATION

- **RELEVANCE:**

- **CALCULATION:**

- **METHODS:**

- **COMPANIES ACT VS INCOME TAX RULES:**

ROLE OF TAXATION IN CAPITAL BUDGETING

- **TAX RATE NOT GIVEN:**

- **TAX ON CAPITAL GAIN / TAX SHIELD ON CAPITAL LOSS**

ILLU – FIXED ASSET RS 5,00,000. DEPRECIATION – 10% P.A. ON WDV BASIS.

SCRAP REALISATION AFTER 5 YEARS – (A) RS 3,50,000 (B) RS 1,00,000

TAX RATE – 30% . CALCULATE TERMINAL CASH INFLOW

- **CARRY FORWARD AND SET OFF OF LOSSES**

ILLUSTRATION	YR 1	YR 2	YR 3
EBT	(20,000)	(10,000)	40,000
TAX @ 30%			
EAT			

- **TREATMENT OF SUBSIDY**

TREATMENT:

DEPRECIATION:

PAYBACK PERIOD

ILLUSTRATION	PERIOD	A	B
CASH OUTFLOW	0	100000	100000
CASH INFLOW	1	60000	20000
	2	40000	30000
	3	2000	20000
	4	10	50000

DISCOUNTED PAYBACK PERIOD

ILLUSTRATION –

	TIME	PV FACTOR @ 10%	AMOUNT		PRESENT VALUE	
			A	B	A	B
OUTFLOW	0		5	5		
INFLOW	1		1.5	0.5		
	2		2	1.5		
	3		2.5	2		
	4		1.5	3		
	5		1	2		

ACCOUNTING / AVERAGE RATE OF RETURN

ARR = AVERAGE NET PROFIT / EAT
INITIAL INVESTMENT

ILLUSTRATION –

	TIME	AMOUNT	
		A	B
OUTFLOW	0	5	5
INFLOW	1	1.5	0.5
	2	2	1.5
	3	2.5	2
	4	1.5	3
	5	1	2

INTERNAL RATE OF RETURN

An investment of ` 1,36,000 yields the following cash inflows (profits before depreciation but after tax). Determine internal rate of return.

Year	`
1	30,000
2	40,000
3	60,000
4	30,000
5	20,000
	1,80,000

SPECIAL SITUATIONS

A. PROJECTS HAVING UNEQUAL LIFE

	A	B
CASH OUTFLOW	850000	650000
USEFUL LIFE	3 YEARS	2 YEARS
ANNUITY FACTOR @ 12%	2.4019	1.6901

	A	B
NPV	85000	120000
USEFUL LIFE	5 YEARS	6 YEARS
ANNUITY FACTOR @ 12%	3.605	4.112

B. CAPITAL RATIONING

AVAILABLE FUND – 10 LAKH

	A	B	C	D	E
CASH OUTFLOW	1	2	4	8	5
PV OF CASH INFLOW	10	16	20	32	30

C. REPLACEMENT DECISION

CASH OUTFLOW	CASH INFLOW
COST OF NEW MACHINE	1. REVENUE CASH INFLOW
LESS: PROCEEDS FROM SALE	(INCREASE IN SALES /
OF OLD MACHINE	DECREASE IN VARIABLE COST
(TIME PERIOD – 0)	NET OF TAXES)
	2. INCREASE IN SCRAP
	REALISATION

D. RELEVANT COST

SUNK COST

OPPORTUNITY COST

OUT OF POCKET COST

Illu 1 - Consider the following mutually exclusive projects:

Projects	C_0	C_1	C_2	C_3	C_4
A	-10,000	6,000	2,000	2,000	12,000
B	-10,000	2,500	2,500	5,000	7,500
C	-3,500	1,500	2,500	500	5,000
D	-3,000	0	0	3,000	6,000

(1) Calculate the payback period for each project.

(2) If the standard payback period is 2 years, which project will you select? Will your answer differ, if standard payback period is 3 years.

(3) If the cost of capital is 10%, compute the discounted payback period for each project. Which project will you recommend, if standard discounted payback period is 1) 2 year; 2) 3 years?

(4) Compute NPV of each project. Which project will you recommend on the NPV criterion? The cost of capital is 10%. What will be appropriate choice criteria in this case? The PV factor at 10% are:

Year	1	2	3	4
PV factor are 10%	0.9091	0.8264	0.7513	0.6830

Illu 2 - Given below are the data on a capital project M:

Annual cost saving	60,000
Useful life	4 years
Internal rate of return	15%
Profitability index	1.064
Salvage value	0

You are required to calculate for this project M:

(i) Cost of project

(ii) Payback period

(iii) Cost of capital

(iv) Net present value.

Given the following table of discount factors:

Discount factor	15%	14%	13%	12%
1 year	0.869	0.877	0.885	0.893
2 years	0.756	0.769	0.783	0.797
3 years	0.658	0.675	0.693	0.712
4years	0.572	0.592	0.613	0.636
Total	2.855	2.913	2.974	3.038

Illu 3 - The management of P Limited is considering selecting a machine out of the two mutually exclusive machines. The company's cost of capital is 12 percent and corporate tax rate for the company is 30 percent. Details of the machines are as follows:

	Machine-1	Machine-2
Cost of machine	` 10,00,000	` 15,00,000
Expected life	5 years	6 years
Annual income before tax and depreciation	` 3,45,000	` 4,55,000

Depreciation is to be charged on straight line basisYou are required to:

(i) Calculate the discounted pay-back period and net present value for each machine.

(ii) Advise the management of P Limited as to which machine they should take up.

Year	1	2	3	4	5	6
At 12%	.893	.797	.712	.636	.567	.507

Illu 4 - WX Ltd. has a machine which has been in operation for 3 years. Its remaining estimated useful life is 8 years with no salvage value in the end. Its current value is ` 2,00,000. The company is considering a proposal to purchase a new model of machine to replace the existing machine. The relevant information are as follows:

	Existing Machine	New Machine
Cost of machine	3,30,000	10,00,000
Estimated life	11 years	8 years
Salvage value	Nil	40,000
Annual output	30,000 units	75,000 units
Selling price per unit	15	15
Annual operating hours	3,000	3,000
Material cost per unit	4	4
Labour cost per hour	40	70
Indirect cash cost per annum	50,000	65,000

The company follows the straight line method of depreciation. The corporate tax rate is 30% and WX Ltd., does not make any investment, if it yields less than 12%. Present value of annuity of `1 at 12% rate of discount for 8 years is 4.968. Present value of `1 at 12% rate of discount, received at the end of 8th year is 0.404. Ignore capital gain tax. Advice WX Ltd. whether the existing machine should be replaced or not.

Illu 5 - XYZ Ltd. is planning to introduce a new product with a project life of 8 years. The project is to be setup in Special Economic Zone (SEZ), qualifies for one time (at starting) tax free subsidy from the State Government of ` 25,00,000 on capital investment. Initial equipment cost will be ` 1.75 crore. Additional equipment cost ` 12,50,000 will be purchased at the end of the third year from the cash inflow of this year. At the end of 8 years the original equipment will have no resale value, but additional equipment can be sold for ` 1,25,000 .A working capital of ` 20,00,000 will be needed and it will be released at the end of eight year. The project will be financed with sufficient amount of equity capital. The sales volumes over eight years have been estimated as follows:

Year	1	2	3	4 & 5	6 - 8
Units	72,000	1,08,000	2,60,000	2,70,000	1,80,000

sales price of ` 120 per unit is expected and variable expenses will amount to 60% of sales revenue. Fixed cash operating costs will amount ` 18,00,000 per year. The company is subject to 30 percent tax rate and consider 12 percent to be an appropriate after tax cost of capital for this project. The company follows straight line method of depreciation. Required: Calculate the net present value of the project and advise the management to take appropriate decision.

Note: The PV factors at 12% are :

Year	1	2	3	4	5	6	7	8
Units	.893	0797	.712	.636	.567	.507	.452	.404

Illu 6 - A large profit making company is considering the installation of a machine to process the waste produced by one of its existing manufacturing process to be converted into a marketable product. At present the waste is removed by a contractor for disposal on payment by the company of ` 50 lakhs per annum for the next four years. The compensation of ` 30 lakhs to contractor will be paid before the processing operations starts.

This compensation is not allowed as deduction for tax purposes. The machine required for carrying out the processing will cost ` 200 lakhs to be financed by a loan repayable in 4 equal installments commencing from the end of the year. The interest rate is 16% per annum. At the end of the 4th year, the machine can be sold for ` 20 lakhs and the cost of dismantling and removal will be` 15 lakhs. Sale and direct costs of the product from waste processing for 4 years are estimated as under:-

(` in lakhs)

Year	1	2	3	4
Sales	322	322	418	418
Material consumption	30	40	85	100
Wages	75	75	85	85
Other expenses	40	45	54	70
Factory overheads	55	60	110	145
Depreciation (as per income tax rules)	50	38	28	21

Initial stock of material required before commencement of the processing operation ` 20 lakhs at the start of year 1. The stock levels of materials to be maintained at the end of year 1, 2 and 3 will be ` 55 lakhs and the stock at the end of year 4 will be nil. The storage of materials will utilize space which would otherwise have been rented out for ` 10 lakhs per annum.

Labour costs include wages of 40 workers, whose transfer to this process will reduce idle time payments of ` 15 lakhs in year 1 and ` 10 lakhs in year 2. Factory overheads include apportionment of general factory overheads except to the extent of insurance charges of ` 30 lakhs per annum payable on this venture. The company's tax rate is 50%. Present value factors for four years are as under:-

Year	1	2	3	4
Present value factor	0.870	0.756	0.658	0.572

Advise the management on the desirability of installing the machine for processing the waste. All calculation should form part of the answer:

Illu 7 - HMR Ltd. is considering replacing a manually operated old machine with a fully automatic new machine. The old machine had been fully depreciated for tax purpose but has a book value of ` 2,40,000 on 31st March 2021. The machine has begun causing problems with breakdowns and it cannot fetch more than ` 30,000 if sold in the market at present. It will have no realizable value after 10 years. The company has been offered ` 1,00,000 for the old machine as a trade in on the new machine which has a price (before allowance for trade in) of ` 4,50,000. The expected life of new machine is 10 years with salvage value of ` 35,000.

Further, the company follows straight line depreciation method but for tax purpose, written down value method depreciation @ 7.5% is allowed taking that this is the only machine in the block of assets.

Given below are the expected sales and costs from both old and new machine:

	Old machine (`)	New machine (`)
Sales	8,10,000	8,10,000
Material cost	1,80,000	1,26,250
Labour cost	1,35,000	1,10,000
Variable overhead	56,250	47,500
Fixed overhead	90,000	97,500
Depreciation	24,000	41,500
PBT	3,24,750	3,87,250
Tax @ 30%	97,425	1,16,175
PAT	2,27,325	2,71,075

From the above information, ANALYSE whether the old machine should be replaced or not if required rate of return is 10%? Ignore capital gain tax.

Illu 8 - XYZ Ltd. is presently all equity financed. The directors of the company have been evaluating investment in a project which will require ` 270 lakhs capital expenditure on new machinery. They expect the capital investment to provide annual cash flows of ` 42 lakhs indefinitely which is net of all tax adjustments. The discount rate which it applies to such investment decisions is 14% net.

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

The current annual gross rate of interest required by the market on corporate undated debt of similar risk is 10%. The after tax costs of issue are expected to be ` 10 lakhs. Company's tax rate is 30%.

(i) Calculate the adjusted present value of the investment,

(ii) Calculate the adjusted discount rate and

(iii) Explain the circumstances under which this adjusted discount rate may be used to evaluate future investments.

Illu 9 - Manoranjan Ltd is a News broadcasting channel having its broadcasting Centre in Mumbai. There are total 200 employees in the organisation including top management. As a part of employee benefit expenses, the company serves tea or coffee to its employees, which is outsourced from a third -party.

The company offers tea or coffee three times a day to each of its employees. 120 employees prefer tea all three times, 40 employees prefer coffee all three times and remaining prefer tea only once in a day. The third-party charges ` 10 for each cup of tea and `15 for each cup of coffee. The company works for 200 days in a year.

Looking at the substantial amount of expenditure on tea and coffee, the finance department has proposed to the management an installation of a master tea and coffee vending machine which will cost ` 10,00,000 with a useful life of five years. Upon purchasing the machine, the company will have to enter into an annual maintenance contract with the vendor, which will require a payment of ` 75,000 every year. The machine would require electricity consumption of 500 units p.m. and current incremental cost of electricity for the company is ` 12 per unit. Apart from these running costs, the company will have to incur the following consumables expenditure also:

(1) Packets of Coffee beans at a cost of ` 90 per packet.

(2) Packet of tea powder at a cost of ` 70 per packet.

(3) Sugar at a cost of ` 50 per Kg.

(4) Milk at a cost of ` 50 per litre.

(5) Paper cup at a cost of 20 paise per cup.

Each packet of coffee beans would produce 200 cups of coffee and same goes for tea powder packet. Each cup of tea or coffee would consist of 10g of sugar on an average and 100 ml of milk.

The company anticipate that due to ready availability of tea and coffee through vending machines its employees would end up consuming more tea and coffee. It estimates that the consumption will increase by on an average 20% for all class of employees. Also, the paper cups consumption will be 10% more than the actual cups served due to leakages in them.

The company is in the 25% tax bracket and has a current cost of capital at 12% per annum. Straight line method of depreciation is allowed for the purpose of taxation. You as a financial consultant is required to ADVISE on the feasibility of acquiring the vending machine.

PV factors @ 12%:

Year	**1**	**2**	**3**	**4**	**5**
PVF	0.8929	0.7972	0.7118	0.6355	0.5674

Illu 10 - Stand Ltd. is contemplating replacement of one of its machines which has become outdated and inefficient. Its financial manager has prepared a report outlining two possible replacement machines. The details of each machine are as follows:

	Machine 1	**Machine 2**
Initial investment	` 12,00,000	` 16,00,000
Estimated useful life	3 years	5 years
Residual value	` 1,20,000	` 1,00,000
Contribution per annum	` 11,60,000	` 12,00,000
Fixed maintenance costs per annum	` 40,000	` 80,000
Other fixed operating costs per annum	` 7,20,000	` 6,10,000

The maintenance costs are payable annually in advance. All other cash flows apart from the initial investment assumed to occur at the end of each year. Depreciation has been calculated by straight line method and has been included in other fixed operating costs. The expected cost of capital for this project is assumed as 12% p.a.

Which machine is more beneficial, using Annualized Equivalent Approach? Ignore tax.

Illu 11 - The General Manager of Merry Ltd. is considering the replacement of five-year-old equipment. The company has to incur excessive maintenance cost of the equipment. The equipment has zero written down value. It can be modernized at a cost of ` 1,40,000 enhancing its economic life to 5 years. The equipment could be sold for ` 30,000 after 5 years. The modernization would help in material handling and in reducing labour , maintenance & repairs costs.

The company has another alternative to buy a new machine at a cost of ` 3,50,000 with an economic life of 5 years and salvage value of ` 60,000. The new machine is expected to be more efficient in reducing costs of material handling, labour, maintenance & repairs, etc.

The annual cost are as follows:

	Existing Equipment(`)	**Modernization(`)**	**New Machine(`)**
Wages & Salaries	45,000	35,500	15,000
Supervision	20,000	10,000	7,000
Maintenance	25,000	5,000	2,500
Power	30,000	20,000	15,000
	1,20,000	70,500	39,500

Assuming tax rate of 50% and required rate of return of 10%, should the company modernize the equipment or buy a new machine?

PV factor at 10% are as follows:

Year	**1**	**2**	**3**	**4**	**5**
PV factor	0.909	0.826	0.751	0.683	0.621

Arbitrage Gain

Illu 1 - *Following data is available in respect of two companies having same business risk:*

Capital employed = ` 2,00,000, EBIT = ` 30,000 and K_e = 12.5%

Sources	***Levered Company (`)***	***Unlevered Company (`)***
Debt (@10%)	*1,00,000*	*Nil*
Equity	*1,00,000*	*2,00,000*

An investor is holding 15% shares in levered company. CALCULATE the increase in annual earnings of investor if he switches his holding from Levered to Unlevered company.

Illu 2 - Following data is available in respect of two companies having same business risk:Capital employed = ` 2,00,000, EBIT = ` 30,000

Sources	Levered Company (`)	Unlevered Company (`)
Debt (@10%)	1,00,000	Nil
Equity	1,00,000	2,00,000
K_e	20%	12.5%

An investor is holding 15% shares in Unlevered company. CALCULATE the increase in annual earnings of investor if he switches his holding from Unlevered to Levered Company.

Calculation of Intrinsic Value / Fair Value / Valuation of Securities

Qsn 1 - A&R Ltd. is a large-cap multinational company listed in BSE in India with a face value of ` 100 per share. The company is expected to grow @ 15% p.a. for next four years then 5% for an indefinite period. The shareholders expect 20% return on their share investments. Company paid ` 120 as dividend per share for the FY 2020-21. The shares of the company traded at an average price of ` 3,122 on last day. FIND out the intrinsic value of per share and state whether shares are overpriced or underpriced.

Qsn 2 - Vyom Limited, an IT conglomerate, is planning to take over Aryayash Limited, a startup company incorporated 2 years ago but holding a lot of prospects. To determine the buyout consideration, Vyom Limited has approached you as a Finance controller to estimate the fair value of the startup company today based on future earnings es□mates. Following details of the startup company are as below –

Expected Sales in the coming year are ` 25 lakhs with P/V ratio of 40%. The sales are expected to grow at a rate of 20% for the next 2 years, to 40% for another 2 years, 25% in the 6th year and thereafter cash flows will grow at a steady rate of 10%. Fixed cost for the upcoming year is expected to be 12 lakhs for the first two years, ` 10 lakhs thereafter. Loss in any year can be set-off only against the profits of the immediate next 2 years. Corporate taxes applicable are 25% & 20% to Vyom Limited & Aryayash Limited respectively.

Vyom Limited's desired rate of return is 15% & Cost of Capital of Aryayash Limited is 17%. As a finance controller, CALCULATE the Fair value of Aryayash Limited.

Qsn 3 - Mr. Anand is thinking of buying a Share at ` 500 whose Face Value per share is ` 100. He is expecting a bonus at the ratio 1 : 5 at the end of the fourth year. Annual expected dividend is 20% and the same rate is expected to be maintained on the expanded capital base.

He intends to sell the Shares at the end of seventh year at an expected price of ` 900 each. Incidental Expenses for purchase and sale of Shares are es□mated to be 5% of the Market

Price. Assuming a Discount rate of 12% per annum, COMPUTE the Net Present Value from the acquisition of the shares.